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ARCHITECTURE

THE ARCHITECT.

VOL. XLVI.

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THE ARCHITECT.

A WEEKLY

ILLUSTRATED JOURNAL

OF

ART,

CIVIL ENGINEERING,

AND

BUILDING.

"Languages become obsolete, but the language of Architecture endures for ever. The pages of history may be lost or destroyed, but who can for a moment admit the thought that time can obliterate, although he may deface her monuments? The pyramids and temples of Egypt are imperishable. The habits, the customs, the religion, the wants, the luxuries of man change with each century and with each clime, but for all and every new necessity and fresh desire Architecture amply provides."—T. L. DONALDSON.

VOL. XLVI.

JULY TO DECEMBER, 1891.

LONDON:

PUBLISHED AT 175 STRAND, W.C.

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THE WEEK.

THE application of Mr. W. ALLAN CARTER to be included among the creditors of the Edinburgh Exhibition Association has been successful. Mr. CARTER claimed the right to a dividend of 13*s.* 4*d.* in 1*l.* on a sum of 631*l.*, the unpaid balance of 1,600*l.* odd for professional services as architect. The liquidator refused to rank Mr. CARTER in terms of his claim, on the ground that he had not completed his work, and that he was bound to go over the claims made by the two contractors against the Exhibition. Mr. CARTER held that he had long ago completed his work to the Exhibition, by making up and sending to them states of the balances due to the contractors. That, however, was quite a different thing from advising the liquidator with regard to claims made against the Exhibition, for which he held he was entitled to remuneration from him if his services were desired. Lord STORMONTH DARLING said that Mr. CARTER had in no way failed in the duty which belonged to him as architect. On the contrary, he had steered very skilfully between the proper discharge of his duty as architect and the saving of his character for impartiality as arbiter if his services in that capacity should be afterwards invoked. Lord STORMONTH DARLING gave judgment in favour of the architect, with costs.

WE are proud of our national monuments, but that is no reason for holding ourselves up as a warning to posterity, or as an example of what is neither to be imitated nor admired. The monumental purposes of St. Paul's Cathedral and Westminster Abbey were not intended to serve the additional purpose of immortalising a generation that did not know its own mind, or of sanctifying the memory of those whom the Duke of ARGYLL would classify as belonging to the genus jelly-fish. Nothing, however, now seems destined to get beyond the stage of talk. The decoration of St. Paul's Cathedral has been accomplished already some half a dozen times in talk or on paper, but the only substantial work in evidence is seen month after month in the shape of scaffolding above the choir, put up for carrying out the ceiling decoration, but on which no workmen ever mount to work. The report of the Royal Commission on Westminster, which has just been issued, does not seem to promise that it will further any practical results. These matters, we must hope, may at any rate be dealt with in the twentieth century, if not in the nineteenth; along with such others as the housing of the Admiralty and War Offices, for instance, and also that of the County Council —if such a body be then in existence.

A PULPIT presented to Norwich Cathedral by the late Dean, Dr. GOULBURN, was inaugurated on Wednesday last week. The pulpit is of Caen stone. The design and all details, sculpture, &c., are by Messrs. R. H. CARPENTER and B. INGELOW, under whose supervision the work has been executed. Mr. CARPENTER made the presentation to the Vice-Dean on behalf of Dr. GOULBURN, who was unable to be present, and the Vice-Dean, in accepting the gift, referred briefly to the important works effected by Dr. GOULBURN at Norwich. Reviewing them, he had been perfectly amazed at the work done by the late Dean, either by his own inspiration, or by his own friends and mainly at his own cost. A cathedral had a wonderful facility for absorbing money, and the least work done was more costly than many could possibly conceive. Years ago the roof was covered with a thick yellow wash, which blotted out the ancient colouring and concealed the beauty and delicacy of the structure. That was removed at the cost of the late Dean. It was a work involving a great deal of mechanical difficulty. He also drew out with great care an elaborate and finely-illustrated work describing the bosses upon the roof, so that it was a revelation to most persons of the great beauty of the sculptures adorning them. The Reliquary Chapel was restored by him, and also the Jesus Chapel. When Dr. GOULBURN came to Norwich that chapel was in great disrepair, and he wished to show by its restoration what it was like in its earlier days. Dr. GOULBURN at his own expense laid bare in the gardens the foundations of the Norman lady chapel, and the Chapter hoped that it would be put into the heart of some one to finish the work so as to make again complete the original design. At one time the parishioners of the old parish of St. Mary in the Marsh met for worship in the chapel in the Palace grounds built by Bishop REYNOLDS, an arrangement which caused some inconvenience, whereupon Dean GOULBURN, at his own cost, liberally restored St. Luke's Chapel for their use. Another great work done by the late Dean was the restoration of the whole of the apse, with all its circumstantial details, when decayed work had to be replaced by substantial masonry. Among smaller works done by Dr. GOULBURN were the turret-stairs in the cloisters, the restoration of the vestries over the cloisters, repairs to the Erpingham Gate, providing choristers' desks and establishing the present vestry.

A STRANGE engineering feat is recorded to have taken place in San Diego County, in the extreme south of California. The work has been accomplished by nature and not by human agency. The correspondent of the *Standard*, telegraphing from New York, says:—"The phenomenon consists in the almost sudden formation of an inland sea. On Saturday a trickling of water was observed to damp the ground around the Salton Salt Works, and now it has expanded into a lake ten miles square and from 3 feet to 8 feet deep. Then at Indian Wells, sixty miles south of Salton, another new sea, forty miles square and from 3 feet to 5 feet deep, has been formed. It appears possible that these bodies of water may unite, and form a lake fifty miles long and 400 feet deep." The water is supposed to be derived from the Colorado river, and the correspondent adds:—"The so-called Colorado Desert, lying to the east of the new lake, resembles the bed of a dead sea. It has an area of three thousand miles, and lies 270 feet below the ocean level. Shells and other marine deposits abound. Engineers have often planned to make this area fertile by irrigation, after the manner of the Valley of the Nile, which would add two million acres to the State, but all their efforts so far have been in vain." It may be that some outlet has taken place in the marshy district, extending for some miles in the neighbourhood of Arizona city.

STUDIES OF SOME CHURCHES IN THE PROVINCES.—III.

[By a Correspondent.]

THE parish church of Buckland St. Mary, Somerset, is about five miles from Chard, and charmingly situated on the Blackdown range of hills. It was rebuilt to a new design by an eminent architect (now gone to his rest), on the site of an older church, about thirty-five years since. Everything was then done in the handsomest and most substantial manner, without stint. The walls are thick, the interior lined with ashlar stone, and all the windows (except two, which at the time of the writer's visit had diapered quarries) filled with painted glass containing figure-subjects. Though a small matter, it is worth mentioning that outside the south porch is a long iron scraper—long enough to accommodate no less than three people scraping their boots at the same time—and with a rail at a convenient height to serve as a stay. That rail is a capital thought, for it is awkward for a man to have one leg up and then perhaps be nearly set off his balance by someone entering the church accidentally pushing up against him. In the country, where many of the parishioners have to walk in winter some distance through muddy roads, a well-contrived scraper helps to keep the church clean and nice. There is not only a south porch but also a tower at the south-west angle of the nave, which forms another porch, having a west doorway and also an archway in its north wall leading into the church. It is groined in stone. Opposite the archway is a wide unencumbered space, where stands a handsome font raised on a platform, and with a lofty oak pyramidal canopy. The whole area of the nave and aisles is paved with tiles, except where there are fixed seats, which occur next the walls to the north and south aisles. And there are a few in the western part of the nave, where the aisles do not extend. These are light, skeleton-framed open oak benches, not fixed. The central passage is very broad, and wider still is the cross passage opposite the south porch. This roominess constitutes an enormous advantage to the interior of any church, giving it an appearance of great space. One notices it the more because of its rarity, for in too many churches the seats look as if they have been crammed, rammed and jammed into it! This beautiful building was erected at the expense of the late rector, the Rev. Edward Lance, to the memory of his wife, whose cenotaph, recessed in the north wall of the chancel, was exquisitely sculptured by Mr. Forsyth. Under a segmental pointed and moulded arch is the figure of the mother, on a low pedestal, holding a babe in her arms, with the lid of the tomb breaking, clearly representing the Last Resurrection, and showing that the two departed this life together—a pathetic story well told in stone. To the south of the chancel, nearly at the east end, are the lowly tombs, side by side, of the founder of the church and of his wife—only a Latin cross of marble and a curb of the same material round the grave, that is all. The doors of the church are always on the latch during the day. There is daily service at a quarter to nine o'clock in the morning, and the building is warmed during the winter daily, not on Sundays only. Would that such an excellent example was more frequently followed! though it must be admitted that in many parishes it would be impracticable on account of the cost.

On what was practically the first day of spring, about the middle of April, the bright sunshine and gentle west wind tempted the writer a little out of town for a half-holiday. It was not very far off, it is true—only to Croydon, which in another ten years will almost become a suburb of the great metropolis. For a considerable period he had cherished the idea of examining the noble church of St. Michael and All Angels in this ancient town, which, though modern, is the design of Mr. Pearson. The building stands well, on rising ground at the fork of two roads, and is therefore a prominent object from the lower part of the town. Though it possesses no tower or spire, it has a lofty *flèche*, covered with lead, placed over the "crossing," and also has those large square turrets at the east sides of the transept which are so characteristic of this master and so well treated by him. Most architects would elect for octagonal or circular turrets, which are easier to treat than those of square plan. Where the funds at the disposal of the architect are not stinted, and there is a substantial reason for such turrets, they become a very telling feature in ecclesiastical architecture. This church is of rather severe thirteenth-century character, stamped with that originality possessed by a modest few architects, whose work in the ages to come can never be mistaken by the competent student for that of the Middle Ages, though the bricks, the stone, the woodwork, the metalwork, &c., are instinct with the true Mediæval spirit—that spirit which scorns the commonplace, refuses to tamely copy, yet at the same time declines to wildly wander away into pathless fields where there is no light or guidance. The main material employed at St. Michael and All Angels is red brick, freestone being sparingly used; the windows are lancets of considerable length. The great height of the church, the lofty proportions of the clerestory and the unusually bold projection of the transepts all tend to produce a striking effect, notwithstanding the plainness, which plainness is enhanced by some "annexes" of the church being still incomplete. This really seems one of the most successful of Mr. Pearson's buildings, with its quietude, its sense of restrained striving against sensational effect, its harmony of proportion combined with great delicacy and refinement in the details. It need scarcely be said that the whole character of the work is thoroughly English, not foreign, though in its great height and in being vaulted throughout the designer may be said to have taken a leaf out of the Continental book. The minute serration in the ridge tiles is vastly superior to the more common up-and-down, fussy manner in which they are often tortured in shape. The aisle buttresses have only one long water-table, executed in brick, which is a more effective treatment than a series of lesser set-offs at different levels. The doors of the church are, of course, open, and the traveller on entering is surprised to find the building vaulted throughout, a rare occurrence in an English parish church, whether ancient or modern. The groining is in stock bricks with stone ribs. There is really nothing externally to tell the tale, no flying buttresses or apparent preparation, so very much in evidence in French examples. But the walls are massive, and the flying buttresses must be over the aisle vaulting, though, of course, rather low in position for their work. There is a west gallery, forming a structural part of the church, and carried on vaulting. The restraint of the architect is felt in such details as the extremely simple gratings to the channels of the hot-water pipes in the passages and in the very plain square red tile pavements without pattern. The processional path or ambulatory to the semicircular apse gives great effect to the interior. It also shows how very necessary it is for an apse to be vaulted, a wood ceiling or an open-timbered roof being nothing more than a modern incongruity. There is an effective, though most unobtrusive, little ornament, which is a favourite of Mr. Pearson—a small pearl introduced on the soffit of the bell of the moulded capitals to the nave arcade, in the same capitals where the dog-tooth is also used. There is another clever contrivance by which the architect gets over what often forms an awkwardness in circular capitals, so much so that the writer has known an eminent architect who preferred the square abacus, entirely for that reason. This is a little trefoil which bridges over the abacus where otherwise it would have been crushed by the projection of the square of the wall above. The manner in which the artificial lighting of the church is effected is to be commended. There are a double row of pendants to the nave, and the seven pendant oil lamps to the sanctuary are not set as usual, *i.e.* alternately up and down, but all to an arched imaginary line, the rise in the centre being inconsiderable.

At Chorley Wood, a little beyond Rickmansworth on the Metropolitan Railway Extension line, is a charmingly situated church, by Street, on the edge of a breezy common. From the appearance of the building, it seems to have been erected somewhat over a quarter of a century. Though the writer has examined the interior, which is obviously the most important part of a church, his remarks will be devoted to the exterior, for the simple reason that he has more to say about that on this occasion, pleasing as architecturally the structure is internally. The same remark about the buttresses can be made as at St. Michael and All Angels, Croydon, *i.e.* the good effect of the

long slopes of the water-tables, there being only two gradations, though each is much subdivided, with very delicate drips, the materials used in the building being flintwork and freestone, and not bricks, as in the previously mentioned example. There can be no more unmistakable sign of the hand of the well-informed architect than the proportion and general treatment of the set-offs to the buttresses, a simple matter as some might think. There is a curious feature, for a modern church, in the manner in which the vestry, on the north side, is attached to the chancel. There is not sufficient space for the stone weather-mould of the roof to quite clear the jambs of the nave window, and so a special contrivance has been devised to get over this, and the outer order is therefore stopped on each side of the vestry. If the latter had been built at a subsequent date to the rest of the church it could have been understood; but that apparently not being so, one wonders why the architect could not have shifted the nave windows two or three inches, about which there would seem to have been no difficulty. The simple serrated ridge tiles to the roofs of the nave and chancel, with more than ordinarily deep "wings," are quite in the manner of Street. This is a point of great importance, especially in a plain, simple church, for the deep wing, though costing little more than a shallow one, well repays the extra expense by its superior and handsome aspect. The flints are not squared, but are in small, irregular-shaped sizes, with the natural face everywhere knocked off. There are no stone bonding-courses externally, though there are a fair number of stone strings. One point in the arrangement of the step to the principal or north entrance is that it is brought forward into the porch about 18 inches. This is worth attention, for it not only has a good appearance, but also helps to prevent accidents. There are no summerstones anywhere to the gables, which necessarily makes the feet of the rafters more prominent in this situation than in most churches. At the same time this is far better than the enormously projecting "knee-stones" which are to be often seen, constituting a vain attempt to mask what there is no need to conceal. The writer in his own practice has been always particular to employ summerstones of slight projection, without endeavouring to entirely hide the overhanging eaves, the ends of which require but little attention to make them look "ship-shape." A tower stands at the west end of the nave, which has a spire covered with oak shingle, having a picturesque arrangement of spire-lights, with louvre-boards at its base, which tends to make the transition between the tower and the timber spire less abrupt than it often is. That is a point worth attention, so as to prevent the appearance of a harsh junction line suggestive of an "extinguisher." It ought not to be possible to allow the scoffer of architects to have an excuse for such observations which, recklessly as they are often made, sometimes contain more than a germ of the truth.

VILLAGE BUILDINGS.*

FEW spots in the country are now left unexplored. In the old coaching days persons knew something of the beauties of the land, but in these days, when cycles have come to the fore, people are familiar with the by-lanes as well as the highways. A book such as the one produced by Mr. Williams should find a place in every house in the kingdom, for it puts into adequate language what is felt by the majority as they scour the country. It would be just as cheap, they say, "to build something pretty instead of those glorified doll's houses." We will, however, let Mr. Williams speak for himself. He says:—

A thousand towns are breaking through their old boundaries, and a great army of so-called builders, like a swarm of locusts, is on the march devouring every green thing within its reach. The adjacent hills are being slowly covered with all manner of "Institutions, perched in ghastly affectation of architectural pomp," utterly ruining the outlook from every point of view. Nearly every large town has its Crystal Palace (the name is enough) or folly of some kind. There is no doubt that the Exhibition of '51, as a building, has exercised a most pernicious effect upon the general taste, by creating an unwholesome and vulgar desire for glass and glass houses, as seen everywhere in the modern shop-front and house.

Our villages, except in a few manufacturing and mining districts, although unaffected by some of the causes which are working these rapid transformations in the towns, are nevertheless subject to other influences that are gradually and surely changing their old character. Houses which naturally fall into decay are seldom replaced or repaired upon the old lines. The building of the cottage as our forefathers knew and practised it (the making of a simple, pleasant, and healthy dwelling, with sufficient accommodation for the requirements of the tenant, and in harmony with the natural surroundings), is in danger of becoming a lost art. Rarely do we see the reproduction in any form of an old cottage; and yet there are scattered over the country numerous really good examples, entirely convenient in arrangement, and beautiful in their simplicity and picturesqueness. Instinct with a right and natural treatment, these show how the most pleasing effects may be obtained without the sacrifice of comfort or convenience, and with no wasteful or unnecessary expenditure of labour or material. The builders drew upon that invaluable experience which in past ages men gathered not from books, but from long years of patient observation and varied work. Compelled in many cases to make the best of local materials, they became adepts at readily distinguishing between that which was good or bad, and of selecting that which was most suitable for each particular purpose. They made no slavish attempts at uniformity or machine-like accuracy, their chief aim being soundness of construction. Their brick or stonework may not always keep a rigid line, or the timbers display a surface of perfect smoothness; but the former are bonded with honest mortar, and the latter carefully chosen and securely framed together. The lack of absolute regularity and surface finish is more than compensated for by the honesty of construction and the cunning way in which unforeseen difficulties were met and overcome.

Chiddingstone, in Kent, is a charming and rare instance of an old English village, with its half-timbered houses and shops. Almost every county had its own special and peculiar treatment of its buildings, and to travellers through the country this is clearly visible.

In Surrey the old cottages are mostly built of timber framing to the upper part, with brick or stonework below. The framing was generally filled in with laths or wattle (a kind of hurdle) secured to the framing (and called by the old country builders wattle and dab), and plastered over between the timbers. There are a great many cottages built almost entirely of timber framing, with merely a low brick or stone plinth, in order to keep the timberwork clear of the ground, and it is astonishing, with ordinary care, how many generations, almost centuries, such buildings will last. Here, as in parts of Kent, Sussex and Hampshire, weather-tiling was often used on the upright outer wall-framing, as providing, no doubt, better protection against rough weather. These hanging tiles, as they are called, were made in various patterns, and mostly hung on the upper half of the wall, being the most exposed part. The colour was a bright red, and different to that of the roof-tiles. Who can ever forget the lovely drawings by that gifted artist, Mrs. Allingham, of these cottages with their little flower-gardens, redundant one had almost said, redolent with those old-fashioned and sweet-scented flowers—pictures full of beauty?

In Hertfordshire the cottages and farm buildings are often wholly built of timber-framing and tarred weather-boarding, with a plinth of brick or stone, and when the golden moss comes upon the red-tiled roof, the effect is most pleasing. In some instances, where cream-colour paint is used, an equally satisfactory effect is obtained in combination with tiles.

In Sussex the lower half was generally built of stone, and the upper half of timber-work, the roof being covered with local stone tiles or slabs, giving a most picturesque appearance, and when properly applied perfectly weather-proof. Of course this kind of roofing requires stronger timbers than slates or tiles, but the old builders generally put timbers strong enough to carry anything. The comparison between the old and new in this respect is very great, the modern roof-timbers, especially those to receive slates, looking at a distance more like matches. In some parts of Sussex, too, a good deal of black weather-boarding may be seen, used, no doubt, in districts where stone or bricks were much more expensive than timber.

In Devonshire and some of the adjacent counties the cottages are often built of what is called cobb (a special kind of earth and straw) brought to an even face, coloured mostly cream colour, and covered with red tiles, stone slates, or often with thatch. The somewhat irregular surface, and the absence of sharp angles, together with their lovely surroundings, are very charming, and it is said such houses are the coolest in summer and the warmest in winter. The stone cottages in some of the seaside places, like Clovelly, are very interesting from the way in which they seem to have been built, nestling as it were, upon the ledges of rock, one above the other, in the most irregular but picturesque manner. No doubt one by one the first cottages were naturally enough erected after a careful selection of the easiest place to build upon. These cottages

* *Sketches of Village Buildings*, from Designs by James Williams, Architect, with Notes. Richard Bentley & Son, London.

mostly settled the position of the subsequent village or town, and those following had to make the best of the remaining sites. If it could have been foreseen what large villages or towns would have arisen, possibly very different positions would have in many cases been chosen. It is well for the picturesqueness of our towns that this foreknowledge was impossible.

The construction and arrangement of every building, however simple, should be influenced by its site and surroundings. The site is a most important point, both as to aspect, convenience and picturesqueness ; and this, together with the use of the simple and natural building materials of the locality, have a good deal to do with the charming effect so often seen in connection with old buildings. In days of agricultural and general depression, the question often arises, how to build dwellings for the labouring classes so as to get any reasonable kind of interest for the outlay. Most people give it up as hopeless from that point of view ; but if a well-considered plan be adopted with the simplest and most economical construction (consistent always with solid work), a sufficient return ought to be made except in unusually expensive districts. This, too, should provide for a large living-room, a scullery, three bedrooms, and the necessary adjuncts, so that all may live in comfort and decency. In most cases where the building of cottages does not "pay," it is from want of proper management. In some instances, where such works are carried out by the "Estate," they can be done as well and at less cost by an outside contract.

Too often, with small and inexpensive buildings, the general appearance and effect are disregarded, and a site chosen where it is vainly supposed little will be seen. The result being a conspicuous and ugly object, entailing as much or more cost in planting out than would have been incurred in making a suitable place in the first instance. There is no building, however simple, but should be made presentable from every point of view, and this too without any kind of unnecessary ornament or cost. The use of ornament, for its own sake, rarely seems desirable, especially in cottage buildings. In such buildings internal comfort and convenience are often sacrificed to external show. The chief points to be considered are a suitable site, a well-arranged plan, and, above all, sound and plain work, carried out with the best available local labour and materials. Such were the little homesteads which a long-forgotten generation of craftsmen built up from the ground, slowly it may be, but soundly and well, as could only be done by honest men working with heart, head and hand.

Penshurst is a pleasing instance of a small village with its church close to the castle, picturesquely situated in an undulating country. There are a few old cottages remaining, and most of the interesting ones, and the features of the village, are comparatively new, but so charming in the general effect, and in the appearance of age, that they are often mistaken for old buildings. The proximity of the cottages to the church and castle, the quaint covered entrance through into the churchyard, the beautiful lodge and archway leading to the castle, all well backed with fine trees, the winding road down to the new but old-fashioned looking bridge, which crosses the stream, all combine to make a lovely piece of quiet landscape rarely to be met with now. Most of the works connected with the careful restoration of the castle and the new buildings generally were carried out for the present noble owner under the superintendence of the late Mr. George Devey, the accomplished architect and artist. No man ever more thoroughly appreciated and understood the essential characteristics of village buildings.

As another example of some particularly good cottages, those on the St. Alban's Court estate, near Canterbury, may be mentioned, whose owner is himself a gifted artist in every sense. These were mostly built many years ago, and where the grey and golden lichen has kindly grown on roof and walls, with their simple but pleasing outline, the effect is unusually satisfactory and picturesque. Such buildings are rarely to be met with in modern work, and to those interested in these matters they are well worth seeing. These, too, were erected from the designs of the late Mr. George Devey. They are built with a combination of red bricks and Kentish rag stone for the lower part, the latter dying off irregularly into the brickwork, as may be seen in many old examples. The various sizes and the proportions being carefully thought out, the larger stones at the bottom of the relative size, about twice in length to the height. These and many features of old work have been followed. Most of the buildings are now well covered with ivy, roses and creepers, and the result is in every way charming. How very different the feeling produced by most new buildings and model villages with their monotonous regularity, uniformity and general barrenness.



Village Club and Cottage attached.

To those who live in towns and long for a country life it forms a constant and ever-recurring diversion to picture a combination of lovely features collected by the memory and expanded by the imagination. The winding road, with ample turf on either side, the tall elms and shady walks in summer time, the distant spire amongst the trees, the straggling cottages, some by the roadside, some standing back with gardens full of flowers, and here and there a well-clipt yew. The village inn, with hanging sign and drinking-trough, and ample bays commanding the wide road, the covered archway leading to the stable yard, once merry with the sound of London coach. The old-fashioned inn, with all its faults, has always been an attractive and interesting place, particularly if it chanced to be on a main coaching road. It was, in fact, in coaching days like the hotel and railway station combined, and a welcome place indeed to weary travellers, busy and cheerful, with old and new faces constantly coming and going. There is no reason why, under proper regulations and restrictions, it should not still be a harmless, useful and pleasant place, minis-

tering to the real wants of travellers, with thorough cleanliness, instead of being merely a drinking-shop. The various little shops, the blacksmith's forge and village green, the school, the park and squire's house among the trees, are all features of an English village ; to which, perhaps, might now be added, with advantage to the village green, a level place for games, strong sheltered seats, outdoor gymnasium and swings, a simple covered shelter from the sun and rain, with clock and weather-cock, a fountain or a well, a walk all round, with avenue of trees (chestnuts and planes).

The pavement in the village streets of brick, well up above the road, planted with trees. A sure and constant pure water supply to each house, with a thorough drainage and sanitary system, free baths and laundry and washhouse attached. A separate school for boys and girls, with kitchen and workshops, where some simple trade or useful work could be taught, best suited to each child. A library and reading-room, and other requirements always suggesting themselves in course of time, to meet the needs and administer to the happiness and welfare of the people.

It will be a sorry day for England when the peaceful rural character of her churches and villages gives place to the urban character with all its attendant sweeping alterations and so-called improvements.

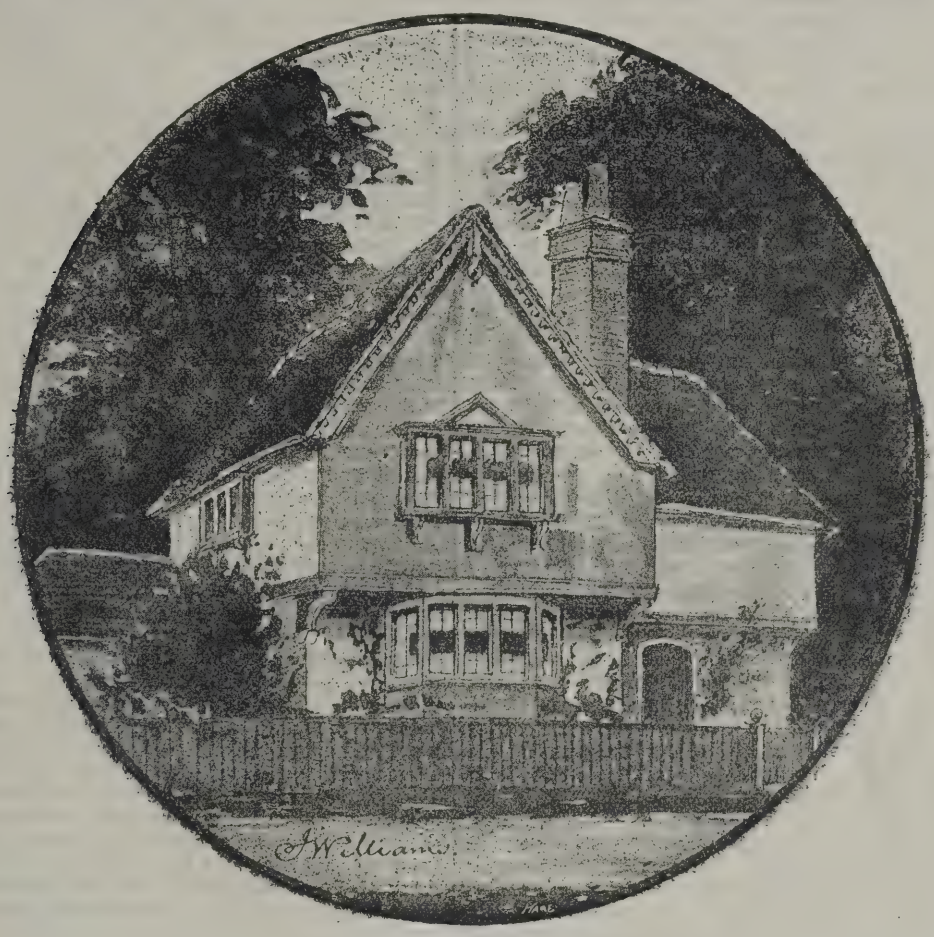
The extract we have made will be more than enough to show the character of the "Notes," which are of a most interesting character throughout, to the general public. But there is also a vast amount of information for students of architecture, information which it is well that the public should con over, seeing how great is the influence, however indirect it may be, that the owners of the smallest amount of property even may exercise on behalf of adding to or destroying beauty. All will agree with Mr. Williams that "Simplicity in both design and construction is the chief thing to be desired. Externally the real attraction and merit of all cottage building consists in the simple picturesque disposition of its parts, and internally in their convenient and economical arrangement. In old cottages the former seems to have been done in the most natural way without any kind of effort, almost as though the buildings had grown up like the trees and hedges about them—so completely suitable and fitted in every way do they appear, although often no inconsiderable part of their charm is due to the effect time brings." We reproduce two of the sketches, which number over thirty, though it is not possible to produce the warm rich tones of the brown sepia-like sketches, which have been faithfully reproduced by Messrs. Sprague & Co. The little work is an ornament to any table and of the sketch-book form. The whole of the letter-press has been printed in the same tint as the sketches. At any rate the book may as well find a place in private homes as in the office of the architect and the builder.

THE ROMAN WALL.

IN recommending the old Roman Wall as worthy of a visit during the holiday time, the *Scotsman* mentions Gilsland as the best centre of departure for short expeditions.

There have been various theories as to the builder or builders of the wall, but the testimony of the best authorities would point to the whole line of fortifications (including the wall with its northern fosse and southern vallum or earth-wall) having been constructed by Hadrian, and later repaired by Severus. In doing this, Hadrian evidently abandoned the earlier and more northern line of defence drawn by Agricola between the Firths of Forth and Clyde, in favour of this more southern rampart. As Appian tersely remarks, "The Romans have not cared to subdue the rest of Britain, the part which they hold being already almost useless to them." Indeed, when we look on the ruins of this massive structure and realise the labour of building it, and the necessary organisation required in keeping it defended, we are filled with wonder at the energy and greatness of the race who expended so much thought and work on the defence of one of the poorest and most outlying of their provinces. From the fact that every station and every mile-castle along the course of the wall has a gate opening to the north, the line of fortifications was clearly raised by the Romans with a view to protecting themselves against invasion from the Caledonians. The southern earth vallum would serve the double purpose of a second line of defence, and would also be a barricade against the attacks of the conquered but scarcely friendly British tribes. The ground enclosed between the two lines of fortification would serve as grazing ground for the cattle, of which there must have been considerable herds to supply the commissariat of so large an army.

Along the wall itself were the structures provided for the accommodation of the soldiers. These consisted of (*a*) stations, (*b*) mile-castles, (*c*) turrets. The stations or camps were situated at a distance of four miles from each other, and covered about five acres of ground. Several of them are in such good preservation that their construction is easily traceable without any great archæological skill. The ground plan lies before us—a



KEEPER'S LODGE.

book that he who runs may read. There are almost always four gateways—north, south, east and west. The wall is usually incorporated with the north wall of the camp, while the vallum comes up to its southern wall. Traces of the main streets, which led from the different gates and crossed each other at right angles, can still be distinctly traced. Remains of suburbs and villas outside the camp have also been discovered, and suggest the theory that the chief officer in command had his quarters outside the fortifications in times of peace. The three largest and best-preserved stations are Chesters, the ancient Cilurnum ; Birdoswald, the ancient Amboglanna ; and Housesteads, the ancient Borcovicus. These camps are all within easy distance of Gilsland. The identification of these stations, in whose modern homely names no trace of their ancient high-sounding Latinity survives, has been possible by the Notitia, a record of the Roman days equivalent to our modern Army List. In the Notitia each camp along the line of wall is named, with its corresponding number of soldiers and the legions to which they belonged. Thus, when we find that at Cilurnum the garrison belonged to the Asturian tribe, and when at Chesters alone among the camps we find inscriptions to Asturian soldiers, the inference is obvious. So with the other camps, which were occupied by Batavians, Dacians and others.

A brief description of Chesters will serve as a type of the other camps (twenty-three in number), most of which are now level with the ground and serve as pasture-land for sheep. At Chesters, thanks to the careful excavations of Mr. Clayton, owner of the property, the ancient masonry is considerably above the level for the ground, and the plan of the Roman camp, with its gateways and guard-chambers, its prætorium, its forum, with narrow streets, and its broader streets intersecting it in the middle and leading to the gateways, lies like an open scroll before us. The remains of the gate are quite high, and are in excellent preservation. Each gateway has two portals, about eleven feet wide, separated by a wall, on either side of which is a guard-chamber. The portal was closed by a massive two-traved gate, the hole in the masonry on which the pivot turned being still distinctly traceable. Other buildings, of which the foundations are well preserved, were presumably used as granaries and store-chambers. The forum has been identified from its structural similarity with the forum at Pompeii. Below the soil many fragments of pottery and Samian glass, coins and ornaments have been found ; also bones of animals and shells of mussels, oysters and limpets, a species of food to which the Romans were much addicted. There is much else of interest at Chesters outside the limits of the camp, notably the foundations of a great Roman bridge, and a large and lofty group of buildings, recently excavated, including, amongst others, the well-preserved remains of Roman baths. So much for the camps. The mile-castles were, as their name denotes, placed along the wall, at the distance of a mile from each other between the camps. They are massive, quadrangular buildings let into the wall, 60 feet by 50, with gateways to the north and south. Some of them are in a very good state of preservation, more especially one in the neighbourhood of Housesteads. Between the mile-castles were three small turrets or sentry-boxes, of which the remains are less easily traced. The wall itself is in no place entirely perfect, but from the evidence of the best authorities it must, when it was constructed, have been eighteen feet high by eight feet broad. Now it rarely reaches an elevation of over five feet, and in breadth it averages from three to five feet. At some places it disappears entirely, at others it appears in a very fragmentary state.

TESSERÆ.

The Vitruvian Architect.

ARCHITECTURE has been defined as the art of building ; but this art can only rank among those called the liberal arts, when it is practised according to principles taken from nature, and when it follows the rules which relate to those wants and gratifications of our eyes and of our minds which require to be satisfied by the architect. The etymology of this word sufficiently shows that, in Greece, the artist to whom it was given was, in fact, the supreme director of the labours and works which are combined in the formation of an edifice. Therefore, the superior nature of this office leads us to suppose that he who filled it possessed a rare combination of talents and general knowledge. The number of qualifications which Vitruvius exacts from an architect conveys to us the highest idea of the powers which the ancients recognised, both in the art and in its professors. "In this art," says the Roman architect, whose theory we shall greatly abridge, "as in everything else, we distinguish what is signified from what signifies. The thing signified is that of which we treat, and that which signifies is the description of it, set forth by reason, and supported by science. Thus, in architecture we separate practice from theory. The first is executed by the hands, which give to the material, whatever it may be, its proper form. The second demonstrates ; it explains works executed by the aid of judgment and by the rules of proportion. Thence it results that architects without theory, assisted by practice only, and limiting themselves to the executive department, have never been able to acquire any name by their works. The same thing has likewise happened to those who, confining themselves to theoretic knowledge, have failed in their object by pursuing its shadow. The reason why it is necessary that the architect should be equally acquainted with practice and theory is that his imaginative and executive powers should alike be cultivated; for genius without perseverance, or perseverance without genius, can never form a perfect artist. The architect ought, therefore, to be able to write and draw, to have studied geometry, and not to be ignorant of arithmetic ; he should know history, be skilled in philosophy, and have some acquaintance with music, besides a smattering of medicine, jurisprudence and astronomy." Pythius, one of the most celebrated architects of antiquity, who distinguished himself by the construction of the temple of Minerva at Priene, exacted from architects (as he expresses himself in a treatise he composed) a still more profound knowledge of each particular science than would be exercised by the professors of the sciences themselves. Vitruvius is more judicious, for he only requires a moderate knowledge of the different branches of science. He says, "It is neither possible nor necessary that the architect should be as good a grammarian as Aristarchus, as great a musician as Aristoxenes, as excellent a painter as Apelles, as skilful a sculptor as Myron or Polycletus, or as learned a physician as Hippocrates. It is enough," adds he, "that he should not be ignorant of grammar, music, sculpture and medicine ; the mind of any one man not being capable of attaining perfection in such varied and eminent acquirements." To these particular or general studies, Vitruvius desires the architect to unite much perseverance and disinterestedness. "I know well," he continues, "that a great part of the world hold the opinion that the chief end of wisdom is to render us capable of amassing great riches, and that there have been few men found who have been fortunate enough to acquire wealth and reputation together, since, for the most part, their principal care is to seek for great employments. As for me, I have learned from my masters that an architect ought to wait until he is solicited to undertake the conduct of a work, and that he cannot without shame make a request that would cause him to be regarded as an interested man. We know that we do not importune people to do them good, but to receive good from them. What would a person think who was asked to permit his goods to be laid out to a great extent, except that he who required such a favour of him hoped to make some great profit to his detriment? This is the reason why people formerly, before employing an architect, made inquiries respecting his birth and education, and they trusted more to those who appeared diffident than to those who affected great capability. The custom likewise of those times was for architects to instruct only their own children or relations, or at least only those whom they judged capable of acquiring learning to the extent required from an architect, and for whose fidelity they could answer." After this enumeration of the attainments which were considered necessary for the practice of architecture among the ancients, we ought not to wonder that Plato asserted "that a good architect was a rarity in Greece."

Velasquez as a Court Official.

Upon the return of Velasquez from an artistic mission in Italy in 1651, the King, as an especial mark of favour, conferred upon him the office of aposentador mayor, or quartermaster-general of the royal household, an office of great dignity and much emolument. The fatigues of courtly etiquette and the solemn duties of aposentador mayor weighed in course of years heavier by far upon the body and soul of Velasquez than either age or the labours of his artistic career. We can hear with a certain patience of this richly-endowed artist devoting the best years of his life to the painting of royal countenances and the splendours of a solemnly magnificent court, which was at once bigoted and licentious, because through these works of Velasquez's pencil we receive the most valuable historical commentary. But when we read of the duties of this high aposentador mayor being, amidst countless others, of a scarcely more important, but not less tedious, character, than the providing of lodgings for the King and his train in all progresses ; the placing of His Majesty's chair and removal of the cloth when the King dined in public ; the issuing of keys to new chamberlains, and the setting of chairs for cardinals and viceroys who came "to kiss hands," it is difficult to say which feeling becomes most dominant in one's mind, disgust at the stupid blindness of a King who, professing to appreciate art and Spain's greatest painter, devoured this painter's life with ceaseless calls upon him for personal attendance on daily occasions of senseless, solemn etiquette ; or regret that Velasquez should so weakly and complacently have yielded to this slavery of pomp. A

solemn and festive meeting of the two courts of France and Spain, to celebrate peace and the nuptials of Louis XIV. and the Infanta Maria Teresa, having been arranged to take place in the summer of 1660 in the Isle of Pheasants, in the river of Bidasoa, Velasquez was despatched in March of that year to superintend the erection of a magnificent pavilion upon this islet, which, as neutral ground, has witnessed so many strange events connected with the annals of France and Spain. But not alone had the renowned aposentador to superintend the building of this pavilion; but he had to prepare the Castle of Fuenterrabia for the reception of his royal master and to provide lodging for the royal train all the way from Madrid to the Bidasoa; and this gorgeous train travelled with oriental numbers and magnificence. When we read that "the baggage of the royal bride would alone have served for a small army;" that "beside personal equipments she carried a vast provision of presents, amongst which were two chests filled with purses, amber gloves and whisker cases for her future brother-in-law, the Duke of Orleans;" that "the grandees of the household vied with each other in the size and splendour of their retinues;" that "the cavalcade extended six leagues in length, so that the trumpets of the van were sounding at the gate of the Alcalà de Henares, the first day's halting-place, ere the last files had issued from the gates of Madrid;" and that "the whole journey through Burgos and Vittoria was a triumph and a revel," one can form some faint idea of what hurry, excitement and fatique must have overwhelmed the old painter, accustomed even as he had been throughout his life to court etiquette and pompous festivities. Add to which, Velasquez had to await the King's arrival at San Sebastian for two months, superintending his preparations for the reception of the royalties; to be in attendance upon Philip when he did arrive at San Sebastian; and during the three weeks of his stay there, pending the final negotiations, and "when His Majesty's table was sometimes nearly overturned by the throngs of French who came to see him dine;" that he attended Philip to Fuenterrabia and was actively employed by his office throughout the week of pomp which the two courts passed on the frontiers of the two kingdoms. These grand and glorious festivities terminated his career. Though apparently in his usual health during the excitement of his fatiguing avocations, "a report of his death," says Stirling, "preceded him to Madrid, and he found them bewailing his untimely end; but the tongue of rumour had spoken in the spirit of prophecy: his worldly work was done, and fate forbade the pageants of the Pheasants' Isle to be recorded by his inimitable pencil." On July 31 Velasquez was seized, on retiring to his apartments after attendance upon His Majesty, with feverish symptoms, which greatly alarmed his physicians. After receiving every possible attention he expired in the afternoon of August 6, 1660. After lying in state, the body was conveyed with almost royal pomp at night to the parish church of San Juan. Eight days later expired the wife of Velasquez, Juana Pacheco, the daughter of Velasquez's old master and his first biographer. The husband and wife repose in one grave.

Moseley's Theory of the Arch.

In every structure composed of series of uncemented stones in contact, Professor Moseley supposes the existence of two lines called the line of resistance and the line of pressure. The former line is determined in the following manner:—Each two adjacent stones will exert mutual pressures distributed over their surfaces in contact, and these pressures have a single resultant, that is, might be conceived to be collected at a single point in the surfaces, where they would have the same statical effect as they actually have when distributed over the surfaces. Let these points in question be determined for every two surfaces; then the imaginary line passing through them is the line of resistance. In other words, the line of resistance is the *locus* of, or line passing through, the points of application of the resultants of the mutual pressures of the stones. The line of pressure is determined in the following manner:—From each of the points of application above-mentioned draw a line representing the direction of the resultant. The curve touching all these lines is the line of pressure. In other words, the line of pressure is the curve to which the direction of every resultant of the mutual pressures is a tangent. The line of resistance determines the liability of the stones to turn on their edges; the line of pressure their liability to overcome the friction along their surfaces by sliding past each other. It is then shown that the least horizontal force at the keystone which will suffice to sustain one semi-arch is that exerted by the opposite equal semi-arch. For the pressure so exerted is the measure of the tendency of the latter semi-arch to fall forwards, and is therefore evidently the least force which would sustain it. The same force is therefore also the least which would sustain the former semi-arch, if both semi-arches be exactly similar. Too great a horizontal pressure applied at the crown would cause some joint of the semi-arch to open on its under side, the portion of the arch between that joint and the crown turning about the superior edges of the joint. On the other hand, too small a horizontal pressure at the crown would allow a part of the arch between the crown and a joint of rupture to turn about the inferior edges of that joint. Professor Moseley shows from this consideration that when the greatest and least horizontal pressure consistent with equilibrium is applied, the "line of resistance" touches some point of the extrados or intrados respectively; and that point is the upper or lower edge of a joint of rupture. The position of the point of rupture depends not only on the value of the horizontal thrust, but on the point in the crown where that force is applied. With respect to an uncemented arch, Professor Moseley considers all uncertainty on this head removed by the consideration that, "on the striking of the centres, the arch invariably sinks at the crown, its voussoirs there slightly opening at their lower edges, and pressing on one another exclusively by their upper edges." The author does not probably intend here to assume that the application of the pressure at the summit will be confined to single mathematical lines. Whatever be the material of the voussoirs, it will be, in some degree at least, compressible; and the pressure will therefore be distributed over a finite area of the surface of the joint. The smaller the breadth of that area, the greater the pressure per square inch; and before the breadth could be reduced to a mere line, the pressure per square inch would become so great as to crush the material. It is obvious also that the voussoirs might have such forms given to their surfaces of contact that their upper edges might not press upon, nor even closely approach, each other upon the settling of the arch. In fact, that portions of the voussoirs shall ultimately press on each other may be varied arbitrarily, provided that the surfaces of contact be so formed that the areas of contact be sufficiently large to resist the tendency to crush the material. The course of the investigation then leads to the determination of the point of rupture in the intrados of a semicircular arch; the point of application of the pressure at the summit being assumed. In this investigation the voussoirs are supposed to be of equal depth, homogeneous, and to bear no load but their own weight. Then follow similar investigations for the case where the semi-arch is loaded by a mass of which the upper surface is an inclined plane—the arch and superincumbent mass being homogeneous—and for some other cases. In all these instances the point of application of the pressure at the crown is assumed. As that point is, however, variable, the stability of the structure is not completely ascertained until it be shown that the arch will have no angle of rupture, however the position of that point be varied. The variation of that point affects the value of the horizontal pressure at the crown, and as has been said, if that pressure be reduced too much, there will be a joint of rupture in the intrados. Consequently it is necessary to show that the minimum value of this pressure dependent on the variation does not correspond to a joint of rupture in the structure. And Professor Moseley therefore proceeds to establish the necessary mathematical conditions. The case just referred to is that of the sinking of the crown of the arch. Of course in the corresponding case of the rising of the crown the maximum value of the horizontal pressure applied there has to be determined.

Indian Rock-cut Temples.

Almost every one who sees these temples is struck with the apparently prodigious amount of labour bestowed on their excavation, and there is no doubt that their monolithic character is the principal source of the awe and wonder with which they have been regarded, and that, had the Kylas been an edifice of masonry situated on the plain it would scarcely have attracted the attention of European travellers at all. In reality, however, it is considerably easier and less expensive to excavate a temple than to build one. Take, for instance, the Kylas, the most wonderful of all this class. To excavate the area on which it stands would require the removal of about 100,000 cubic yards of rock, but, as the base of the temple is solid and the superstructure massive, it occupies in round numbers about one-half of the excavated area, so that the question is simply this, whether it is easier to chip away 50,000 yards of rock and shoot it to spoil (to borrow a railway term) down a hill-side, or to quarry 50,000 cubic yards of stone, remove it, probably, a mile at least to the place where the temple is to be built, and then to raise and set it. The excavating process would probably cost about one-tenth of the other. The sculpture and ornament would be the same in both instances, more especially in India where buildings are always set up in block and the carving executed *in situ*. Nevertheless, the impression produced on all spectators by these monolithic masses, their unalterable character and appearance of eternal durability, point to the process as one meriting more attention than it has hitherto received in modern times, and if any rock were found as uniform and as easily worked as the Indian amygdaloidal traps, we might hand down to posterity some more durable monument than many we are now erecting at far greater cost.

NOTES AND COMMENTS.

ON Monday in last week the committee decided as to the plans to be adopted for the new Sunday Schools, Zion Chapel, Kendal. Six sets of designs were sent in under motto, each possessing undoubted merit. A building committee, consisting of men considered to be the most practical in the congregation, was appointed to examine the plans minutely, and after three prolonged sittings, occupying many hours, they ultimately decided, by four to two, that the design sent in under motto "Light and air" should be placed first in order of merit, and that it should be recommended for adoption; the design under motto "Be his the palm who merits it" receiving two votes. This was subject, however, to a further decision of another committee, consisting of twenty-four members, who after a short deliberation reversed, by ten votes to seven, the decision of the committee whom they had appointed to adjudicate upon the plans, upsetting in a fractional part of the time the laborious work of the first committee. The general plan was pretty similar in both designs, the ground-floor being left for a schoolroom without obstruction, and the first floor being divided into classrooms on three sides, with open space in centre. One of the conditions was that the schoolroom should be lofty and well lighted. The premiated design shows the schoolroom 8 feet 6 inches high; the design placed second shows the schoolroom 12 feet high. The schoolroom averages about 54 feet by 47 feet inside. The decision of this competition shows the desirability of having a professional adviser brought in in such matters, or at any rate it should be made known to intending competitors how many committees are likely to be called on to adjudicate, and how the experience of the committee for the work of adjudication is to be gauged. The design bearing the motto "Be his the palm who merits it," is by Mr. STEPHEN SHAW, F.R.I.B.A., who will carry out the building. The design awarded second prize, and bearing the motto "Light and air," is by Mr. JOHN STALKER, M.S.A., who received ten guineas. Both architects are practising in Kendal.

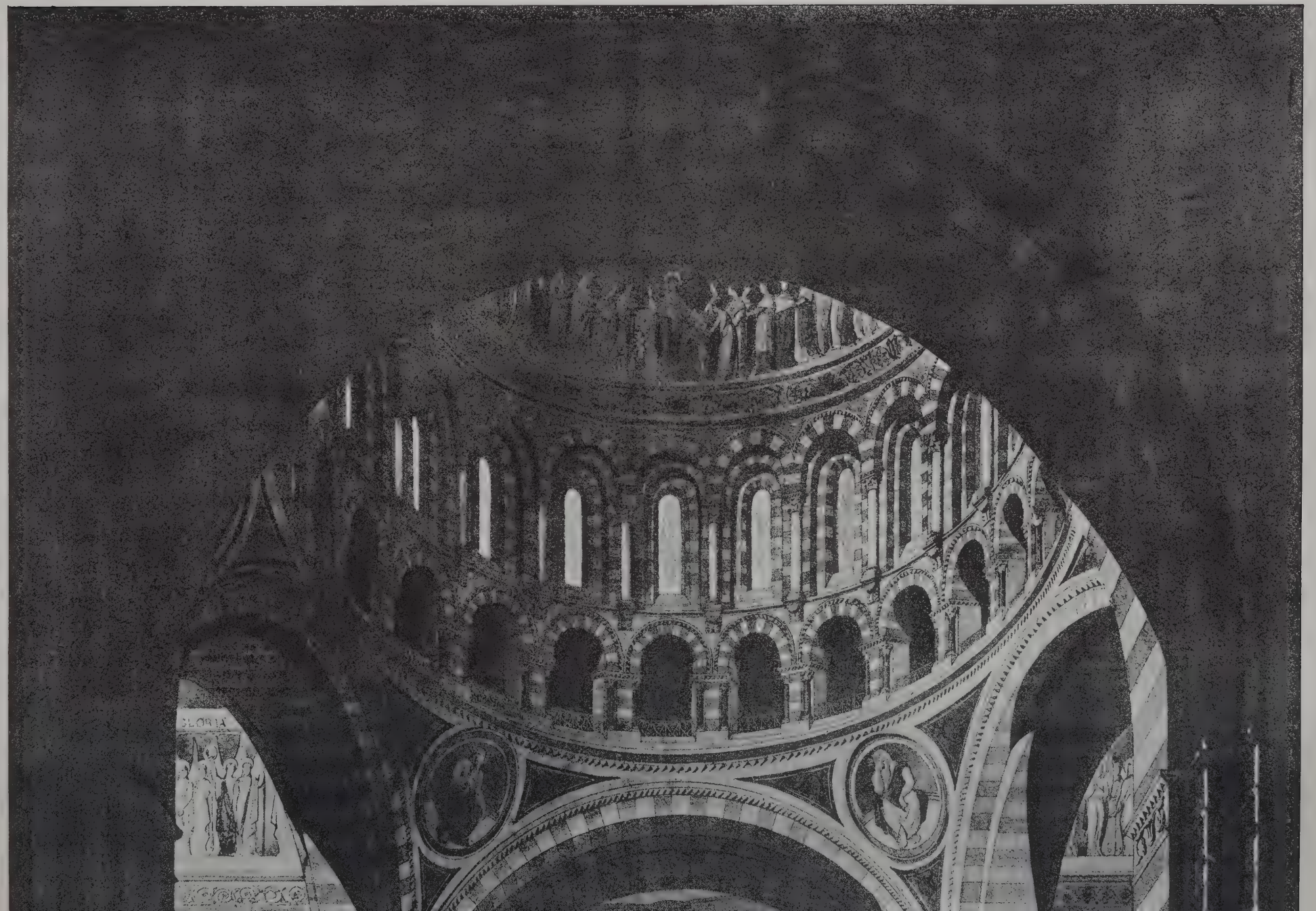
IN regard to the building trade dispute at Norwich, the Mayor, in a letter addressed to the carpenters and joiners and bricklayers, states that, the masters having made their final offer, he recommends the men's acceptance of the amended code of rules proposed by the employers. The men's endeavour, he says, to better their position will not have proved fruitless, as they would gain some material advantages, and, moreover, there are some hundreds of labourers in the city, willing and anxious to work, who are prevented earning their livelihood by the action of the strikers. In the case of refusing these terms, the Mayor views with apprehension the fact that the summer is fast slipping away, and the probability of another severe winter. He also warns the men that in the event of their declining to act on his suggestion the public sympathy, which has been freely accorded them, may be withdrawn, and he appeals to the men in the interest of the city to make some sacrifice and return to work at the earliest possible date. The result, however, has been that the carpenters have pledged themselves to continue the struggle until the employers give way on the question of lodgings, &c., on country jobs, and the bricklayers have decided to adhere to the Mayor's original set of conditions.

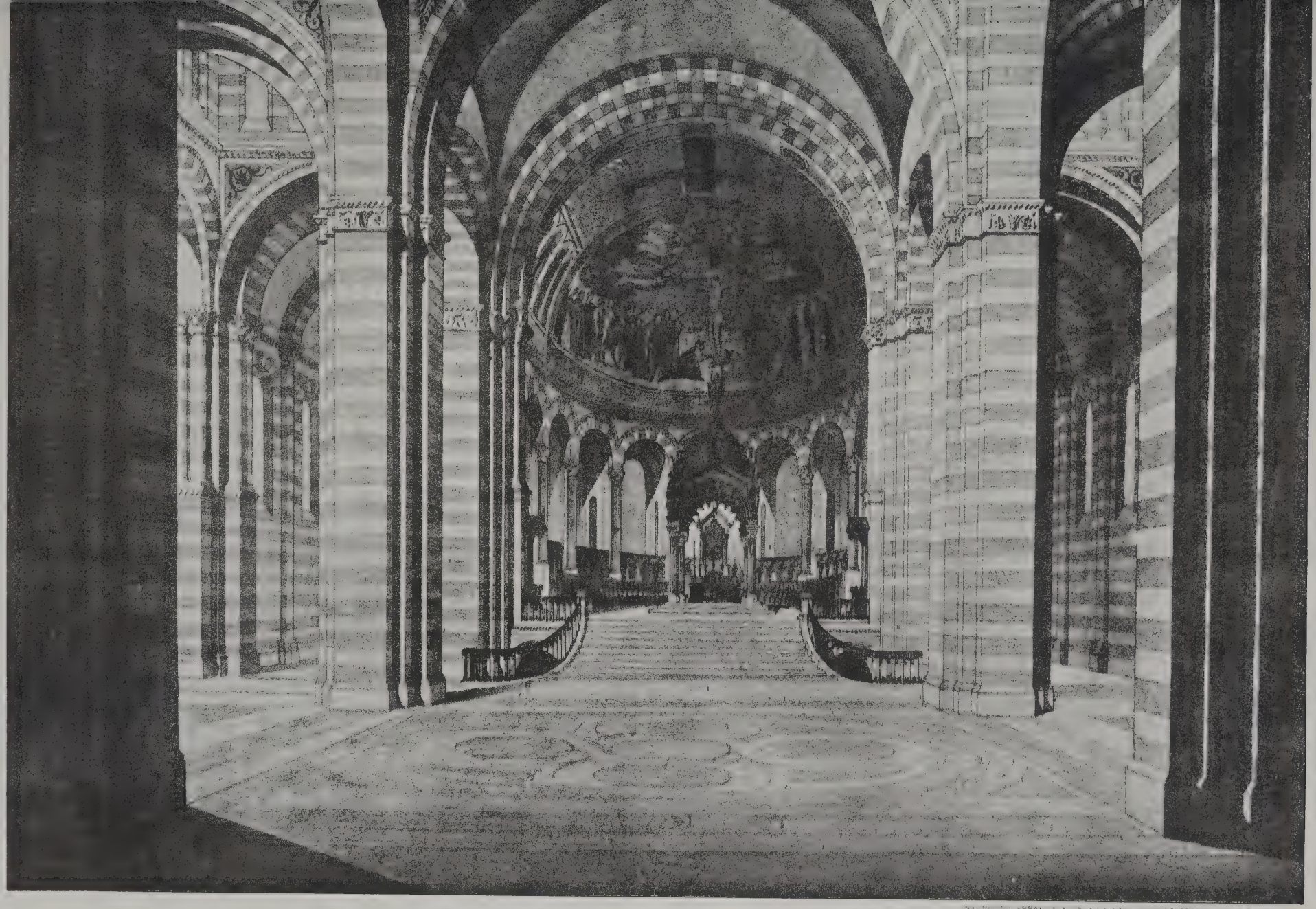
A CASE has been brought in the Wandsworth Police-court, in which the Southwark and Vauxhall Water Company had summoned Mr. CURNICK, an owner of house property, for neglecting to comply with the regulations under the Metropolis Water Act of 1852 and 1871. The question was whether the owner was compelled to make the alterations said to be necessary for a constant supply of water to his premises, consisting of a block of houses in the parish of Wandsworth. It was stated that a serious question was involved, as notices had been served on the owners of property in Wandsworth to carry out alterations which would necessitate an expenditure of 15,000*l*. The Water Company relied on the regulations of 1871, which made it the duty of owners of houses to provide each house with a separate communication from the company's main. It was argued on the side of owners, however, that they were subject to the regulations of 1852, which provided that there may be one communication-pipe for a group of houses where the water-rate was paid by one man, as in Mr. CURNICK's case. The company had a right in 1852 to put on a constant supply of water to the house. They had taken no action for twenty years, and now called upon owners to go to the expense of 5*s*. in some cases and 50*l*. in others. There was nothing in the Act to compel owners to provide the fittings demanded of them by the company. The solicitor to the company stated that the fittings must be made according to the regulations, and that the company were desirous now of making the supply constant instead of intermittent. If the company cut off the supply, the consumer would have to comply with the regulations before getting a supply. To this Mr. CURNICK's representative replied that they would bring an action against the company and recover heavy damages. The summons was dismissed without costs.

THE annual adjudication of prizes to the students of the Royal Hibernian Academy of Arts, Dublin, has just taken place. The judges, Sir THOMAS A. JONES, Mr. P. VINCENT DUFFY, R.H.A., and Mr. F. B. BARWELL, have made the following awards:—A silver medal, in special competition from the living model, to R. S. SHORE; a prize of 4*l*., for the best study from the living model, to C. E. LODGE; a prize of 2*l*., for the second best, to J. O'REILLY; and a prize of 1*l*., for the third best, to HENRY TISDALL; a prize of 4*l*., for the best study in the painting class, to C. E. LODGE; and a prize of 3*l*., for the second best study in the painting class, to J. O'REILLY.

A CURIOUS question is raised by a case at present under consideration in the Dunfermline Sheriff's Court. The Dunfermline District Committee of the Fife County Council, as the local authority for the parish of Aberdour, have asked the Sheriff of Fife to grant an interdict prohibiting the local authority of the burgh of Inverkeithing from selling water for trade purposes, which would interfere with a full domestic supply for the water-supply district of Aberdour. It is alleged that enormous quantities of water are sold to the North British Railway Company for the Forth Bridge; and as the result of this and a continual drain for other trade purposes, the domestic supply for Aberdour is being seriously interfered with, houses situated on a high level having been frequently during the past three months without a drop of water for days. On the contrary, the Local Authority deny the allegations of the complainants, and maintain that they cannot be held in any way responsible for any deficiency which may have been experienced in the Aberdour supply. They allege that complainants are allowing the people of Aberdour to sell water for trade purposes, and argue that this trade-supplying should be stopped before any move was made against Inverkeithing Local Authority and its trade supply. The matter was adjourned till Monday next.

We have from time to time noticed some of the works by M. EMILE MICHEL which have been issued by the Librairie de l'Art, Paris. Originally a landscapist, M. MICHEL has of late years devoted himself to an investigation of the history of the Dutch schools, and he has spared no toil in the study of documents and in the most elaborate investigation of the paintings. The biography of REMBRANDT in the series "Artistes Célèbres" was an indication of the method followed by the author, and it is no wonder the book has met with considerable success. So much thoroughness could not be overlooked, especially in a city like Paris, where knowledge of a subject is so often supposed to be an obstacle to that delicacy of treatment which Frenchmen so often desire. M. EMILE MICHEL has been commissioned by MM. HACHETTE to prepare a large work on REMBRANDT, in which will be comprised a detailed and illustrated history of all the works of the master. About the author's competence for the task there can be no misgiving, and we have no doubt the new book will be among the most important of those which have gained renown for the house of HACHETTE. The publishers have done and are still doing much for art, and it is to be regretted that in this country they have no imitators.

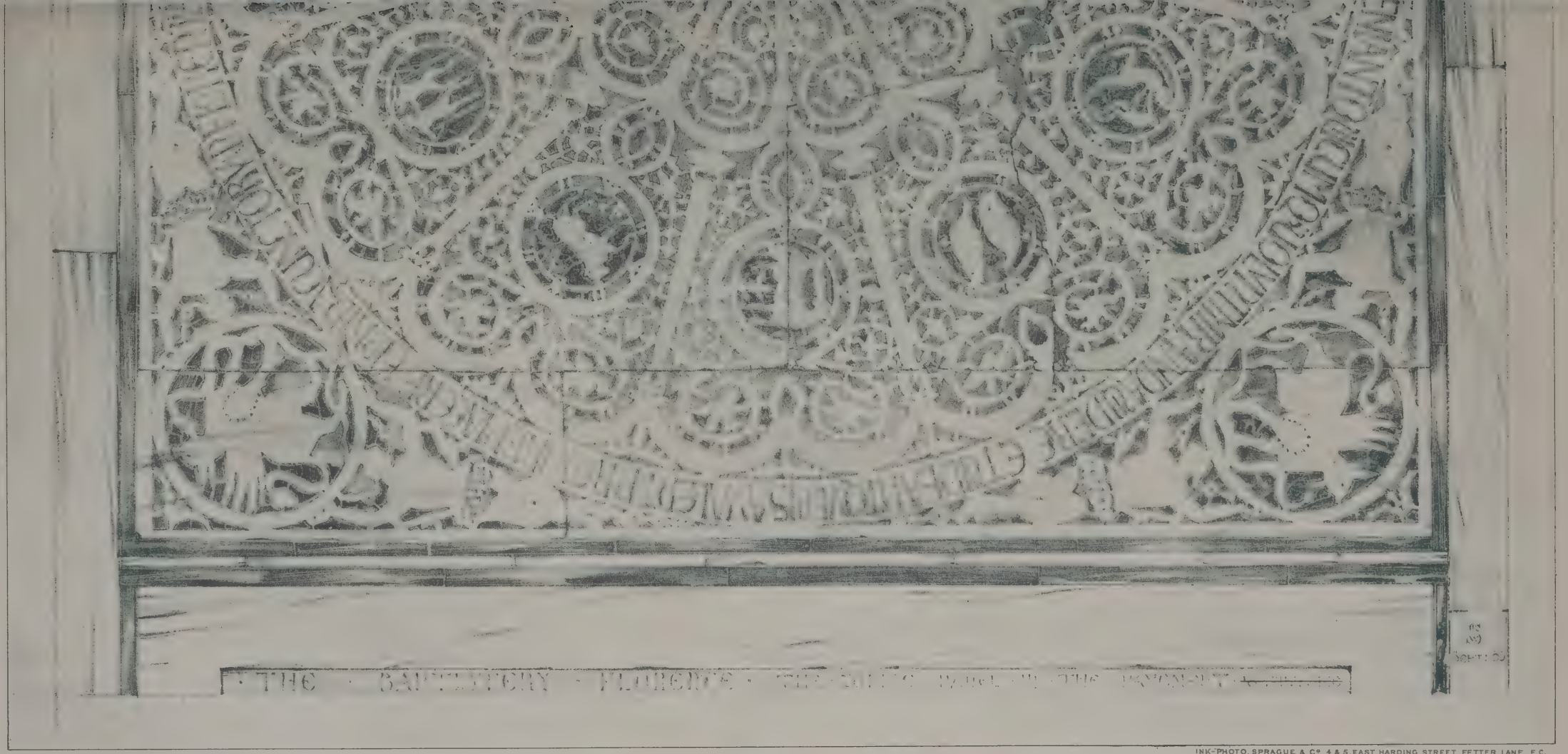

GLORIA



THE CHURCH OF THE SACRED HEART, MONTMARTRE, PARIS.

The late M. ABBADIE, Architect.





INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

Scale of Ins 12 9 6 3 0 1 2 3 4 5 6 Feet

FROM A DRAWING BY R. W. SCHÜLTZ.



THE CHURCH OF THE SAC

The late M

July 3rd 1891.



INK PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E C

D HEART, MONTMARTRE, PARIS.

BBADIE, Architect.

ILLUSTRATIONS.

CHURCH OF THE SACRED HEART, MONTMARTRE.

WHEN the project for a new church at Montmartre was first mooted, it was intended to obtain the design through the medium of an international competition. The building was to be Catholic in the full meaning of the word, and it was only right to seek universal aid towards its creation. Accordingly some English designs were sent in, notably one by Messrs. Phené Spiers and Phipps. But in a short time the project assumed a new character. It was held that the new church was to be essentially national, and to be expressive of the hope that the boundaries of France should correspond with those which existed prior to the last war. Accordingly, the style that was alone considered to be essentially French was recommended for the new building. In spite of the splendid work with which Mediæval architects enriched France, Gothic has been taken to be no more than a synonym of German, and the style no longer commands respect. A Gothic church at Montmartre was, therefore, out of the question. Renaissance was considered to be too Pagan and frivolous to be expressive of the aspirations of men and women who united patriotism with piety in their thoughts. Accordingly, the severe Romanesque which was used prior to the invasion of the Goths was adopted.

The fitness of the style was at once recognised. Since the ages of faith there has been no such enthusiasm in contributing immense sums of money as France has witnessed during the past fifteen years. Societies as well as individuals have shown eagerness to be associated with the immense work, and there are no signs that the supplies are exhausted. The crowds that every day come from all parts of France to worship in the new building are evidence of the strength of the principle that is realised by the masonry, and of the readiness to make sacrifices to uphold it.

In spite of the large sums expended, the church at present consists only of the parts which are required for services. All the towers which are necessary to give predominance to the church in a general view of Paris have yet to be undertaken. There is no adornment of any kind, and the altars used are temporary structures. Some years will have to elapse before the architect's design, as shown in the illustrations, will be completed; but the people who use and who have erected the church can wait, and probably would not object if the finished structure became a memorial of the victories of France.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 379.—THE ZODIAC PANEL IN THE PAVEMENT, THE BAPTISTERY, FLORENCE. [R. W. SCHULTZ.]

NEWBURY FIELD CLUB.

AN excursion was lately made to Guildford and Loseley by the Newbury District Field Club, the arrangements for which were made by Mr. Walter Money, F.S.A., of Newbury. A report of the excursion appears in the *Reading Mercury*, from which we make a few extracts as follows.

At Guildford the party were received by the Mayor and afterwards visited Trinity Hospital, or as it is more familiarly known, Archbishop Abbot's Hospital, where the hon. secretary read some notes which had been prepared by Mr. Kershaw, F.S.A., librarian of Lambeth Palace, who joined the party in the afternoon. Mr. Kershaw observed that of the three famous brothers, who all rose to distinction, George Abbot, Archbishop of Canterbury, naturally attracts our attention, from having founded the fine and interesting hospital in this town. From a copy of the statutes of that institution, which has long been preserved at Lambeth, I am led to note a few of the more prominent items in those statutes, as well as to give a very short sketch of the archbishop's career. Like his predecessor, Dr. Whitgift, who founded a similar hospital at Croydon, we find the most careful attention to all matters of detail as to the constitution and government of both institutions. In the muniment room at Abbot's Hospital, Guildford, I am told the original copy of the statutes exists as well as the royal charter of King James, both of which documents are fully given in Russell's Life of the archbishop, published in 1777. The copy at Lambeth, however, is presumably almost a counterpart of that of Guildford, and was lent to the Exhibition of Art in that town in 1884. The Lambeth copy of the statutes is on vellum, in a bound book of twenty-nine pages, having at the end the autograph signature of Dr. Abbot, dated August 17, 1629, and on both outside covers the arms of the archbishop, viz. "a chevron between three pears, *or*," attached to the usual bearings of the archiepiscopal see. The pears which appear on the coat-of-arms have given rise to various theories, and one likely supposition is that on the arms of Warden Abbey, Bedfordshire, pears were introduced. Warden pears were much prized by the monks on account of keeping a long time. Pears are sculptured at Jervaulx Abbey in York, and also appear on the arms of Hartland Abbey, Devonshire, and although one cannot arrive at a final decision as to the reason of the pears being introduced in the archbishop's sheld, the close alliance of the name Abbot, also spelt Abbat, with the monastic fraternity, may account for their fondness for pears, and their appearance in the quarterings of one who bore a monkish name. Of the Founders' statutes in MS. 727 Lambeth Library, we remark they are divided into twenty-nine chapters, relating severally to the duties of the master, vice-master, the inmates, residence, repairs to the building, rents and allowances to the hospital and other particulars.

The hospital, which is a somewhat imposing looking structure, is built of brick, in a quadrangular form, with a noble tower at its entrance, with four turrets over the main entrance gate. It was founded and endowed by George Abbot, Archbishop of Canterbury, who, on April 6, 1619, in the reign of James I., laid the first stone. The archbishop was the fourth son of Maurice and Alice Abbot, to whose memory there is a brass on the south wall of Holy Trinity Church. Maurice was married in 1548 at St. Mary's Church, and took up his abode near the bridge, where he carried on the trade of a clothworker or weaver. They had six sons, Richard, Anthony, Robert, George, Maurice and John. Richard was the first master of the hospital, to which office he was appointed by his brother the founder, in 1622. Anthony served the office of mayor in 1598; Robert was in 1615 consecrated Bishop of Salisbury by his brother, George, the archbishop; Maurice became a merchant of the city of London, and was the first person knighted by King Charles I. He was elected a member of Parliament for the City in 1625, and became Lord Mayor in 1638. In 1639, during a period of great distress, he gave 100*l.* to buy corn for the poor of Guildford. John, the sixth son, died at Guildford in 1654, and left certain benefactions to the poor. The hospital or almshouse was intended for twelve poor brothers and eight poor sisters, who were to be unmarried persons above sixty years of age, and who had lived in the town twenty years. At the present time the brethren and sisters receive 8*s.* weekly, with lodgings and fuel and vegetables from the garden. The buildings are of a massive and durable character. The ponderous doors at the entrance are beautifully carved with the archbishop's arms, and in the stonework of the archway is deeply cut the following appropriate motto:—"Deus nobis hæc otia fecit." There is a well-paved quadrangle of 68 feet by 63 feet, with pleasant greensward on the right and left. On the three sides of the quadrangle are the chambers for the brethren and sisters, the master's apartments, the chapel, the dining-hall and the kitchen. The tower contains a splendid apartment, approached by a very fine oaken staircase, the balustrades of which are quaintly and artistically carved, a description which also applies to the mantelpieces and other portions of the rooms. The walls are adorned with portraits of some of the early English reformers. The dining-hall is a splendid oaken chamber, with the old dog chimney fireplace. The chapel is remarkable for its quiet richness and beauty, and the windows are filled by fine specimens of painted glass, from designs by Dürer. The walls of the chapel are embellished with the portraits of Archbishop Abbot, Sir Nicholas Kempe, by Paul Vansomer; and Alderman Jackman, by J. Russell, R.A. The master's rooms are spacious and well furnished, and the quarters allotted to the brethren and sisters are of a comfortable character.

The Free Grammar School, on the opposite side of the High Street, was then visited. Mr. J. C. Honeybourne, M.A., explained that the oldest date that had been found carved in the building was that of 1597, which appeared in one of his private rooms. Some scholar had also carved his name and the date, 1614, on the stonework of one of the windows. The building had been admirably restored by Mr. Edward Lunnon, and Mr. James H. Money, architect, of Newbury, remarked that the trustees were to be congratulated upon the successful restoration. The main building consisted of a schoolroom on the ground-floor, 65 feet by 22 feet, with a refectory and class-rooms above. When the restoration was carried out, the removal of a plaster ceiling in the upper rooms disclosed a fine open-timbered roof, running the entire length of the building. The refectory and class-rooms were converted into one spacious schoolroom, and the fine old oak beams have been emblazoned with the names of some distinguished men who commenced their education here.

On leaving the school the party entered Holy Trinity Church, a large red brick edifice, occupying the site of a very ancient church, founded by the Testards for the benefit of their tenants. The last restoration of the sacred edifice was completed in 1869. Among the ancient monuments, the beautiful canopied altar-tomb to Archbishop Abbot is the most striking. It was erected by the Archbishop's brother, Sir Maurice Abbot, in 1640, and represents the prelate in a reclining position, attired in his episcopal and Parliamentary robes. His right hand rests upon a copy of the Bible, and the head is supported on a pillow. Above is a canopy supported by six black marble columns, bearing nine small figures in attitudes of devotion. The tomb bears a lengthened inscription in Latin. On the north side of the church stands an elaborate cenotaph, to the memory of Arthur Onslow, the famous Speaker of the House of Commons, who died in 1768, and who is represented on the monument as a senator of Rome. At the west entrance there is a tomb to the memory of Lord Mayor Parkhurst.

St. Mary's Church, which stands on the declivity of the hill, was described by the rector, who explained that it dated back almost to Saxon times, and was, he believed, the only church in England which had three apses. It contains some good Norman work, but the edifice was materially enlarged during the thirteenth century, as the character of the windows, side chapels, &c., is completely Early English. Extensive alterations were again made at a later period. Attention was called to the massive columns of chalk, and Captain Payne pointed out a small window known as the "lepers'" window, through which the lepers were supposed to have looked while divine service was being celebrated. The greatest interest, however, centred in the series of mural paintings on the vaulted and groined roof of the apse in the chapel of St. John the Baptist, on the north side of the chancel. Mr. J. G. Waller, F.S.A., who was the first authority to satisfactorily solve the subject of the paintings, states that they are unique in his experience, and especially curious in the manner in which they are associated together. In studying the whole group, with those of the arch in front of the vault, it is obvious one must view them as one subject, viz. "The second coming of our Lord in glory," for the centre of the composition on the upper part of the vaulting has the figure known as "The Majesty," a term of ancient use given to the figure of our Lord seated within an aureole, holding up the right hand in the act of benediction, in the other a book or orb. Two small figures of angels on each side of another face of the vault represent the heavenly host, thus cramped into a small space to make room for the series of subjects beneath, illustrating the religious culture of our ancestors. Commencing the reading from the right side of "The Majesty," the first that presents itself is a figure in a tub or vat, tormented by an ugly miscreant using a pitchfork. Reclining in front of the figure of Christ is a youthful figure in tunic and mantle symbolising St. John at Patmos, whither he was banished. By the side of this figure is a staff resembling that used by the arch-priest in some of the churches of Italy, or the *bourdon* of the pilgrim. The rest of the subjects on this side are undoubtedly from the legend of St. John the Evangelist. It has been suggested that these paintings were executed by William the Florentine, so called in a drawing of 44 Hen. III., 1259, cited by Horace Walpole in his "Anecdotes of Painting," and his presence at Guildford, about the above date, in amending the pictures of the great hall of the castle gives a probability to the suggestion. St. Mary's Church was thoroughly renovated in 1863, from the designs of Mr. T. Goodchild.

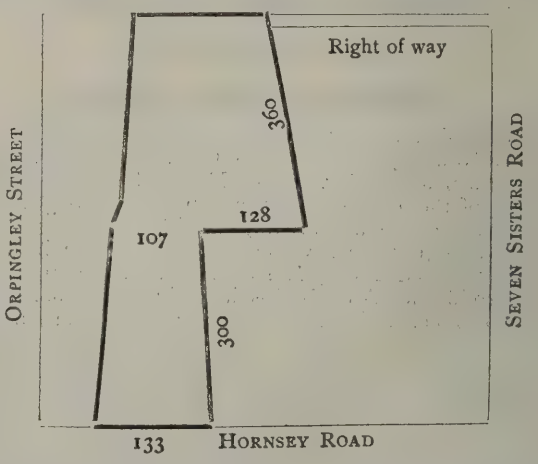
The fine old ruined keep of the castle, which forms a conspicuous object among the rest of the town buildings, was visited by a portion of the party, while the remainder lingered in St. Mary's Church to hear the description of the frescoes. The square keep is of Norman character, about 1150, and the present height of the walls, which are 10 feet thick, is about 70 feet. It was a stronghold of some importance, and is first mentioned in the annals of Waverley, under the year 1216, when it submitted to Louis of France, who after landing at Sandwich passed through Guildford towards Winchester, in pursuit of King John. In the time of Edward III. it was appropriated as the common county gaol. The castle grounds are now the property of the town, and the admirable way in which they are laid out is a great credit to the corporate authorities.

Loseley House is a grand Elizabethan structure, which stands in the middle of a charming park, some two miles south-west of Guildford. This district is remarkable for its beautiful scenery. Mr. W. More-Molyneux, the owner of the property, gave an interesting account of the house, which he described as being very much the same as when originally built by Sir William More between the years 1562 and 1568. Loseley is named in Domesday Book as belonging to the Earl of Arundel. After many changes of ownership, it devolved in the reign of Henry VIII. upon Mr. Christopher More, to whom the king granted a free warren and a license to make a park. The house is built of stone, and the main portion faces the north, overlooking a lovely tract of country. The visitors were received in the great hall, which is 42 feet by 25 feet. The walls are ornamented by armour and some good paintings, including portraits of Queen Anne Boleyn, by Holbein; Sir Thomas More, Sir William More and his lady; Sir George, Sir Robert, and Sir Poynings More; Nathaniel, who married Miss Booth, and his lady; Sir Thomas Molyneux, who married one of the two co-heiresses of the Mores; Elizabeth, her sister, who died unmarried; Sir More-Molyneux, his lady, and their eleven children in one large picture. There are also portraits of James I. and his Queen, Edward VI., Queen Elizabeth, &c. Loseley was several times honoured with the presence of royalty. Queen Elizabeth was a frequent visitor, and King James I. and Prince Charles paid visits to the mansion. On quitting the hall the visitors were conducted to the drawing-room, where there is an elaborate chimney-piece of native chalk, and on the cornice the mulberry-tree of the builder, with the motto, *Morus tarde moriens; Morium cite moriturum.* Mr. Molyneux explained that the carving of the chimney-piece was almost identical with a design of Holbein's in the British Museum. Ascending the noble staircase the visitors were conducted to the king's room, where James I. probably slept on his stay here. The ceiling is finely decorated with the Tudor rose, the lily of France, and the thistle of Scotland, and it is supposed that this was done in preparation for the king's visit. The adjoining room, which originally communicated with the king's bedchamber, is known as the queen's room, and the walls of both apartments are covered with rich and valuable tapestry.

THE HORNSEY ROAD BATHS AND WASH-HOUSES COMPETITION.

LAST week the designs submitted in the Hornsey Road baths and washhouses competition, for the parish of St. Mary's, Islington (Hornsey Road site), were exhibited in the Vestry Hall, Upper Street, Islington. Three premiums were offered of fifty, twenty, and ten guineas respectively, for the three best designs in order of merit. Mr. Charles Barry, F.S.A., acted as assessor and selected three designs, of which Mr. Hessell Tiltman, F.R.I.B.A., proved to be the author of Nos. 11 and 20, and Messrs. Spalding & Cross of No. 10. The former gentleman, who, be it noted, obtained first place in the Caledonian Road baths competition, will receive both first and second premiums, while Messrs. Spalding & Cross, who in like manner won two successive competitions for baths in Camberwell, receive the third premium. In all, twenty designs were received.

The accommodation suggested to be provided was as follows:—First-class swimming-bath, 132 feet by 40 feet (water area); second-class, 100 feet by 35 feet; ladies', 75 feet by 25 feet; and 100 slipper baths—20 first-class and 50 second-class for men, and 10 first-class and 20 second-class for women. A laundry for towels and a public washhouse to accommodate fifty washers, with drying closets, ironing-room, &c., engine and boiler-house, and all fittings and machinery—the total cost not to exceed 23,000*l.* The site comprises the grounds of Devon-



shire House and has a frontage of 133 feet towards Hornsey Road; the ground extends from this frontage 300 feet, narrowing to 107 feet, then widens out to the right 128 feet, with a further average depth of 360 feet.

The instructions were to provide for shops (not included in estimate) facing the Hornsey Road, allowing for suitable entrances to the baths and a separate entrance to the public laundry; and further, to keep the buildings as far as possible towards Hornsey Road.

Most of the competitors have placed the public laundry in rear of the bathing establishment, and several have provided

access to it and the boiler-house, &c., from Hornsey Road by means of a roadway. Others have used the whole of the front portion of the site, and have relied on the right of way from Seven Sisters' Road to give access to the laundry. Another point which must have exercised the wits of the conscientious competitor is the close proximity of the property in Orpingley Street to the boundary line, and the, therefore, apparent necessity of building in such a manner as not to interfere with the light and air of this property. With many competitors this consideration has not weighed heavily, including the gentlemen whose designs have been premiated. The point upon which a variety of ingenuity is displayed is the method of access to the buildings, allowing for the shops before mentioned, and it must be admitted that the method adopted in the first premiated design has many advantages. The front block of shops is centrally divided by a gabled archway leading into a quadrangle, on the left side of which is the public laundry, and facing the archway are the entrances to the bathing establishment. No. 12 has a similar entrance through a courtyard, an excellent elevation in Tudor style, and is, with the exception of the pay-boxes—of which there are three—carefully planned and of high merit. The design placed first has a modest but suitable elevation, and is well planned in most respects. The gangway surrounding the first-class bath is too narrow, and the arrangement of slipper-baths not the best from a bath-attendant's point of view. The public laundry, which is in front, is cramped, and the ironing-room is small in proportion; moreover, there is no possibility of extending this department should it be necessary. The large swimming-bath is longitudinally and centrally placed on the front portion of the site, and on the right side is a corridor of ample proportions giving access to the men's private baths and second-class swimming-bath. A similar corridor on the left gives access to the women's private and swimming baths.

In No. 20 the author has placed the large bath towards the right boundary, and shown direct front entrances, omitting courtyard, as in No. 11.

No. 10, the third premiated design, has a pay-box dividing men's and women's entrances in the front block; a long corridor divides the site, and on the right is placed the large swimming-bath, with the second-class in rear of it. The ladies' baths are on the left and the laundry in rear. Both planning and elevations are decidedly good. No. 17 is planned on similar lines to the above.

The following designs deserve mention for good planning and general merit:—No. 6, by Mr. Charles Bell, an economical and well-arranged plan and a neat Tudor elevation. No. 7, by Messrs. E. & T. Brown, is well planned. No. 12, by Mr. Henry S. Hare, has been previously referred to. No. 13, by Mr. Charles Rosher, has a compact, well-arranged plan, and the details show a close acquaintance with bath-work. The elevation to this design is in the same style as that of No. 6.

Owing to lack of space we regret the necessity of having to give such a brief review.

WESTMINSTER ABBEY.

THE final report of the Royal Commission appointed to inquire into the present want of space for monuments in Westminster Abbey has been presented to Parliament. The Commissioners, as a result of their inquiry, have made the following recommendations. They say:—We have to report that space may probably be found beneath the floor of the Abbey for interment for at least one hundred years to come if the duty of granting such burial be discharged sparingly, and with careful regard for the greatness of the national honour thereby conferred. But that no room now remains in the interior of the building for important monumental commemorations. We humbly submit to your Majesty that the memorials, illustrating the history of England for more than eight centuries, which the Abbey contains, are an inheritance of high national interest and value, and that the roll of such memorials ought to be continued. We are of opinion that no interference with existing monuments short of removal or rearrangement on a large scale would provide adequate facilities for this purpose. Such a course we are not prepared to recommend, and we do not think that even in individual cases memorials should be disturbed contrary to the wishes of the representatives of the dead. We find that provision adequate for such commemoration cannot be made in any existing building within the precincts of the Abbey, nor in any place not immediately connected with it. We have, therefore, taken evidence and considered plans for providing at the Abbey an additional place for memorials; and we have further to report that of the various schemes which have been brought before us there are two which we commend as specially suited for the purpose. The one proposes to clear an area now occupied by certain houses in Old Palace Yard, and to erect upon a portion of the ground so cleared a monumental chapel connected with the Abbey at Poets' Corner. We venture to recommend, whether the latter part of this proposal be adopted or not, that no time should be lost in removing the houses in Old Palace Yard above referred to, which not only conceal to a great extent the architecture of the chapel of Henry VII. and the ancient chapter-house, but are also a constant source of danger to the Abbey from fire. The other plan contemplates the erection of a monumental chapel on a vacant piece of ground, the site of the old refectory, lying immediately south of the great cloister and parallel to the nave of the Abbey. We believe that one or other of these last-mentioned schemes would provide a solution of the problem which has been submitted for our consideration. After a careful review of the arguments, we recommend that of the two schemes the latter should be adopted, and that, in order to carry it out, so much of the land required for that purpose as, under the Public Schools Act, 1868, became vested in the governing body of Westminster School, should be reconveyed by statutory enactment, if necessary, to the Dean and Chapter of Westminster Abbey. All which we humbly submit for your Majesty's gracious consideration.

D. Plunket. G. G. Bradley.
A. H. Layard. L. J. Jennings.
F. Leighton. A. Waterhouse.

June 24, 1891. Harold Dillon, Secretary.

We, the undersigned Commissioners, whilst cordially approving in other respects of the above report, feel ourselves obliged to dissent from its last paragraph, which recommends the adoption of the refectory site, and from such other passages as point to that conclusion, and we advise that preference should be given to the site at the south-east of the Abbey.

A. H. Layard.
F. Leighton.
G. G. Bradley.

The report of the Commissioners begins with the consideration of the historical side of the question, after which they state that:—

Before proceeding to discuss the various plans which have been brought before us for providing an additional place for commemoration of the dead at Westminster Abbey, it may be well to consider the possibility of finding the required room in some other way. It might at first sight appear an easy and natural escape from the difficulty which has been created by the absence of plan and want of discrimination shown in earlier times, simply to remove those monuments which it may be thought are least entitled to their present position, either because they offend against modern ideas of taste, or because those whose memories they recall may now be deemed to have been unworthy of such honours. But if the matter be more closely looked into, weighty reasons will be found against this solution of the problem.

For while it is true that something has already been done, especially under the judicious control of the late Sub-Dean Lord John Thynne, the late Dean Stanley and the present Dean, in the way of moving a little, and even reducing in size, some monuments in order to obtain more freedom and light for others, and while we think that something further may well be attempted in the same direction, it is obvious that in any such operations the greatest care must be taken not to offend public feeling and sentiment or to disturb historical associations which, in most cases, have given a special significance to the particular spot occupied by each effigy.

It may be said, generally, that memorials once set up within the Abbey with the assent of the Dean have rarely, if ever, been removed from the building, and have never even been shifted from one place to another within it contrary to the wishes of the representatives of the deceased, who, when known, have always been consulted; further, we were advised on high legal authority that it is extremely doubtful whether anything but an Act of Parliament could authorise the departure from this settled practice, and we are satisfied that if any proposal were now made by legislation or otherwise to interfere on a large scale with existing monuments, it would be met by vehement and well-founded opposition from many quarters.

Again, it has been argued that the cloisters might sufficiently provide sites for future monuments; but in answer to this suggestion it is enough to say that while it would, no doubt, be possible to put up a few mural tablets in addition to those already affixed to the walls, there is no room for any other kind of sepulchral record in those covered walks, which are used as approaches to Westminster School, as well as to the chapter-house, the Abbey and its surrounding residences. The cloister-walks are, even now, found to be too narrow upon festivals and other occasions when unusually large gatherings of people are brought together to attend the church. As to the alternative which remains, viz. that St. Paul's Cathedral should in future receive those memorials of the dead for which scope cannot be found in Westminster Abbey, we examined, amongst other witnesses, Canon Gregory (now Dean) of St. Paul's, and from him we learned that the authorities of the Cathedral would be strongly opposed to such a change, mainly

because little space is still to be found, either in the body of the church or in its crypt, available for the purpose. And even if this objection did not stand in the way, it must be remembered that while many of the greatest of our warriors and some famous artists have there been commemorated, the practice is of but recent origin, and the cases are few in which the distinction has been given to men who have in other ways made their lives illustrious. We doubt that it would be possible to graft upon this comparatively modern and limited practice the older and wider traditions of Westminster, or that St. Paul's would ever, for the purposes of such national honours, hold in the minds and imaginations of the people the place so long filled by the Abbey.

We now turn to the consideration of various suggestions which have been made for "providing at the Abbey an additional place for memorials." The first of these was originally communicated in the year 1852 by the late Lord John Thynne, then Sub-Dean, to Mr. (afterwards Sir Gilbert) Scott, as part of the instructions given for a report on the general condition of the Abbey at that date. The report in question, which is very full and detailed, was in 1854 laid before the Chancellor of the Exchequer (Mr. Gladstone), who appears to have adopted the principle that something should "be done for the Abbey by joint action between the State, the chapter and the public."

A reference to the text of this report (produced before us from the archives of your Majesty's Office of Works) shows that in the mind of Sir Gilbert Scott the principal reason in favour of providing such a building was the expediency of "freeing the Abbey" from a vast number of statues which he regarded as unworthy of their present situation within its walls by reason of their deficiencies in art, good taste, appropriateness or religious sentiment. At the same time, however, Sir Gilbert Scott pointed out that "the object in erecting such a national mausoleum in connection with the Abbey would not be merely to relieve the church of existing monuments, but also for the reception from time to time of new ones"; and he added, "unless the interior is to be entirely crowded up with them, and both the church and the monuments themselves rendered objects of public ridicule instead of veneration and interest, some such step seems to me to have become absolutely necessary."

Other schemes have since 1854 been brought forward with the same object as that explained in the passage of the report last quoted. These suggestions we will now group and consider in order of locality (but not strictly in order of date), as follows :—

1. The addition of a building on the north side of the nave.
2. The adaptation of the existing chapter-house.
3. The acquisition of a site and the erection thereon of a cloister or chapel to the east and south of Poets' Corner.
4. The utilisation of a vacant space adjoining and communicating with the south side of the great cloisters.

1. *Addition of Building on North Side of Nave.*

We have been led to give more than a passing consideration to this proposal, inasmuch as its advantages have been strongly urged by Mr. Pearson, the architect to the Abbey, who stated in his evidence that he had "a great love for" such a solution of the problem, and had thought out two plans for its accomplishment. In Mr. Pearson's opinion the scheme had the distinct advantage of affording a building which "would be an integral portion of the Abbey," and to which, for that reason, the sentiment so strongly attaching to the Abbey would extend, and he gave the following general description of his alternative plans :—

"One of these takes the form of an additional aisle to the nave, with chapels attached for the display of monuments, and with communications leading to it from the west end of the nave and from the north transept. I have not the least doubt that such an aisle, well-designed, in a style which would be distinct from the adjoining part of the Abbey, without being out of harmony with it, would form a great addition to the general effect of the structure, both externally and internally.

"It will be readily understood how well the recesses between the great buttresses and other recesses provided in the plan would lend themselves to the arrangement and display of monuments. . . .

"My second plan takes the form of a double cloister glazed on both sides, enclosing a garth with approaches from the Abbey, similar to the previous scheme. The four sides towards the garth I propose to divide into chapels, by transverse walls, and the recesses formed by the great buttresses of the nave would also be available as before."

Notwithstanding the weight which is justly due to the high authority of Mr. Pearson, we are unable to approve of the expedient he advocates, either on its own merits or as a scheme in competition with others suggested for the south and south-east sites. It is true that neither of these latter would provide a building in such immediate contact with the main body of the church as Mr. Pearson's north aisle would be, but we do not believe that the slightly greater distance at which they would stand could seriously hinder them from gradually sharing with the Abbey the place which it alone now holds in the feelings of the people. On the other hand, the objections are grave and practical; and even admitting that it is free from any difficulties connected with the acquisition of a site, advantage so gained would be outweighed by obvious drawbacks and by the unpopularity which would certainly beset its adoption. His Grace the Archbishop of Canterbury concisely formulates the main objections to such a scheme.

"It (the north side of the nave) is the only part of the Abbey in which you see the whole design of the church by itself; the south side is so entirely blocked up by other buildings, and the east end is so altered by Henry VII.'s Chapel, and blocked by St. Margaret's, the projection of the chapter-house is so great and the alteration of the west end is so great, that there is no other part of the Abbey which gives you an idea of what was the original design of it as a great church. Therefore the erection of any building against it, even if it were a low building, would completely block out the original conception of the Abbey, and would prevent a view of the elevation, and then, amongst all the cathedrals of England, it would be the one which could not be seen. The interior alteration would be also great."

2. *Adaptation of Existing Chapter-house.*

As a seemingly short and simple method of solving the problem, the possibility of making use of the fabric and site of the chapter-house has been urged from more than one quarter. The writer of the articles in the *Nineteenth Century*, which are printed in the appendix to our first report, while dealing with those parts of the Abbey buildings which, in his view, are immediately available for the reception of memorials, says that "the chapter-house and its fine vestibule would furnish further space," and that "nearly 100 monuments, including thirty great statues (colossal, if need be), could be ranged around its walls with magnificent effect."

With the mere object of providing additional room, this adaptation of the chapter-house might perhaps be practicable, but, apart from other considerations, it would be, in our opinion, a grave mistake to disturb the associations and distort the proportions of that most interesting building by diverting it to such a purpose. It is, in fact, a council-room of the State, and might at any time be so used without the leave or interference of the authorities of the Abbey. More than three centuries ago it had passed entirely into the control, and was held as the exclusive property, of the Crown; and the clergy and officers of the Society of Deans and Canons, founded by Queen Elizabeth, have from that time to the present had neither responsibility for nor control over its fabric or the uses to which it had been devoted.

The chapter-house may therefore be considered as being virtually unavailable for the purposes of a monumental chapel, nor is it probable that the approval of Parliament would be given to any scheme which would involve interference with the grace and dignity of its interior, or with the completeness and uniformity of its outward aspect. These observations to some extent apply also to two other plans which were submitted to us; one by the late Mr. Edward J. Tarver, F.S.A., who proposed to build a "wreath of chapels" between the buttresses surrounding the chapter-house, with an entrance porch common to those chapels and the Abbey church. Such a treatment would, in our opinion, entirely change and destroy the character and charm of this ancient and picturesque edifice. The details suggested by Mr. Tarver will be found fully set forth in his evidence.

The other, which is one of four distinct parts of an extensive and costly scheme laid before us by Mr. J. Pollard Seddon, on behalf of himself and Mr. Lawrence Harvey, is almost identical with the suggestions of Mr. Tarver. It is described by its authors as a design for "a cloister of six chapels surrounding the chapter-house. These chapels might be approached from the Abbey through the doorway of Poets' Corner, or through the chapel of the Pyx, which might be opened up by arches in the south-eastern corner of the cloisters." In the opinion of Mr. Pollard Seddon these chapels "would materially improve the exterior effect of the chapter-house," an opinion in which we are unable to concur.

3. *Acquisition of Site and Erection of Cloister or Chapel to the East and South of Poets' Corner.*

A "ground plan of the Abbey and the Abbey buildings," appended to the report, shows that the space between the boundary of the precincts represented by a line on the south-east of the Abbey itself, and a straight line drawn from north to south along the west side of the great cloister, and produced through the dark cloister to Little Dean's Yard, encloses several important features of architectural and antiquarian interest. In addition to the chapel of St. Faith, the chapter-house, with its vestibule and the chapel of the Pyx (the ancient Treasury of the kingdom), all of which are more or less incorporated with the south transept, the area in question

contains the site of an ancient bell tower, the little cloisters, to which several prebendal houses are adjacent, the remains of the ancient infirmary, the Norman cellars under the ancient dormitory, and the site and ruins of St. Catherine's Chapel, whilst just outside the first-mentioned boundary line stands an ancient square tower known as the Jewel House, once no doubt an appendage of the Abbey, but which passed more than 500 years ago into the possession of the Crown, and was used for centuries as the Parliament office or depository of the statutes of the realm. A range of comparatively modern and uninteresting dwelling-houses and stabling, forming the west side of Old Palace Yard and Abingdon Street, flanks this group uninterruptedly from Poets' Corner to Great College Street.

The removal of the houses in Poets' Corner and Old Palace Yard, in addition to, say, the first four houses of Abingdon Street, would unmask the whole of the important area within which the above interesting features are comprised, and would reveal the Abbey structure and its appendages from a point of view whence they have not been seen for centuries. Such an extensive demolition would doubtless involve grave considerations of expediency and expense, which it is not necessary for our present purpose to discuss, but we have found no difference of opinion as to the pressing need which exists for the clearing away of some of the modern buildings in the immediate neighbourhood of the church, if for no other reason in order to keep it safe from the danger of fire.

The first in order of date of several proposals which have from time to time been made for the erection of a building on the south-east site was that of Sir Gilbert Scott, and formed part of his before-mentioned report in 1854. He suggested "a wide and lofty cloister of great length" to be erected at the back of the present houses in Abingdon Street, and to extend nearly from Poets' Corner to College Street. It is clear, however, that whilst the cloister might, in the words of Sir Gilbert Scott, have been made to form "one of the most striking and interesting buildings of its class," it would bear but a remote relationship to the Abbey itself, from which it would be separated by a distance of several hundred feet at the nearest point. Again, the prompt removal of all the houses in Abingdon Street, Old Palace Yard and Poets' Corner would seem to be the necessary corollary to the adoption of the plan, at a cost which must at once put it out of the question. It will be remembered that the primary object was, in Sir Gilbert Scott's opinion, the wholesale and immediate transfer of monuments and memorials from the nave and chapels of the Abbey. The proposed cloister was in fact to be a lumber-room. Certain it is that the scheme, having been submitted to the Chancellors of the Exchequer of two successive Governments in 1854 and 1855, was not dealt with.

In 1857 the same idea was again embodied in a plan submitted by Sir Gilbert Scott with reference to the improvement of Westminster; but, possibly for one or other of the foregoing reasons, it proceeded no further. In 1863 Sir Gilbert Scott was a witness before the Thames Embankment Commissioners, and in his evidence he once more submitted his scheme, but in a somewhat different and much enlarged form. In 1854 and 1857 he had proposed the pulling down only of the houses in Old Palace Yard and Poets' Corner, together with the mews at the back of Abingdon Street, leaving intact for the time the houses in the latter street. In the suggestion put before the Embankment Commissioners he further urged that the whole of the Abingdon Street houses should be swept away, and that a new cloister should be erected to the south of and in line with the Old Jewel Tower. The façade of this structure would have been directly opposite to the Houses of Parliament, and to the open space occupied by the garden and embankment on the south side of the Victoria Tower. This scheme, viewed as a metropolitan improvement, by clearing the whole of the space east of the chapter-house and south of the chapel of Henry VII. as far as the Jewel Tower, would have left the chapter-house and the south-eastern angle of the Abbey buildings fully exposed to view, and would have shown the Houses of Parliament on the east and the Abbey Church with its precincts on the west separated by an open space of magnificent proportions. With regard to the proposed cloister, however, in Sir G. Scott's scheme of 1863, it would have been even less connected with the Abbey Church than in his earlier proposals. The distance from the nearest door of the Abbey would have been about 500 feet, and the cloister itself would not have been "articulated on to the Abbey" in any way. In their report the Embankment Commissioners recommended that all the dwelling-houses should be taken down, saying nothing, however, about the scheme for building on their site, but, on the contrary, recommending that the ground so cleared should be left open.

Although the need became more pressing year by year, the subject appears as a public question to have lain dormant from 1863 down to the year 1881, when Dean Stanley, who had during the interval brought it to the notice of successive Governments, made it the occasion of frequent communications with your Majesty's Office of Works, with the view of enlisting the interest of that Department in the matter. The removal of the old Law Courts from the west side of Westminster Hall was at that time occupying the attention of the Office of Works, and the removal of the buildings on the south and south-east of the Abbey, being a cognate topic, the First Commissioner, Mr. Shaw Lefevre, in considering the question of clearance, took occasion to invite public attention to the existing proposals of Sir Gilbert Scott. The result was a series of representations from the late Mr. Fergusson, partly by way of criticism and partly by way of novel suggestion. Mr. Fergusson expressed his opinion that "no architect that ever lived could render a long unbroken one-storeyed building worthy of the situation," namely, a site facing Old Palace Yard, 200 yards wide, and directly opposite to the Houses of Parliament and the Victoria Tower with which the new building would be in competition. In addition to objections which he suggested on artistic and financial grounds, Mr. Fergusson pointed out that the cloisters, or Campo Santo, of Sir G. Scott, never could be made an integral part of the Abbey, nor even seem to be in direct connection with it."

As an alternative plan Mr. Fergusson then suggested what he termed a new south transept—in other words, a building in more or less immediate contact with the existing south transept, and so arranged as "practically to form part of" the Abbey. In order to secure a site for this structure "it would be necessary to pull down the houses on the west side of Old Palace Yard, and those which encumber the Abbey in Poets' Corner. Beside this, some second-class clerical residences on the site of the old infirmary and St. Catherine's Chapel must be removed."

In 1884 the question was brought to the notice of the Government. A change of Government followed soon afterwards, and the matter remained in abeyance until 1886, when a committee consisting of a number of eminent persons was formed for the purpose of considering it, and held several meetings in the Jerusalem Chamber. This committee recommended the erection of a monumental chapel as a memorial of the Jubilee celebration, and suggested that in such a chapel might be grouped together the monuments of statesmen connected with the present reign, so that the Abbey might be relieved, to some extent, from the existing congestion.

In 1888 the committee was reconstituted, and its numbers were increased. Under its sanction a Bill was prepared in order to obtain compulsory powers for the acquisition of the houses in Old Palace Yard and Poets' Corner, with a view to the promotion of a scheme shaped on the lines of Mr. Fergusson's suggestions.

Although less vast than Sir G. Scott's plan, the "new south transept" scheme of Mr. Fergusson would have been extensive and costly. "It would have provided space for monuments very much larger than the existing nave of the Abbey. It would have involved the removal of the houses in Old Palace Yard on the west side, and it would have involved the removal of the canons' houses on the east side of the little cloister. It would have gone up to the college garden, and it would have been behind the Jewel House."

The scheme proposed by the Bill of 1888 was accordingly a modification of Mr. Fergusson's plan. It was not nearly so extensive, and it preserved the leading "idea" of the latter, namely, the device of securing direct communication with the Abbey by means of a cloister or passage carried round the chapter-house through the flying buttresses. Opposition to the proposal came from different quarters. The Society of Antiquaries pointed out that it would involve the destruction of the ruins of St. Catherine's Chapel, as well as of a portion of the ancient wall enclosing the Abbey precincts, which may still be seen almost touching the flying buttress of the chapter-house on the east. In the face of the opposition, the Bill was dropped.

It had been estimated that Sir Gilbert Scott's latest proposal, which involved the removal of all the houses from Poets' Corner to the south end of Abingdon Street, would have cost some 250,000*l.* for the demolition of house property alone, exclusive of a vast outlay in building the proposed cloister. The authors of the Bill of 1888 reckoned, on the other hand, that their scheme, including the acquisition of the site and the erection of the chapel, would not have cost more than 160,000*l.* On its abandonment, the promoters took counsel with Mr. Pearson, the architect to the Abbey, with a view to the preparation of a fresh plan, which would as far as possible disarm the threatened opposition. An alternative design was prepared by Mr. Pearson, which, while it still preserved the idea of access through the flying buttresses of the chapter-house, would leave the ruins of St. Catherine's Chapel, as well as the dwelling-house, No. 5 Old Palace Yard, untouched, and which might be carried into execution at an outlay still further reduced. The total expenditure was estimated by Mr. Shaw-Lefevre at 70,000*l.* or 80,000*l.*

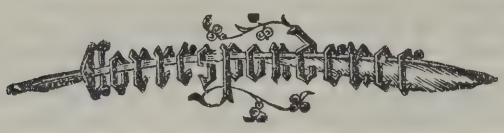
The details were described by Mr. Pearson himself in his evidence before us, and were illustrated by a ground-plan. He proposed that a "monumental chapel," facing east and west (instead of a "transept" running north and south, as suggested by Mr. Fergusson), should be erected on the site occupied by

Nos. 2, 3 and 4 Old Palace Yard, and the ground at the rear of those premises up to the boundary line of the Abbey precincts. This chapel would also be approached from the Abbey through a corridor leading from the door at Poets' Corner, and carried through the flying buttresses of the chapter-house.

(*To be continued.*)

GLASGOW ARCHITECTURAL ASSOCIATION.

ON Saturday the 27th ult. a party of members visited Bothwell Castle, special permission having been granted by Lord Home. Interest in this grandest of Scottish castles was heightened by the knowledge that recent excavations have made considerable additions to its extent. The party was met by an estate official and courteously conducted over the ruins. In one of the apartments was seen a large number of stone shot recently unearthed. The excavations have discovered the twin towers that guard the drawbridge and form the main entrance. There is another circular tower of like size at an angle of the great wall which marks out a space almost double of that formerly assigned to the courtyard. Many disinterred relics were also shown, such as axe-heads, tiles, horn and various metal implements.



Cutler v. North.

SIR,—It is but fair, I think, to the profession and Mr. Cutler to state that in opposition to the expert evidence given by those Fellows of the R.I.B.A. who appeared for Colonel North, Sir Arthur Blomfield, A.R.A., V.P.R.I.B.A., Sir James D. Linton, P.R.I., Mr. Thomas Harris, F.R.I.B.A., and myself were in Court prepared to support emphatically the plaintiff, but it was not thought necessary even to ask for our evidence.—Yours faithfully, ROBERT W. EDIS, F.S.A., F.R.I.B.A.

The R.I.B.A. Council.

SIR,—Being in a rather critical frame of mind and being a great admirer of ancient architecture, I have asked myself on reading the list of names whether the public, if it were asked, would acknowledge that it is worthily represented. For I presume I am right in thinking that the first duty claimed by the R.I.B.A. is, under critical circumstances, to look after the interest of the public so far as it is connected with the architecture of the day. Now and then, as we know, the Council advises the Government to do, or not to do, this or that, sometimes without being even asked for its opinion. The Institute considers it has a mission and acts accordingly. I sincerely hope that it is satisfied with the weight of its opinion and is able to give sufficient proof of it by examples of the acceptance of its advice, *i.e.* the advice of its Council. And I suppose the profession generally—outside as well as inside the Institute—has an interest in the character of the Council, for if it interferes with an architect's work the effect should be so decided that he would not for a moment think of appeal or protest, even if an outsider of the Institute. Now, Mr. Editor, you will see at once that I should not be writing this letter if I thought the Council was what, under the circumstances I have referred to, I considered it ought to be. The eighteen gentlemen are liable to be called upon at any moment to exercise what must be allowed to be the very highest function in the profession. It would show the degree of respect the Council is entitled to if the President of the Institute would say how many of the eighteen he would propose for the royal gold medal when next it is to be given to a British architect who, to use his own words, "may have designed or executed a building of high merit, or produced a work tending to promote or facilitate the knowledge of architecture or the various branches of science connected therewith." I admit there are high-class specialists among the eighteen, and it is clearly proper that they should be there; but the rest, the majority, should be men of larger calibre, instead of, with two or three exceptions, smaller calibre. Where in the list are the Barrys, Cockerells, Smirkes, Fergussons? Then if the Council claims to act for the public, should there not be two or three well-known public men upon it as a means of giving general confidence in its acts?

PRO BONO PUBLICO.

Members of Council (18).

The following candidates are elected:—Thomas Edward Collcutt, 428; Ernest George, 406; John Slater, B.A. Lond., 391; Thomas Blashill, 389; John Belcher, 387; James Brooks, 382; Wyatt Papworth, 373; William Emerson, 370; Alexander Graham, F.S.A., 365, and R. Phené Spiers, F.S.A., 365; John McKean Brydon, 356; R. Herbert Carpenter, F.S.A., 325; John Holden (Manchester), 315; Leonard Stokes, 298; Octavius Hansard, 295; John Alfred Gotch, F.S.A. (Kettering), 290; Edward Augustus Gruning, 289; and Lacy William Ridge, 259.

Extinction of the Architectural Association.

SIR,—I agree with very much Mr. Farrow says in his letter, or I may rather say that he agrees very much with mine. It is quite true that the Association has been constantly developing, and my grievance is that, instead of further development to meet the present needs, an entirely new institution is projected. I am not convinced of the attractions of the Association under the new scheme. It may be the nucleus of the lyric club, string band, camera club and other institutions, doubtless good in their way, but hardly the work of an architectural association; and useful as the lending library has been, I doubt, with the advantages of the Institute lending library available for members (which those passing the examination will become in due course), whether this added to the entertainments and meetings will be sufficiently tempting to retain members paying an increased subscription. As to the financial aspect of the Association, it is quite true there has been a gradual diminution in the available assets, although not in the income, but the expenditure has increased in consequence of the large sums of money expended in entertainments and grants.—Yours obediently,

June 30, 1891. J. DOUGLAS MATHEWS.

International Congress of Hygiene and Demography.

SIR,—It is proposed during the Congress to hold, in connection with Section IV. (architecture in relation to hygiene), an exhibition of drawings of sanitary construction. The committee of this section will be glad to hear from members of the architectural and engineering professions in respect to any drawings they may be willing to contribute. The drawings should necessarily be of a constructional and practical character, and include such subjects as foundations in relation to ground air and dryness, drainage, water supply, lighting, heating and ventilation. It is proposed to exclude perspectives, except bird's-eye views intended to show the disposition of the buildings. The drawings will be exhibited from August 10 to 17, in the library of the University of London, which will be the reception-room of the Congress. The committee reserves the right of making a selection from the drawings, if necessary, and will be greatly obliged by an early response from intending exhibitors.—Yours faithfully,

THOMAS W. CUTLER,
Hon. Sec. Exhibition Sub-committee.

5 Queen's Square, W.C.:
June 1891.

GENERAL.

The Late Mrs. A. Rosette Robertson, of Brighton, has bequeathed to the trustees of the National Gallery fourteen pictures. Amongst the pictures are the Holy Family by Andrea del Sarto, a landscape by Philip Wouvermans, a portrait of Princess Mary of Orange by Sir Peter Lely, a female Saint by Guercino, and portraits by C. Jansen, Van der Helst and C. Van Savoye.

The Death is announced of Mr. W. N. Blair, in his fiftieth year, at Wellington, New Zealand. Mr. Blair was a member of the Institute of Civil Engineers, and Engineer-in-chief and Under-Secretary for Public Works, New Zealand.

The Hampshire Field Club last week made an excursion to Bishop's Waltham. The ruins of the ancient palace of the Bishops of Winchester were visited by permission of Sir William Jenner, who has recently carried out some extensive excavations, laying bare the site of the ancient chapel.

The Annual Meeting of the Incorporated Association of Municipal and County Engineers has just been held. There are 403 members, representing almost every important town in the kingdom. Mr. T. De Courcy Meade, of Hornsey, is president.

Captain Shaw, C.B., chief officer of the Metropolitan Fire Brigade, has decided to retire, and has placed his resignation in the hands of the Fire Brigade Committee of the London County Council.

The "Glasgow Herald" says:—Mr. P. Macgregor Wilson, R.S.W., has been during the past few months making a tour through Persia in search of new subjects for transference to his canvas. In the course of his wanderings he has had commissions for portrait-painting, including that of the Governor of Shiraz. A more important commission, however, was that to paint a portrait of the Shah, and this we learn by a telegram received from the artist he has just successfully completed.

The Architect.

THE WEEK.

As Holbein's picture which was purchased out of the Longford Collection is not visible to the ordinary visitor, who is especially eager to gaze upon the latest acquisitions of the National Gallery, it is no wonder there should be grumbling and hints that the picture was being submitted to mysterious operations in some secret part of the building. The explanations of Sir F. W. Burton should, however, be enough to still the agitation of the angriest of the disappointed visitors. The picture was to be seen in the National Gallery for about three months of last year. But it could not be allowed to remain for a longer period, as it had first of all to be parquetted, or strengthened at the back by cross-timbering, the only method by which pictures painted on panel can be secured against future splitting and warping. In the second place, the heavy coats of discoloured (in parts opaque) varnish, which had long obscured its original brilliancy and neutralised its true colouring, had to be removed. Glazing would, of course, follow the completion of these processes. Owing to the length, severity and gloom of last winter the work was arrested. When the process of parquetting had been at length brought to a close that of devarnishing had to begin, a most laborious and tedious one, demanding the utmost patience and care. In the present instance it was further prolonged by the temporary illness, from influenza, of the restorer. And it may easily be conceived that such an operation cannot be entrusted to every one or any one, or be performed by deputy. Although he is too cautious to promise, Sir F. W. Burton expects that the picture will again be on view in about a month. It appears that the process which had to be gone through has turned out triumphantly successful. This great and most important production of Holbein's pencil, which had sustained surprisingly little injury, is now revealed in that clearness, daylight brightness and transparency which characterise the master's works. Minute delicaciesof finish have also come to light, which can only be found elsewhere in the works of John van Eyck and Albert Dürer.

The annual meeting of the British Archæological Association will be held at York during the week from August 17 to 23. The Marquis of Ripon will preside, and the vice-presidents will be the Bishops of Ripon and Wakefield, Lord Herries, the Dukes of Norfolk and Cleveland, and the Marquis of Bute. The first two days will be employed in an inspection of the cathedral, the city walls, the city churches and the remains of St. Mary's Abbey, with its ancient Hospice, and its museum of Roman antiquities. A day will be spent in a visit to Beverley Minster and the ancient city of Hull; another will be devoted to Ripon and Fountains Abbey, where the party will be entertained by Lord Ripon, and an examination of Selby Abbey Church, the Abbeys of Rievaulx and Byland, and the Collegiate Church of Howden will occupy two days. On the first evening the members will be entertained at a conversazione at the Mansion House by the Lord Mayor of York, and on each of the other evenings meetings will be held in the new Guildhall for the reading of papers, to be followed by discussions. The members of the congress will attend service in York Cathedral on Sunday, and Monday, the 24th, will be spent in a railway excursion to Scarborough, where the party will visit the old Norman Castle and the parish church of St. Mary.

A memorial from men of science and others on the subject of the proposed site for the National Gallery of British Art has been forwarded to the City Corporation through Sir H. E. Roscoe, M.P. They state that, having heard that there was a possibility of the City of London finding a site on the Embankment for the gallery which a munificent donor had proposed to build, they approach the Corporation with an earnest request that they would observe the very great importance of giving effect to the proposal. The memorial already presented to the Prime Minister would have made the Corporation aware of the many strong objections from the scientific point of view to the site suggested for the gallery in the first instance. The greatest city in the world must be the first to suffer if from any cause the proper presentation of science and means for its study by its citizens were in any way crippled. By affording a site on the Embankment, the Corporation would be the means of preventing this lamentable result, and they would earn the gratitude of all interested in scientific progress, as well as confer a great boon on the art-loving public.

The Liverpool Corporation have had a wearisome experience of the difficulties which attend the carrying out of works for water-supply on a grand scale. After obtaining the Act there was a dispute among the engineers, and Mr. Thomas Hawksley found it necessary to retire. The various mishaps attending the attempt to lure the impounded water of Vyrnwy from its picturesque sources into Liverpool need not be again mentioned, but a later incident seems to have considerably taxed the patience of the inhabitants. It is thus described in one of the local journals :—The pipe line has just been completed, and water from Vyrnwy is now being discharged into the storage reservoir at Prescot. None of the Vyrnwy water, however, has yet reached Liverpool. At the meeting of the Water Committee it was stated that, whilst from five to six million gallons daily are being discharged into the pipes at Vyrnwy, less than two million gallons reach their destination. The assumption is that the balance of about four million gallons is lost by the way, it is supposed in the Mersey, from the temporary pipe line, with flexible joints, laid on the bed of the river. Mr. Parry, the water engineer, declined to hazard an hypothesis as to the cause of the defect. Mr. Deacon, he thought, who had charge of the work, had better explain it himself. Mr. Deacon's time is at present taken up in examinations before the arbitrator, and it was not thought well to add to the burdens already on his shoulders. The committee decided to wait till Mr. Deacon was at liberty to discuss the subject. One member expressed his opinion by saying that, though not an engineer, he could have done the work better himself. The town clerk, however, had corresponded with Mr. Deacon, and the latter stated he knew that some of the hydraulic valves would leak, but that in a few weeks they would become tight. The Liverpool taxpayers must derive what consolation they can from the statement.

The Cambridge Syndicate for Local Lectures has issued a detailed programme of courses of study arranged for such of the Extension students who choose to spend a month at Cambridge in the vacation. Practical work in laboratories and museums has been arranged in each of the four sciences—chemistry, physics, physiology and geology. The two art courses are also promised to be illustrated by the valuable collections of casts and engravings in the Cambridge museums.

One of the Governmental problems which await solution in Paris relates to the factory of Sèvres. When France was a monarchy or an empire a State pottery was a necessity. What more pleasing present could be offered to a king or a prince than a vase in the production of which the best artists and potters co-operated? Works of the kind were serviceable helps to French diplomatists. But Government is now carried on under different conditions, and it is doubtful whether a gift of Sèvres pottery would always be accepted with satisfaction. By one of the fictions which pass among courts, a French king could be accepted as being the real inspirer of everything good that came from the factory, but by no effort of the imagination could anybody suppose that M. Grévy or M. Carnot furnished ideas to artists and craftsmen. On the other hand, the authors of the works are ignored, because officialism will have it so. Carrier-Belleuse was such a director as does not appear once in a century; his models were exquisite compositions and he had the faculty to bring out the talents of his assistants. But we doubt if one of his designs has been carried out by his successors. Another style found more favour with the official world. Under these circumstances the *raison d'être* for keeping up the Sèvres factory is no longer manifest. Work that looks as well is to be obtained at an infinitely lower price from potters who are independent of the State, and there can be no doubt the pieces would be as acceptable as those from a national factory.

PAINTING AT THE PARIS SALON.

By Paul Leroi.

HAVING always avoided complaisant criticism, it is too late to begin with it now; and I am therefore forced to declare that painting in France is at the present time passing through a crisis which is one of the signs of decadence. Of this fact there could hardly be stronger evidence than was afforded by the Salon exhibition which has just come to an end. I have no hesitation in saying that among the seventeen hundred and odd paintings which were to be seen there was only one which, from its masterly qualities, is likely to be assured of immortality. This work is the *Portrait of Cardinal Bernadou, Archbishop of Sens*, by M. Elie Delaunay, one of the members of the Institut. It was the only contribution of the painter to the exhibition, but in the eyes of experts it stood apart, and all other works were relegated to inferior positions. The success of the portrait could not be a surprise to anyone who followed the triumphal career of the artist, who is one of the most modest of men, for he lives for art alone, and does not care a jot for the applause of the crowd. The Cardinal is represented standing, and of course is clothed in scarlet. He holds his biretta or cap in both hands, and is about to advance along a red carpet towards the entrance to his cathedral. The background is formed of crimson drapery, on which the arms of the prelate are emblazoned. The painting might be described in the jargon of the day as a symphony in red major, and it will be evident that the master has created difficulties in order that his power might be shown in overcoming them. It is only a great colourist who could venture on such a work, and in this case the artist's science is manifested in every touch. But the portrait is also marked by that superb style which characterises the works of M. Elie Delaunay, with the insight and intensity of concentration which qualify him to rank with the great masters of a past age. The treatment of the head and hands of the subject seems almost a revelation of character. We can see a strong intellect combating with physical weakness. The hands seem to tremble, the body to bend beneath the load of responsibility as of years; but that the will is strong enough to overcome all obstacles is suggested by the movement of the head, the expression of the eyes, and the firmness of the lips. There can be no doubt that M. Elie Delaunay is the most illustrious among contemporary portraitists. He has the gift to confer immortality on his subjects, for their "counterfeit presentments" seem as if they retained the power of thinking. They are not only animated, but intelligently animated.

There are other artists who are more esteemed by Frenchmen than M. Elie Delaunay. This is in a great measure owing to his aversion to coteries and laudations of all sorts. As becomes a great man, he is indifferent to honours and wealth. Art, and art only, monopolises his faculties and devotion. So long as he is allowed opportunities to exercise his genius he is satisfied, and knowing the value of his works, he has philosophy enough to wait for the time when his countrymen will be advanced enough to appreciate them. And yet among those works are some in which the highest decorative skill vouchsafed to this age is displayed. Hereafter his native city, Nantes, will be proud of such a son, and the Murrays, Baedeckers and Joannes will counsel tourists about the value of his paintings to be seen in churches and elsewhere. In Paris, also, there will be amazement when it is discovered that in the part of the Palais Royal used by the Conseil d'Etat there are works by Elie Delaunay which cannot be too much admired, and that there is also a ceiling in the *foyer* of the opera-house by him, which eclipses the neighbouring works by the late Paul Baudry, admirable as are the latter. Among the crowds who visit M. Charles Garnier's building, how many people are there who have heard of M. Delaunay? General opinion attributes all the works to Baudry, and, as history is generally so written, it will be long before the truth is admitted. Fortunately, M. Elie Delaunay's superiority was once formally recognised. At the International Exhibition of 1889 by a unanimous vote the highest of all the awards was assigned to the artist, and this testimony of the world's esteem should be a compensation for the ignorance and indifference of so many of his countrymen. On the same occasion I had also one of the great satisfactions of my life in finding that the English painter, Mr. Orchardson, was also the recipient of a gold medal.

There were other portraits in the Salon which obtained more praise from the Paris critics! However, M. Benjamin Constant's portrait of his wife, the daughter of M. Emmanuel Arago, the French ambassador at Berne, does not become a masterpiece, because the attitude brings to mind Reynolds's portrait of *Mrs. Siddons* in Grosvenor House. Even if the relationship to the English work were less apparent, there are defects of modelling and treatment which should not be found in a work by a talented painter. It is not easy to imagine why two artists who are members of the Institut, M. Falguière and M. Gerôme, should be travestied under the pretext of revealing how they set about work in their ateliers. The representations are feeble to excess. M. Bonnat's single portrait, *Mme. A. C.*, is treated in the manner always adopted by this artist, that is to say, there is a sort of smoky background which may vary according to the colours employed and the accidents attending the composition of medleys, but is always oppressive. From this ground the head is made to stand out *en clair*. This sort of treatment I consider to be anti-artistic, and would reprove it, but it would be unjust to overlook the fact that it has been employed by M. Bonnat conscientiously and with perseverance. It suits such talents as he possesses and which he employs more successfully in portraiture than in historical or religious subjects. For example, M. Bonnat's *Youth of Samson* depicts the Hebrew as an easy victor of a lion that seems formed of caoutchouc, and therefore in a docile way assumes the attitudes of the circus.

The only portraits besides that by M. Delaunay already described which were worth attention came from strangers, and reference may be made to two among them. Mr. James Guthrie, of Glasgow, sent two works which had been exhibited in Scotland, *Rev. Dr. Gardiner* and *Mr. George Smith*. The latter shows a gentleman well mounted, the horse being skilfully painted and forming an *ensemble* that French cavaliers could not fail to admire. The treatment was worthy of the subject; the handling was bold without being coarse, and the colour was robust and harmonious while appearing subdued. Mdlle. Thérèse Schwartze, of Amsterdam, has a virile talent, which I am glad once again to notice. This lady uses the pencil with power, and may be said to have followed the English academician's advice in mixing her colours with brains. Her palette is varied, but a vigorous sobriety is the result. One canvas the portraits of two children, *Didy Chouchou and Paschol*, testified to the qualities of the artist, but they were seen with even more completeness in the energetic figure of *Commandant Général Piet Joubert, du Transvaal*.

It would probably be considered erroneous to class M. Michel de Munkacsy among the strangers who have triumphed over Frenchmen in the last Salon, for the unbounded praise bestowed upon him has, like the fumes of some overpowering incense, made his energy dull while captivating his senses. Last year the artist exhibited a ceiling-painting that was as feeble as it was enormous. This year his decline was more strongly marked by his *Portrait de Mme. B.* The interior in which the lady forms an item is essentially vulgar, and was not worth the representation; the modelling of the figure is surprising from its defects, and a more commonplace scheme of colour could hardly be devised. M. Munkacsy does not appear to become conscious of his defects, but as a man of business he must perceive that the public appear to grow tired before the colossal canvases filled with masses of immature figures, and accordingly he has shrewdly turned back to the Hungarian subjects which first gained him repute as a painter. He cannot be considered to have gained success by his latest attempts. The picture in the Salon represented the interior of a cabaret, with a fiddler playing, and hence the title, *L'Air favori*. The handling is heavy, and the painter employed the darkest combinations of his palette, and hence the general effect was of inkiness.

If M. Munkacsy did not succeed this year, there was compensation to be found in the works by other foreigners, which, indeed, were among the best in the Salon. While French painters of *genre* are yearly losing more and more of

that spirit which gave attractiveness even to mediocre works in the last century, an English artist, Mr. Frank Brangwyn, in his *Un Enterrement à Bord*, displays an intensity of sentiment which is exempt from all exaggeration. One of his compatriots, Mr. Chevallier Taylor, has been no less successful in *The Last Sacraments*. The tonality is somewhat too uniform, but one must ignore defects of technique while admiring the truth to nature which is apparent in all the figures, the pathos which is imparted to the dying youth and the conflicting emotions of the relatives. There is dignity also in the figure of the humble priest, who holds up the crucifix as if he could overcome death and change the final struggle into a victory. It is no secret that the Governmental Commission appointed in France to discover those works which merit to be purchased out of the public funds was arrested by this remarkable work; but the Directeur, who, although a clever writer, is a novice in regard to much that relates to art, declined to approve of the proposal, and France thus loses a work which could impart many a lesson to painters.

The *Departure for the Fishing-Ground*, by an American, Mr. L. P. Dessar; the *Plain Song*, by his countryman, Mr. Walter Gay; the *Hospice for the Aged, Brussels*, and the *Refectory*, by Mdlle. Heyermans, of Rotterdam; *The Viaticum*, by Mr. Middleton Jameson, of Edinburgh; the *Maternal Instruction* and *The Dream*, by Mdlle. Klumpke, of San Francisco; the *Shepherd's Friends*, by Mr. Ridgway Knight, of Philadelphia; the *Portrait* and *With the Burgomaster*, by Mr. W. MacEwen, of Chicago; the *Civil Burial*, by Mr. C. Sprague Pearce, of Boston; and the death of *La Fille de l'Aubergiste*, a fine picture by M. Roeseler, of Hamburg, deservedly attracted the attention of connoisseurs, and if compared with such French works as *Le Cordon Bleu*, by M. Vibert, and the *Whist Party*, 1805, by M. George Cain, would demonstrate how great is the falling-off among French painters.

If the *genre* subjects in the exhibition which came from Frenchmen presented a pitiable spectacle, what is to be said of historical paintings, religious paintings and examples of decorative art? The last branch was upheld in the exhibition mainly by (1) M. Raphael Collin, whose *Ceiling-Painting for the Foyer of the Odéon* was beneath criticism, although corresponding with the style in vogue in the Direction des Beaux-Arts, and when set up will destroy the effect of the fine architectural lines of the foyer; (2) by M. Gabriel Ferrier, who, under the title *Glorification des Arts*, has executed a ceiling-painting for the French Embassy at Berlin that abounds in heresies and banalities; (3) by M. Jean Paul Laurens, whose very big canvas, *La Voûte d'Acier*, has been commissioned for the Hôtel de Ville, Paris. The last work, which deals with one of the preliminary episodes of the French Revolution, is as dull in effect as so many yards of wall-paper. It naturally recalls the charming work by Mr. Orchardson, *The Queen of Swords*, but there is a vast difference between the two in principles of treatment. The English painter has given animation to his figures—one can almost hear the rapiers clash—while M. Laurens, on the contrary, represents the municipal authorities who await Louis XVI. as impassive as so many footmen or operatic auxiliaries. The whole affair appears to bore them, and before such a puppet king as is introduced by the artist it would, perhaps, be difficult to become enthusiastic. A more depressing picture could hardly be imagined.

The vast works which seem like exaggerated chromolithographs, called *La Mort de Babylone* (M. Rochegrosse) and *Mort de Sardanapale* (M. Chalon), cannot be ranked among the historical paintings, and the less said about them the better it will be. It is sufficient to remark of them that they recall the pictures produced so abundantly by the late Gustave Doré, and which were disastrous to his reputation.

As respects the paintings of religious subjects, I must own that I did not participate in the welcome that was given to the *Saintes Maries* by M. P. J. Gervais. There was tact in taking a subject which suggested that the Holy Women of Jerusalem were in a miraculous way transported to the swamps of Provence. But the figures had not that severe correctness which should be characteristic of such a work. This was especially apparent in the woman who is shown as leaving the boat.

M. Henner's mannerism was this year more obtrusive than ever. He has not of late fixed his aspirations very high, for his patrons are easily pleased, but the *Pieta* is below even his average. The picture looks as if executed in "cirage," and one seeks in vain for a trace of skilful modelling. The two pictures, *Judith* and *Magdalen*, by an Italian lady, Mdlle. Juana Romani, of Velletri, who is a pupil of M. Henner, serve as a commentary on the master's manner. Left to herself the artist might have gained some reputation, but she has preferred to make pastiches, and her paintings have a curious interest, for we can see how readily the qualities of M. Henner's works are to be imitated by young people.

If, unhappily, France no longer possesses a Corot, a Rousseau, a Diaz, or a Dupré, she still, however, has conserved a band of landscapists that are exceptional, for, contrary to the general law which now prevails, they grow stronger from year to year. One of the latest additions to these lovers of nature, M. Quignon, by his *Aftermath* has further exemplified the advantages which arise from a frank and independent observation of country scenes. Already he has found an imitator in M. Rigolot, who would, however, do better if he avoided looking at nature through other men's eyes. MM. Yon, Casile, E. Martin, Petitjean, Jan-Monchablon, Jacomin, worthily maintained their reputation by their works in the last Salon. M. Français, who seemed last year to be retrograding, like so many artists, in this year's exhibition was himself again in *Une Source: le Soir*, which was admirably designed; but, as is not uncommon with the painter, was not brilliantly painted, for his palette is wanting in vibration. M. Isenbert, of Besançon, is a modest artist who has never quitted his native place, yet he has made much progress, and at this last Salon he gained a legitimate and unquestionable success by his *Morning on the Doubs* and *Spring in the Environs of Besançon*. I am very glad to have the opportunity to record the fact, for one of the misfortunes of France is that the provinces are becoming depopulated of artists, and the change is supposed to be for the advantage of Paris, whereas the city is encumbered with painters. M. Camille Bernier's *Evening in Brittany* and *Britton Farm* showed in parts that the artist's recent illness was not without its effects on his hand, and it would be more just to await another exhibition, in which it is to be hoped the artist will reassert himself. Each Salon exhibition gives connoisseurs new opportunities to quicken their interest in the works of M. Bellel, who is recognised as a genuine master of landscape, although the crowd are unable to appreciate his austere style, which seems to be produced regardless of all ephemeral applause. His *Souvenir of Provence* and *The Ravine of Chateldon* are superb, producing an impression of grandeur in the mind of the spectator.

For the first time I saw this year at the Salon two paintings by M. Henri Zuber, which have disappointed me. His *Pasture at Bendorff* and *End of the Season, Barbizon*, are two complete errors. Knowing the value of the artist, I could not believe there was any decline of power. I then discovered that M. Zuber had been commissioned to execute two landscapes of a decorative sort, illustrative of summer and winter, for reproduction in tapestry at Beauvais. Having sought out the artist and told him my opinion of his works in the Salon—which coincided with his own—I was able to see the *Summer* and *Winter*, and have no hesitation in declaring them to be veritable revelations which, when seen by the public, will enhance the reputation of the Alsatian landscapist. Hitherto M. Zuber has been known as a learned and poetic interpreter of nature, but critics could not imagine the decorative feeling which he possesses and which qualifies him to be regarded as the inheritor of the best traditions of French art. In his tapestry designs M. Zuber has taken care to avoid any suggestion of easel pictures, and the authorities were for once well inspired when they gave him the commission. His aim has been to produce cartoons in which the modern sentiment of decoration should be adequately expressed, together with respect for ancient traditions. It will be an advantage if his cartoons can be sent to next year's Salon, where admiration will be sure to await them. M. Julien Dupré has shown of late a tendency towards monotony, for he rarely varies his subjects, and seems doomed to turn in a very circumscribed circle. This year he has agreeably

surprised his friends. He has made a new departure under most favourable conditions. His *Road at Mesnil* is illuminated with the rarest justness of effect; the perspective is excellent, the handling full of surety, and the *ensemble* is agreeable to all eyes. Henceforth M. DUPRÉ will be reckoned as one of the best of the French landscapists. An English landscapist, Mr. R. W. A. ROUSE, should not be passed over without recognition. His interesting *After the Shower* has much in it that recalls one of Mr. R. W. LEADER'S pictures in the Universal Exhibition of 1889.

"Still life" continues to have many devotees among French artists, such as MM. ROUBY, RIVIERE, BAIL, EUGÈNE CLAUDE, ATTENDU, BERGERET, DESGOFFE, and a true master, M. ANTOINE VOLLON. But in this field also foreigners are gaining ground, as may be seen from the examples by Mdlle. DE HEM, of Ypres, which are painted with power and refinement.

It would be impossible to notice the drawings, pastels, designs, &c., with any care, for the jury inundated the walls with a strange medley, in which many works were found that were unworthy of a public exhibition. The two that appeared to be supreme were portraits in fusain by Mdlle. BEAURY-SAUREL, which were remarkable for sobriety of treatment and discernment of character.

If in France, as elsewhere, *gravure au burin* is in a dying state, at least it can be said that for some time past praiseworthy efforts have been made to create a renaissance, which it is to be hoped may soon be an actuality, if it were only for the sake of able artists such as M. ADRIEN DIDIER, MM. ACHILLE and JULES JACQUET. At the present time it is etching that triumphs, and there can be no doubt that the etchers have displayed works this year in their Salon in which quality was joined to quantity. At the head is a master whose career has been marked by a series of successes. After making a name as a landscapist, M. THÉOPHILE CHAUVEL has etched his own and other artists' compositions. This year, for the first time, he attacked the figure, and has given a magnificent interpretation of the figure of GOETHE'S "Mignon," after a pastel by an American painter, Mr. JULES ROLSHOVEN, in which the features of the mysterious child are rendered as if they belonged to a girl from the neighbourhood of Florence. M. CHAUVEL has imparted elegance and delicacy to the figure.

Around the eminent aquafortist was a company of the artists who co-operate with him in producing the plates of *L'Art*, of which M. CHAUVEL is the artistic director, and their works display zeal and talent. M. LAGUILLERMIE justified the award of the Médaille d'Honneur last year by his very large plate, *The Young Duke*, after Mr. ORCHARDSON, and which denotes considerable progress in the art. There were also this year interesting examples of lithography and wood-cutting.

WIND-PRESSURE ON BUILDINGS.

A FEW years ago very pointed attention was directed to the question of wind-pressure, on account of an important railway structure being destroyed during a hurricane. Now, although as a matter of fact that work had been designed without any regard being paid to the probable effect of wind-pressure, it is not to be supposed that up to that time wind-pressure had been neglected by engineers, or that anything new was evolved during the investigation which followed the disaster. The result was to authoritatively confirm the opinion that 56 lbs. per square foot may be safely assumed as the maximum direct wind-pressure in the British Islands.

The resultant effect of this pressure upon structures of different classes will be varied according to the direction of its action and the mode in which it is resisted; thus it may be withstood by strength alone and become part of a load, or stability may also be an opposing force. If a work rocks under the action of consecutive gusts of wind a case may occur in which it must ultimately overturn if the wind action is maintained for a sufficient length of time, but this can only happen when the interval between the gusts of wind is equal to the period of one oscillation, to and fro, of the structure; then each oscillation will be widened by succeeding impulses until the point whence recovery is possible is passed. Lofty chimneys are most notably exposed to wind disturbance, and should therefore be carefully designed to withstand it. If executed in masonry it should not only be considered as a whole in regard to its stability, but also any length measured downwards from the cap towards the base must in itself possess the same stability as if it were an independent chimney, for the tensile resistance of the joints is not to be taken as of any value. If we consider any part of the chimney, from the cap down, its moment of stability will be equal to its weight multiplied by half its width or diameter, and this should be at least equal to twice the moment of wind-pressure, for the tendency of the wind is to tilt the brickwork and so bring its weight upon the edges of the bricks, which would be liable to crack off and so reduce the effective width of the supporting surface. The moment of wind-pressure on a square chimney will be calculated as the area of one side multiplied by 56 lbs., and by the height of the centre of gravity of the side area above the point of overturning. The pressure upon a round chimney is one-half of that upon a square one, of which one side is equal to the diameter of the former. When sheet-iron or steel is the material used in the construction of a high chimney, its weight will be insufficient to afford the requisite stability, and it must therefore be steadied by guy rods or wire ropes from the top, and if need be from various points in its height. This latter requirement will depend upon the transverse resistance of the chimney, for when held by the top guys the wind will act the part of a load on a hollow beam, and if its transverse strength is insufficient for its whole height—considered as span—this must be divided by rings and guy attachments at suitable heights. These transverse strengths will be calculated from the usual formula for hollow beams.

With structures of low altitude such high pressures of wind are not encountered, and do not need to be provided for, as is evidenced all around us. Take for instance a boundary wall 14 feet high and 18 inches thick. Let f= overturning force per square foot of surface in pounds. Taking 1 foot run of the wall, the overturning moment will be $f \times 14 \times \frac{14}{2} = 98f$. The centre of pressure of the wind will be half-way up the wall. Brickwork weighs about 112 lbs. per cubic foot, and the wall is 1·5 feet wide; hence the weight of a strip will be $112 \times 14 \times 1{\cdot}5 = 2352$ lbs., and the overturning moment $2352 \times 0{\cdot}75 = 1764$ foot lbs. Equating this with the overturning moment, we have $98f = 1764$ and $f = 1764 \div 98 = 18$ lbs. per square foot; and yet such walls stand. For large structures in exposed places it is necessary to allow the large wind factor; but it is highly improbable that in towns, and at the elevation of ordinary buildings, that the wind-pressure ever reaches 30 lbs. per square foot. Factory chimneys are of course excluded from this estimate pressure.

The effect of wind-pressure upon roofs demands careful attention on the part of the architect or engineer engaged in designing large covered works, and this we will now consider. The force with which we are now dealing cannot properly be added to the load upon a roof because it does not act in the same way as a load which produces vertical pressures. The strains due to the loads should be first calculated, and those due to wind afterwards added to them.

Whether the roof is formed upon rafters meeting in the ordinary way, or is carried by curved principals, it is obvious that the wind cannot be blowing on both sides at once, and it cannot therefore be classed with a load which is uniformly distributed; the principals will become unequally loaded, and in the case of the curved roof some distortion is produced. The normal pressure upon the roof covering will very materially depend upon the angle at which the wind strikes it, and this will always be greater if the wind is blowing across the roof than if its direction is longitudinal, because of the lateral pitch of the roof surface. The direction of the wind in a vertical plane will not necessarily be horizontal; it may to some extent blow downwards upon it. In general cases we may assume that the wind will not take a direction inclined more than twenty degrees to the horizon. For works erected in special localities this particular must be ascertained on the spot. Our example is an ordinary case, such as commonly occurs in towns. It is

no use, and contrary to economy, to make margins of strength in every direction, especially when, as is usually the case, an ample factor of safety is adopted in designing the work.

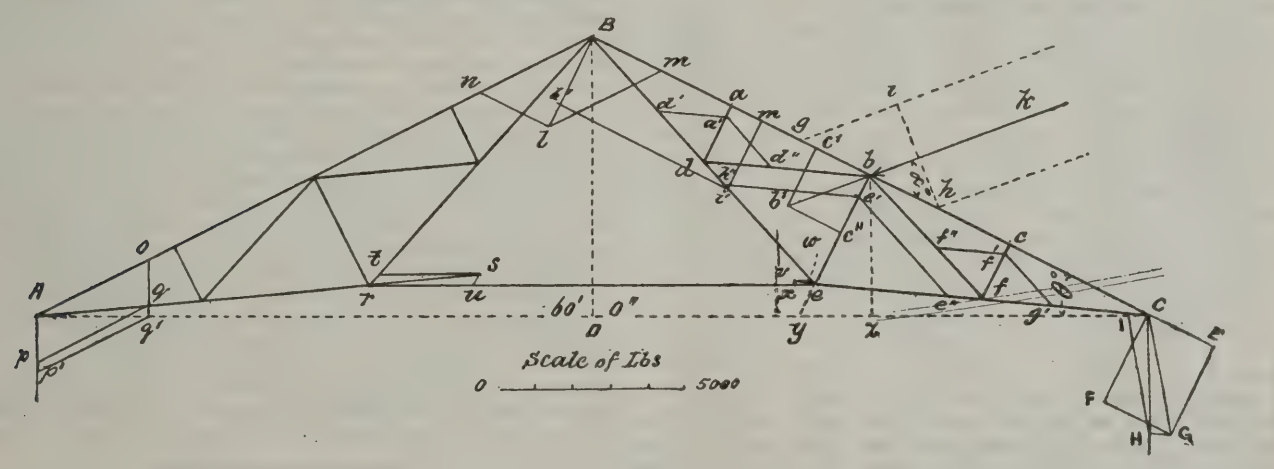
In figure 1 is shown a diagram of an iron roof of ordinary type, consisting of two trusses, *ABr* and *BCe*, connected by joint-plates at the apex *B*, and by a horizontal tie *re* at the points *r*, *e*. We will consider the wind pressure as acting on the side *BC*. The roof is assumed to be 60 feet span, with a 15 feet rise at the centre. The line *BD*, divided by *DC*, is the tangent of the angle *BCD* of the rafter *BC*, and is $15 \div 30 = 0{\cdot}5$, which we find, from a book of trigonometrical tables, is the tangent of an angle of 26° 34′. The length *BC* will obviously be equal to the secant of this angle multiplied by *DC*. Secant 26° 34′ = 1·118, and $BC = 1{\cdot}118 \times 30 = 33{\cdot}54$ feet. As *BDC* is a right-angled triangle, the length *BC* may also be found by taking the square root of the sum of the squares of the base and perpendicular thus :—

$$BC = \sqrt{(BD)^2 + (DC)^2} = \sqrt{225 + 900} = 33{\cdot}55 \text{ feet.}$$

The difference, which is due to not carrying the decimals further in the first calculation, is inappreciable practically. The length of the rafter is divided into four equal parts by the struts *ad*, *be*, *cf*, and each of these struts carries half a division on each side ; that brings upon it one-quarter of the total pressure on the rafter. The strip of roof carried by each strut will be, in width, $3354 \div 4 = 8{\cdot}385$ feet. Let the principals be placed 10 feet apart from centre to centre, then the roof surface carried by each strut will be $8{\cdot}385 \times 10 = 83{\cdot}85$ square feet. Next is to be ascertained the normal pressure put upon the roof by a current of air with a force of, say, 30 lbs. per square foot blowing down upon it in the direction shown by the line *kb*. Now the wind-pressure as given is measured on a surface square to the direction of the current, such as is shown by the dotted line *hi* ; but on the roof this pressure is spread along the space *hg*, and therefore the pressure per square foot on *hg* would be, calling *P* = the wind pressure per square foot, $P = \frac{hi}{hg}$; but $\frac{hi}{hg}$ = line of angle *hgi*, and this angle is equal to the angle *kbh*, at which the wind strikes the roof, assuming the vertical plane of the direction of the wind to coincide with, or be parallel to, that of the main principal *ABC*. Let this angle *kbh* = *a*, then if *P′* equal the pressure in the direction *kb* on the roof, $P' = P \sin a$. Produce the line *kb* to *b′*, making *bb′* = *P′*. The force carrying the air along will be expended partly in pressure on the roof and partly in continuing its course in a direction parallel to the roof surface, that is, in the directions *be* and *ba*. Complete the parallelogram *bc″b′c′*, then *bc′* will represent the normal pressure on the roof surface, and if we represent this by *P″*, then $P'' = P' \times \frac{bc'}{bb'}$; but *b′c′* is parallel to *bc*, therefore the angle *bb′c″* = the angle *kbh* = *a* ; because the straight line *kb′* falls upon the parallel lines *b′c″* and *bc*. But $\frac{bc'}{bb'} = \sin bb'c'' = \sin a$, and therefore $P'' = P' \sin a = P \sin^2 a$. As this is the only part of this investigation in which we shall use trigonometrical expressions (except in checking a thrust which requires the values of sin *a*), it may be convenient in order to save the trouble of referring to a book of trigonometrical tables, which may not always be convenient, to give here the values of sin *a* and sin² *a* for ordinary pitches of roofs ; but first we must decide upon a maximum value for the angle which the direction *kb* of the wind makes with the horizon in a vertical plane, because the sum of this angle and the angle made by the rafter *BC* with the horizon is equal to the angle *a*. For the class of work with which we are dealing the wind angle is taken as twenty degrees. Let *θ* = the angle of the rafter with the horizon, then in the following table are given the angles made by the rafters with the horizon, and the secants of those angles whereby to calculate the rafter lengths, the values of sin *θ* for checking the thrusts above referred to, and the values of sin² *a* for determining the normal pressures upon the roof surface.

The first column A contains the ratios of span to rise of roof. We will now proceed to resolve the stresses on the roof bars by parallelograms of force. For this purpose a diagram should be drawn to a convenient scale, such as a quarter of an inch to a foot, to allow the stresses to be measured up with accuracy. It is of no advantage though

A	θ	Sec. θ	Sin. θ	a	Sin.² a
4	26° 34′	1·1180	0·4472	46° 34′	0·5274
4½	23 45	1·0925	0·4027	43 45	0·4782
5	21 48	1·0770	0·3714	41 48	0·4442
5½	19 59	1·0640	0·3417	39 59	0·4128
6	18 26	1·0540	0·3162	38 26	0·3863
7	15 57	1·0400	0·2748	35 57	0·3341
8	14 3	1·0306	0·2427	34 3	0·3136



to make the parallelograms excessively large, as in that case the instruments used in drawing them are not so well under control. For this purpose it is preferable to use two set-squares, one riding upon the edge of the other, as parallel rulers are not always to be relied upon. From the foregoing formulæ and the table it is found that the normal pressure at each of the points *a*, *b* and *c* on the rafter *BC* is $= P \times \sin^2 a \times 83{\cdot}85$ square feet $= 30 \times 0{\cdot}527 \times 83{\cdot}85 = 1325{\cdot}67$ lbs. We will first deal with the local stresses on the truss *BCe*, due to wind-pressure. On *da* and *fc* mark off to scale *da′* and *ff′*, each equal to the load 1327·67 lbs. Complete the parallelograms *dd′a′d″* and *ff″f′g′*, then *dd′* = *dd″* = *ff″* = *fg′* = 1807 lbs. by scale. This will be the stress put upon the bars *bd*, *bf*. There will also be a like stress on the bars *dB* and *fC*. Half the load at *a* and half that at *c* are carried by the ties *bd* and *bf* to the point *b*, so the strut *be* has with its direct load a stress of 2651·31 lbs.; make *ee′* equal to this and complete the parallelogram *eh″e′e″*, then *eh″* = *ee″* = 3615 lbs., which is the stress on the bars *ed*, *ef*. These stresses pass to the point *B* and *C*, therefore the stresses on *Db* and *fC* will become 1807 + 3615 = 5422 lbs. From *B* along *Be* mark off *Bi″* equal to this stress and complete the parallelogram *Bh′i″m′* ; *Bm′* represents the thrust on the rafter *BC*; it scales 5048 lbs. This is equilibrated by a similar thrust from *C* towards *B*, and the local stresses in truss *BCe* balance each other. The stress *Bi″* is at *B* resolved into a stress *Bm′* and a force *Bh′* acting in a direction normal to the rafter. At *B* there also acts in the same direction the wind-pressure on half the width *Ba*.

This is equal to 662·83 lbs., and is to be added to *Bh'* by producing it to *l*. The force *l* is resolved upon the two rafters *BA*, *BC* by the parallelogram *Bnlm*; *Bn* is the thrust on *BA* and *Bm* the thrust on *BC*. From *A* mark off *Ao=Bn* and draw the parallelogram *Apqo* with the sides *Ap* and *qo* vertical. The thrust *Ao* is then resolved into a vertical pressure *Ap* upon the support at *A* and a tensile stress *Aq* on the tie *ar*. Produce *Ar* to *s*, making *rs* equal to *Aq*, and complete the parallelogram *rtsu*, then *ru* represents a tension of 2750 lbs. upon the tie-bar *re*, which joins the lower parts of the trusses *ABr* and *ACe*. We will next deal with the thrust *Bm* on the rafter *BC*. This is additional to the local stress *Bm'*. Produce *BC* to *E*, making *CE=Bm*. At the point *C* there will be a normal force equal to *Bl* which acts at *B* (ascertained in a manner similar to that used in determining *Bl*); draw *CF* to represent this and complete the parallelogram *GFCE*; *CG* will be the resultant of these two pressures, and it must be resolved between a vertical line of pressure on the support at *C* and the tie-bar *Ce*. Draw the parallelogram *CGHI*, making the line *CH* vertical, then *CI* will represent the tension on the bar *Ce*. Produce *Ce* to *v*, making *ev=CI* and complete the parallelogram *exvw*; *ex* shows a tension of 545 lbs. upon the tie *re*. The tensions on the horizontal tie do not balance, but leave an excess of 2750−545=2205 lbs. The stress on *re* will pass through the tie *Ce* to the bed-plate at *C*, and on the tie *Ce* the stress will become equal to *rs*=3000 lbs. There will also be an additional stress on bar *Be* equal to *tr*, which represents 375 lbs.

This unbalanced lateral force is due to the side pressure of the wind; how much of it will pass along the main ties *AreC* will depend upon the condition of the bearings. If *A* were absolutely fixed, the wind thrust *Ao* would be taken up by its horizontal resistance, but if it were free to move, the stress would pass to *C*. If the roof is carried on columns or walls, capable of yielding, it is probable that the displacing force will be divided between the bearings, but in what ratio it would be difficult to surmise. Under these circumstances it is necessary—to be absolutely safe—to allow for the whole stress to pass through the tie. As these computations have involved the use of consecutive parallelograms, it may be well to check the results by a trigonometrical calculation showing the lateral displacing force. We must first resolve the thrusts *Ao* and *CG* horizontally instead of along the ties *Ar* and *Ce*. To resolve the thrust *Ao* horizontally and vertically, complete the parallelogram *Aoq'p'*, the *Aq'*, then horizontal outward thrust, scales 2972 lbs. Similarly at *C* will be found by resolving *CG* horizontally and vertically an outward thrust of 591 lbs.; the difference of these, 2972−591=2381 lbs., is the resultant displacing force found by the parallelogram method. To check this produce *Be* to meet the horizontal dotted line *AC* in *y*, and draw *bz* at right angles to *AC*. Let *by* represent the whole normal wind-pressure on rafter *BC*, then *bzy* will represent half a parallelogram resolving this pressure vertically and horizontally. The horizontal force is shown by *yz*, and the vertical by *bz*. Let *M*=the horizontal force, *V*=the vertical force, and *L*=the total normal pressure=5302·62 lbs. The triangles *Cby* and *bzy* are similar, and the angle *ybz*=the angle *yCb=θ*. Therefore

$$M=yz=by\times\sin.\ \theta=L.\ \sin.\ \theta=5302{\cdot}62\times0{\cdot}4472=2371 \text{ lbs., and}$$

$$V=bz=by\times\cos.\ \theta=L.\ \cos.\ \theta=5302{\cdot}62\times0{\cdot}894=4761 \text{ lbs.}$$

The first is very close to the previously obtained figures 2381, being less than a half of one per cent. different, and if the vertical components of *Ao* and *Cg* are measured an equally close approximation will be found for the vertical force.

The tensile and compressive forces thus found on the various bars are to be added to those due to the vertical load, which are ascertained in the usual manner. The quantities to be added in our example are as follows:—

On rafter *BC*, stress *Bm'*=5048 lbs.; on tie *de*, stress *eh''+tr*=3615+375=3990 lbs.; on the *BD*, stress *eh''+dd'*=3615+1807=5422 lbs.; on tie *re*, stress *ru*=2750 lbs.; on tie *ef*, stress *rs+ee''*=3000+3615=6615 lbs.; on tie *fC*, stress *rs+ee''+fg'* = 3000 + 3615+1807=8422 lbs.; on each strut *ad* and *cf*, stress *da'*=1325·67 lbs.; and on strut *be*, stress *ee'*=2651·31 lbs.

Of course both trusses *Abr* and *BCe* must be made alike, as the wind may blow on either side of the roof.

In applying the principles explained above to crescent, girder or other forms of trussed curved roofs, it will be necessary to determine separately the normal pressure of wind at every point at which the stress is taken up by the structure, as on account of its convexity the angle at which the wind strikes it will be different in different parts. At each point it will be sufficiently accurate to take as the wind-pressure angle the angle at which it would strike a tangent to the roof at that point.

ST. MICHAEL'S, COVENTRY.

A MEETING of the general committee for the restoration of St. Michael's Church and spire was held this week at St. Mary's Hall, Coventry, the business being "Arrangements to be made for discharging the balance to the architect and contractor and outstanding liabilities on the restoration account." The Rev. J. R. Mills, D.D., vicar, was voted to the chair. Mr. A. Seymour, hon. secretary, gave an explanation of the finances of the undertaking, in which he said that not only had the late Mr. Woodcock promised to pay into the bank a further sum of 500*l.* during the week of his illness, which terminated fatally, but a cheque was actually drawn and signed, but not paid into the bank. Long negotiations had been carried on with the Charity Commissioners, with the result that they had consented to the mortgage of the church estate for 4,500*l.*, which was to be repaid by means of a sinking fund at the end of thirty years. The appeal to the donors to subscribe a further 5 per cent. upon the amount they had already subscribed had not produced as much as had been expected—only something under 100*l.* The total amount of income from subscriptions, &c., had been between 33,000*l.* and 34,000*l.*, and the total liabilities 38,963*l.* 7*s.* 2*d.*, against which payments had been made of 33,926*l.* 5*s.* 4*d.*, leaving a balance due of 5,937*l.* 1*s.* 10*d.* After reckoning up all the possible sources of income, there was an outstanding balance of 756*l.* Mr. Thompson, the contractor, had been written to, and had promised to assist the committee by making an abatement of 2½ per cent. if the balance of upwards of 5,000*l.* due to him were promptly paid; and it was decided to request Mr. J. Oldrid Scott, the architect, to also make some abatement from his charges, which totalled up to over 1,800*l.*, including travelling expenses. After a long and desultory discussion, during which it was stated that Mr. Woodcock's solicitors had intimated they should pay the 500*l.* which he had last promised, and that the Charity Commissioners would not consent to the completion of the mortgage until all the outstanding liabilities had been paid or guaranteed, Mr. W. Andrews proposed, and Mr. E. Mander seconded, a resolution approving of the action of the churchwardens, &c., in mortgaging the estate, and appointing a committee to take the necessary steps to raise the balance required. This was carried unanimously.

TESSERÆ.

Ancient Dials.

THE first sun-dial that was set up in Rome was erected by Papyrius Cursor, about the year of the city 447; for Pliny says there was no mention in any account of time, but of the sun's setting and rising. This dial was set up in the temple of Quirinus, but it went not right. About thirty years after this, M. Valerius Messala, says Varro, being consul, brought out of Sicily, from the taking of Catana, another dial, which he set up on a pillar near the rostrum; but it not being made for that particular latitude, it could not go true. Nevertheless they made use of it for eleven years, and then Marcius Philippus who was censor with Lucius Paulus, set up another that was more exact. The Greeks also were a long time without clocks and sun-dials. Some ascribe the invention of sun-dials to Anaximines Miletius and others to Thales. There are many kinds of dials mentioned by Vitruvius; as one invented by Berosus the Chaldean, which was on a reclining plain, parallel almost to the equinoctial; there was an half circle upon it, and thence it was called hemicyclus. Aristarchus Samius found out the hemisphere-dial. And there were some spherical ones with a needle for a gnomon. The discus of Aristarchus was an horizontal dial, with its limb raised up all round to prevent the shadow from extending itself too far.

Sir Godfrey Kneller.

According to Professor Ackermann, who has hunted up all the memorials still extant in Lubeck, the family name was Kniller. His father, Zacharias, was born on November 16, 1611, in Esleben, and was inspector of mines to Count

Mansfeld, who figured in the Thirty Years' War, but being compelled to seek a retreat in Lubeck during those troubled times, he turned his taste for drawings and mechanics to account, and in 1659 he became overseer of the works, and building curator of St. Catherine's Church and College, an ancient and extensive Gothic pile, used to this day as the gymnasium, library and picture-exhibition premises of Lubeck. According to the registers of this church, old Zacharias Kniller, who had, in October 1639, married Lucia Beuten, had four sons, Zacharias, John, Godfrey and Andrew, born in 1642, 1644, 1646 and 1649. Godfrey Kniller was, therefore, born on August 8, 1646, and not in 1649, as is usually stated. He was destined for the military profession, and sent to Leyden to pursue his studies in mathematics and drawing, but the muse had the upper hand in a generation when Holland swarmed with clever draughtsmen, brilliant colourists of land and water, and humorous observers of real life. It was in the school of Ferdinand Bol at Amsterdam that he went through his apprenticeship to this charming art, and the large, noble style of this master, as well as Kniller's admiration of, and personal acquaintance with Rembrandt, led him away from the minuteness of the Dutch cabinet school. On his return to Lubeck he painted the well-known picture of *Youth Instructing Age*, in the golden tone of Rembrandt, a charming work, but certainly without the magic power of the great prototype. It still hangs on the walls of St. Catherine's Library at Lubeck. After a visit to Italy, where Guido, Albano and Sasso Ferrato had brought the silver tone into full vogue, he settled in England. Then began that long series of portraits of azure-clad maids of honour, whose blonde ringlets floated amid trim Dutch gardens and close-clipped yews, and those naval and military heroes of the wars of William and Anne with curling battle-smoke and foam-crested waves in the background, and in the middle distance disporting Neptunes and Naïads, the appropriate and habitual population of the Nore and the British Channel. With a flowing tide of court favour, fame and gold, Kniller, now Sir Godfrey Kneller, glided pleasantly down the straits of life, equally remote from the Scylla and Charybdis of British party, on which many a bigger craft had been irretrievably wrecked.

Early Perspective.

Perspective, *perspectiva*, is an old name for optics. In this sense it was used, for the first time perhaps, by Roger Bacon, whose friend and pupil, John Peckham, Archbishop of Canterbury, did as much to spread the word as any one by his work on optics, "Perspectiva Communis," which lived till the invention of printing, and then went through many editions. In spite of doubts recently raised it may be assumed that Bacon's "John of London" is no other than Peckham, and that he is also the "Auctor Perspectivæ" to whom Bacon refers in the "Opus Tertium." If so, it is some proof of the notoriety which this work had attained that Bacon distinguishes Peckham by reference to the optics, when really quoting one of his logical works, of which it is otherwise known there were several. Peckham, or Peccamus, is of that notoriety under which a name is transfigured. Baldi, while calling him Betsan, laughs at the ignorance of those who call him Pisano; and Schott calls him Pethsan. All the authors on *perspectiva*, optics, are set down in one place and another as writers on what we now mean by the word: Bacon, Peckham, Alhazen, Vitello, &c. Some historical epitomists have even given critical accounts of the draughtsmanship of these optical writers, praising or blaming their manner of performing processes on which they never cast a thought nor wrote a line. The earliest work on perspective in catalogues is the "De Sculpturâ" of Pomponius Gauricus, Florence, 1504, in which *perspectiva* is a title-page promise. And this means optics if anything; and the optics is about the eye, which, we are informed, may be large, small, middling, prominent, &c.; after which we are introduced to the nose. Those who made catalogues did not look into books; those who looked into books did not correctly say what books they used: and these two negatives do not make an affirmative, unless positive falsehood or absolute confusion have a right to the name. The old sense lived in our language until after the Revolution. The small pocket Galilean telescope, which we now call an opera-glass, was the perspective glass, the pocket perspective, of Swift and Defoe, through which Gulliver watched the Blefuscuans and Robinson Crusoe the cannibals. And the word here does not mean a thing to spy through, but is a synonym of optic; the "optic-glass" would have done as well, and was, in fact, a tolerably common technical name. So that the readers of Milton should be aware that though "Tuscan artist" is undoubtedly poetry for Galileo, "optic-glass" is merely prose for a telescope.

Water Pipes of Alder.

Formerly the large alder was much esteemed for such parts of works as lie continually under water, where it sometimes became as hard as stone, but if suffered to lie exposed to the weather and at other times under the ground in watery places, it decayed in a short time. Vitruvius informs us that the morasses about Ravenna, in Italy, were piled with alder timber, in order to build upon, for which use he highly commends it. The Rialto, at Venice, is said to have been built upon piles of this wood. Trunks of trees or poles of alder were at one time much used in England for water-pipes for the conveyance of water through bogs and dams, and also for water-pipes for conveying water to supply houses from any spring. Large poles of trees of this wood were also used for ground-cuts. The poles were about 8 or 10 inches diameter, and the cavity in them about 4 or 4½ inches. But for water-pipes, poles above 4 or 5 inches diameter were sufficient, with the cavity about 1¼ inch or 1½ inch diameter. The method of boring alder pipes was as follows. The poles being laid on tressels of a proper height to rest the auger upon while boring, the men set up a lathe to turn the least end of the poles to fit them to the cavities of the great end of the others. The lathe being set up and the poles cut to the lengths they would conveniently hold, 8, 10 or 12 feet, they turned the small ends of the poles (about 5 or 6 inches in length) to the size they intended to bore the larger ends (about the same depths, viz. 5 or 6 inches). It was generally intended to make a joint to shut each pair of poles together; the concave part being the female part, and the other part the male of the joint. In turning of the male part they turned a channel in it, or a small groove at a certain distance from the end; and in the female part they bored a small hole to fit over this channel. This being done, they bored the holes through, and, to prevent them from boring out at the sides, they stuck great nails at each end, to be a guide to them in boring straight through, though they usually bored them at both ends, by which means, if a pole were crooked one way they could bore it through and not spoil it. The holes being bored, they formed them into pipes in the ground, for which purpose they dug a trench, and prepared it with clay to ram in the concave part, which was first bound with an iron ring round it to prevent it splitting. Afterwards they drove in the convex part till the groove in it was just under the hole, and poured melted pitch, hot, into the hole in the female part. By this means the junctures were rendered very compact and close, and they proceeded until they laid all their poles or pipes in their order.

Wood of Bath.

John Wood, commonly spoken of as "Wood of Bath," was an architect of considerable repute and merit in the time of George II., in ability and taste little, if at all, inferior to any of his contemporaries, although he has obtained less notice from architectural and biographical writers than some of them have done. In fact, very little can now be collected relative to him, beyond what he himself has incidentally told us in his "Description of Bath." That city is indebted to him for its architectural fame; and he may be considered as having there introduced a style of street architecture till then quite unknown in this country, by combining a number of private houses into one general design; and, although such mode of producing continuous façades was afterwards adopted by the Adams, was followed by Nash, and has since become very general, Wood still continues to be nearly the first in point of merit as he is of date. It was about the end of 1726 that he began his Bath "improvements," which he carried on uninterruptedly for about twenty years, within which time he entirely changed the architectural character of the place, and conferred upon it even a degree of magnificence, at least as displayed in such parts as the Parades, the Circus, the Royal Crescent, Queen's Square and some of the public edifices, and even some of these would have been superior to what they are had they been executed entirely according to the original designs. If not altogether proof against criticism, they are at any rate free from the sneering reproach levelled against many later works of the kind, as being mere "lath and plaster;" and if Smollett has spoken of them very deprecatingly, in his novel of "Humphrey Clinker," others have been even prodigal of praise. Among these last is the author of the "Principles of Design in Architecture," who says:—"With all its faults in parts, I must reckon the Crescent, at Bath, among the finest modern buildings (1809) at this day existing in the world." And he further laments the decay of architectural taste in Bath since Wood's time. What he did, therefore, at Bath alone, would justly entitle Wood to an eminent place in the history of English architecture; and, not least of all, for the very reason which has perhaps occasioned him to be passed over with mere general notice, inasmuch as he distinguished himself rather as the founder of a system of improvement than as the author of any individual structures of importance. Still, he produced some works of the latter class which would have preserved his name from oblivion, and among them are the noble mansion of Prior Park, erected for the "Generous Allen;" that of Buckland, for Sir John Throckmorton, and the Exchange at Bristol, first opened in September 1743. This last is, if not a very large, a very handsome structure. Wood, who at that time was a justice of the peace for Somersetshire, died May 23, 1754.

NOTES AND COMMENTS.

THERE is a class of men around London who may be called earth-robbers, for they live by carrying off the surface of building sites without authority. Sometimes one of them enters into negotiations for a lease of a piece of ground that consists of good gravel and contrives to get possession; he loses no time in commencing operations, but with all the excavations there are no signs of the brickwork. There is a sudden suspension of operations, and when after more or less delay the owner gazes over the paling which is so carefully put up around the site, he discovers that his property has become a vast chasm which it will be expensive to fill up. A case that was tried in the Court of Appeal on Tuesday shows the complications to which such robberies can give rise. In August 1889 a man agreed to purchase five plots of building land at Southend, and the conveyance was signed in the following October. When he took possession he discovered that immediately after his offer was accepted about four hundred cartloads of soil had been removed. He brought an action against the owner (to whom also the removal was a surprise) for negligence in not keeping the grounds in their original state, and a jury awarded him 75*l*. The owner applied for a new trial on Tuesday, but was not successful. The damages were, however, reduced to 50*l*. The Court held that on the signature of the contract for sale the defendant became a trustee for the plaintiff of the property, and he ought not to have allowed the soil to be removed without the plaintiff's consent. "It had been argued," said Lord COLERIDGE, "that under the circumstances no care was necessary on the part of the defendant, but he was undoubtedly bound to take reasonable care to preserve the property in the state in which it was, and to take no care was not reasonable." It was further argued that even if the plaintiff had a remedy against the defendant in respect of the deterioration of the property, he waived his right to any such remedy when he executed the conveyance. That, no doubt, would be so in some cases, but when, as in the present case, neither party knew what had happened to the property, or was aware of the deterioration, it was impossible to say that the execution of the conveyance was a waiver of the plaintiff's rights. The decision of the Court in the case was fair and reasonable, but is nothing to be done to punish those who carried off the soil and thus set two honest men at loggerheads?

THE Luxembourg Gallery in Paris is now as well arranged as it is possible for a place to be which is subject to periodical transformations. Every visitor will be glad to welcome the beautiful examples of medals, plaques and enamels which have been introduced in the sculpture gallery. It would, however, be more satisfactory if all those objects, which are on a small scale, were separated from the large works in bronze and marble, which seem to oppress the tiny new-comers. The most startling innovation among the pictures is the appearance of EDOUARD MANET'S representation of some brazen VENUS of the Batignolles. This work, when it was first sent to the Salon in the days of the Empire, was rejected; but it appeared in an exhibition of rejected works, and then, like the clarion of HERNANI, it appealed to all the young revolutionaries in art and literature. M. ZOLA saw in it a revelation of that realism which he was afterwards to expound. There were writers also who were unable to discover one trace of skilful draughtsmanship or faithful colour. As a work of art it would be out of place among a collection of the worst pictures of the gallery. It seems to be little more than a sketch of a figure which is covered with the first coat of paint, and which subsequently might be made to resemble flesh. The picture was forced into the Luxembourg, in spite of rules and regulations, by the steadfastness of MANET'S friends. They were eager to see a production which, if valueless as a work of art, was still notorious as the representative of the war against grace and beauty, set up prominently at the public expense, and they have succeeded. High officials in France are squeezable, and will sacrifice much to avoid collisions with any sort of force. MANET'S friends knew this, and hence the picture which originally captivated ignorance now becomes a manifestation of the weakness of French Governments.

IN spite of all its defects, or it may be in virtue of them, this year's Salon has been financially successful. It appears that the money received for admission has amounted to 315,000 francs, or 77,000 francs in excess of the sum paid in 1890. In 1889 the receipts were only 189,000, owing to the rivalry of the International Exhibition. From the returns, it would appear that little was lost through the second exhibition in the Champ de Mars. Everyone who visited the more remote show was sure to have seen the Salon, but it does not follow that all those who paid a franc in the Champs Elysées felt they were under an obligation to patronise the new show. An *entrepreneur* looking at the vacant spaces in all the galleries of the building on the Champ de Mars could hardly refrain from concluding that, as a speculation, there must be losses attending the venture of the reformers.

THE use of wells as a source of water supply is becoming so general in many parts of the country as to give importance to the decisions in the action brought by the Tendring Hundred Waterworks Company against Messrs. TREE, RODWELL & Co., brewers. In 1886 the company, that was formed to supply 4,000 inhabitants in Essex with water, purchased a piece of ground from the defendants in which to sink a well that was to yield 48,000 gallons daily. It was stipulated that the defendants were not to sink any well between the railway and the road. But recently a well was sunk beneath the road and the river, and it was anticipated that in consequence the water company's supply would be diminished, besides being affected by the incoming of salt or brackish water. An application was accordingly made for an injunction to restrain the brewers from doing anything that would lessen the water company's supply or be prejudicial to its purity. But a judge cannot be expected to yield to panic, and Mr. JUSTICE HENN COLLINS refused the injunction. An application was accordingly made before Mr. JUSTICE DENMAN and Mr. JUSTICE WILLS, but without bringing any change in the circumstances of the case. Their lordships held there was nothing in the deed to prevent the defendants from sinking a well on their own land. There was only a stipulation not to do so within a certain limited area, which left them free as to the rest. Nor was there any legal ground on which they were precluded from endeavouring to obtain a supply of water on their own land. The mere apprehension that the effect might possibly, by letting in brackish water, injure the plaintiffs' supply of pure water, was not sufficient to preclude them. The defendants had as great an interest as the plaintiffs in the purity of the supply. It was not necessary to show an utter impossibility of any injury; it was enough that it appeared improbable, and it was not a case for an injunction. The directors of water companies, if they anticipate that wells may be sunk in the vicinity of their property, will have to take more general precautions than were adopted in the Tendring case. It should also be remembered that when a supply is underground all the operations are invisible, and it is no easy matter to convince judges that the conditions of affecting causes correspond with those which are visible in supplies drawn from rivers, streams and gathering grounds.

THE ruins of the Cour des Comptes on the Quai d'Orsay, in Paris, have so long amazed natives and foreigners, it is only natural to assume that they are destined to go on decaying until in some remote period when there will be an energetic Government that will make short work of them. It appears, however, that a new treaty has been entered into which concerns the ruins. The Ministers, it is said, have agreed to hand over the remains of the buildings to the Union Centrale des Arts Décoratifs. The conditions are that the Union will expend a sum estimated at 3,170,000 francs in converting the ruins into a museum, which, with all the collections, will become national property at the end of fifteen years. The site is not adapted for a museum of industrial art, as the men who will make use of the collections are to be found on the opposite side of the city. But we suppose something must be sacrificed to get rid of an eyesore. If the ruins can be converted into useful buildings much will be gained; but as similar arrangements have been entered into from time to time during the past dozen years, the Parisians are likely to be sceptical until they see the new museum opened.



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WM. BRAKEN, Architect.



The Architect, July 10th 1891.

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The late J. MACLAREN, Architect.



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[THE LATE J. MACLAREN.]

NEW WELSH PRESBYTERIAN CHURCH, RUTHIN.

THE new Welsh Presbyterian Church and schoolroom just completed occupies a commanding site in Well Street, Ruthin, and was formally opened on April 24. The buildings are constructed of limestone, with Denbigh stone dressings. The front portion of the church is circular on plan, having a radii of 27 feet, and measuring internally 55 feet by 54 feet. Accommodation is provided for 550 persons. The sittings are arranged in a circular-gallery form, with stepped aisles leading to the body sittings. The schoolroom is 41 feet 6 inches by 24 feet, and is at the rear of the church, having minister's vestry, lavatory and conveniences adjoining. A large room, 54 feet by 24 feet, forms an upper schoolroom over. The church is lighted by the "Stott-Thorp" patent coronas; heated by Messrs. MINSHULL & Co., of Oswestry. The architect is Mr. T. G. WILLIAMS, 3 Cable Street, Liverpool.

BREWERY TAP FOR CITY OF LONDON BREWERY COMPANY.

ARTIST'S FEES.

A CASE was lately tried in the Scotch Courts before Lord Stormonth Darling. It was an action by William Small Black, artist, Edinburgh, against John Watson, of Earnock House, near Hamilton, Lanarkshire, for payment of balance of 715*l.*, said to be due in respect of his designing and executing for the defender a large allegorical oil-painting and three small ones for the ceiling of his drawing-room at Earnock House, and decorating the wall-panels and generally superintending the colouring of the room. The defence was that the limit of the cost for the work was 450*l.*, and, to save further litigation, 220*l.* was tendered, which, added to 230*l.* paid to account, made 450*l.*

Mr. Black was the first witness. He said he was an artist and designer, and that in consequence of a letter he received in May 1890 from Mr. Grieve, of the Waterloo Hotel, he went down to Earnock to see Mr. Watson about the decoration of the drawing-room. Mr. Watson impressed on him that he wanted a very fine piece of work, and, after consultation, asked him what the work would cost. Witness said that work of this kind was now very rare in Scotland, and the price could not be fixed. He went down to Earnock and began his work about June 12, and stayed there until September 12, devoting himself entirely to this work. Sometimes he worked nine hours a day, sometimes ten, and sometimes eleven hours a day. The oil-painting on the ceiling was worked upon French ceiling canvas. The sketch design occupied him several days in preparation, and the human figures were drawn and painted from living models which he brought from Edinburgh. He left Earnock on September 12, and was not allowed to go back again till November 19, after which, on account of the weather, the work was carried on under very disadvantageous circumstances. The work was finished on February 2, 1891, and after that he rendered an account to the defender's agents amounting to 945*l.*, of which 205*l.* was outlay and expenses. Mr. Watson, at an interview on September 6, said:—"I will give you a fair price, a good price, but not a fancy price." Witness replied that that was all he wanted.

Cross-examined, Mr. Black said that no parts, either in the ceiling or in the panels, were copied. He followed the style of Louis XVI., but the design was original. It was false to say that at the interview of September 6 witness said to Mr. Watson that the cost would be more than he had thought. What he said was that, so far as he could see, it would not be a penny less than 500*l.* or thereby. The only thing fixed at the interview was that the price should be a fair price, a good price, but not a fancy price. The sum now claimed was not a fancy price.

Professor Baldwin Brown said that on June 5 last he, along with several other artists, visited Earnock House in order to examine the paintings and decorations in the drawing-room. He examined them thoroughly, and, as a whole, the work produced an extremely good impression upon him. He thought it was thoroughly artistic and carried out in a very workmanlike way. The design seemed to be suitable and in accordance with the traditions of that kind of work. It would hold its place very well with similar modern work. Witness would call it artist's work, as distinguished from the work of a mere journeyman painter. Work of this kind was very rare in Scotland, and, in the opinion of witness, was a credit to the Scottish school.

Cross-examined: The work, strictly speaking, was Louis XV. There were, as witness knew, a great number of decorators in Paris who did decorative work, but he thought that this ceiling painting was above that class of work. The scale of the centre-piece seemed perfectly suitable. *Q.* What do you think of the aerial perspective? *A.* The general effect one looks for is there. *Q.* Was it not rather crude? *A.* No, it was crisp without being crude.

Mr. J. Lawton Wingate, R.S.A., said that he had visited Earnock House. He was very much delighted with the work and with the fact that it should have been executed by an Edinburgh painter. Mr. Black's account of 900 guineas was, witness thought, a fair and reasonable price, not very much in Mr. Black's favour. Mr. Watson had got a beautiful room for a very moderate price.

Mr. Robert Macgregor, R.S.A., who had also visited Earnock House on June 5, said that Mr. Black's work struck him as being very fine in colour and composition.

Mr. Robert Alexander, R.S.A., characterised the work, the colouring and the design as good.

Mr. Robert Purvis Bell corroborated.

Mr. Thomas Bonar, painter and decorator, Edinburgh, said that he had made decoration his special study. He visited Earnock House on June 5 and saw Mr. Black's work, which he thought most artistic and successful. With few exceptions, it was the best specimen of the work he had seen in Scotland. The work, to his mind, was surprisingly quickly done. He formed a proximate idea of what the price would be, and thought that 1,000*l.* was a moderate figure. Cross-examined: The work done at Earnock was so unusual that he would not estimate for it. The flowers might stand for pictures, and in this sense were superior to the work usually done by foreign decorators. Mr. Bonar said that he had frequently refused to undertake such work because he did not know where to get a man qualified to carry the designs into execution. This case had brought the matter to the front, and he was glad to know that men were now to be had for the work, of whom the pursuer was at the head.

Mr. W. S. Cumming, artist, Edinburgh, gave it as his opinion that 900 guineas was a moderate price for the work done by the pursuer at Earnock House.

Mr. John Grieve, of the Waterloo Hotel, deposed that at the meeting between the parties no estimate of the price was given.

Mr. Watson in his evidence stated that it was on the suggestion of Mr. Grieve, of the Waterloo Hotel, that he decided to get his drawing-room decorated. Mr. Grieve mentioned the name of Mr. Black, and in an interview with Mr. Black, Mr. Black informed him that it would cost about 300*l.* He thought that a large sum, and told him so; but agreed that Mr. Black should go on with the job. Had he known it would cost much more he would never have sanctioned it. After the work had been partly executed, Mr. Black wished a payment to account. He said he was doing more work than he expected, and must have 500*l.* for the job. He expressed his willingness to go the length of 350*l.*, but Mr. Black said he would strike 50*l.* off the 500*l.* He gave him a payment to account of 150*l.*, and on leaving for the Continent in September left instructions with his local agent to square up with Mr. Black on the lines of witness's understanding of the contract. In February he received the pursuer's account for 900 guineas.

Thomas Ciceri, fine art dealer, Edinburgh, said that he had large experience in artistic work. He had carefully examined the work of Mr. Black in the drawing-room at Earnock, and his estimate of the cost was 383*l.*, the value of the panels varying from 35*l.* to 7*l.*

Cross-examined, he said he would not yield to Robert Macgregor, James Lawton Wingate or Robert Alexander as a judge of this class of work. Their work was entirely different, and they had no experience of that done by Mr. Black.

Other witnesses were examined to show that the price was excessive.

Lord Stormonth Darling, in giving judgment on Saturday, stated that between the middle of June 1890 and the beginning of February 1891 the pursuer, on the employment of the defender, decorated the ceiling and walls of a large drawing-room at Earnock House, and he now claimed a fee of 900 guineas for the work. The defence was twofold—(1) that the pursuer agreed to do the work for 450*l.*; and (2) that the sum claimed was excessive. The defence of agreement had not, in his lordship's opinion, been made out. Admittedly, there was no agreement to begin with, and the conversation which took place in September, when a payment to account was made, did not come to more than this, that the plaintiff named 500*l.* as

the probable cost, and said something not very definite about making a deduction of 50*l.* But the defendant did not agree to this, and the conversation ended without any terms being arranged. His lordship was therefore left to fix a *quantum meruit* for work of a kind which was rare, for which, therefore, it was very difficult to find a standard, and about the value of which opinions differed very widely. In fixing a sum his lordship was simply exercising the functions of a jury, and he was not required to state his reasons for coming to the conclusion that a sum of 600 guineas was reasonable remuneration for the work. But it might be convenient that he should indicate the leading considerations which had led him to that result. It was clear, he thought, that the defendant started with too low an idea of the probable cost. He had formed the impression (on no data of any kind and without skilled advice) that it ought not to exceed 300*l.* But none of his witnesses put it so low as that, and some of them estimated the value of the work at very nearly 500*l.* The plaintiff's witnesses to value, on the other hand, said that the sum claimed was in their opinion reasonable—some of them even said that it might fairly have been higher, but none of them, except Mr. Bonar and Mr. Walter Crane, gave any data for their opinion. If his lordship had merely to choose between these conflicting statements, he should probably have looked for the truth somewhere between the extremes on either side. But it seemed to him that a safer guide was to be found in the indication—rough, no doubt, and not obligatory, but still most important—which the plaintiff himself gave in the conversation to which his lordship had alluded, in the month of September, when the greater part of the work had been done. He knew then the nature of the work, and the probable time it required to complete it. After giving such an indication, his lordship did not think he was entitled to go so far as nearly to double the amount. On the other hand, his lordship could not throw out of view that he was fairly entitled to expect that he would be allowed to resume his work after the immediate cause of its cessation (a marriage in the defendant's family) had gone by. If that had been done, he could have finished before the winter. As it was, he was prevented by the defendant from getting access again to the room till the middle of November, by which time the state of the light made the work much longer and more difficult. For that reason he thought he was entitled to a substantial addition to the sum which he had indicated in the early part of September. His lordship held it proved, notwithstanding the adverse criticisms of some of the defendant's witnesses, that the plaintiff's work was of a high order of excellence, and that, viewing it simply on its merits, the sum which he had fixed was by no means an excessive price. Had the plaintiff been a man of more established reputation in this branch of art it was probable that he might fairly have been entitled to claim a higher price for it. But he was a young man who never did so important a piece of work before, and, at all events, as his lordship had said, he ought not even to have indicated a sum of 500*l.* when three-fourths of the work was done, if he meant at the end to make a claim of 945*l.* His lordship found that the plaintiff executed the work in question on the employment of the defendant without any agreement being made as to price, and that he was entitled to payment of the fair value of the work done, and found, further, that the sum of 630*l.* was the fair value of the work, and that 230*l.* had been paid to account. He ordained the defendant to make payment of 400*l.*, with interest, and found the plaintiff entitled to expenses subject to a large modification.

Counsel for the plaintiff—Mr. M'Kechnie and Mr. Kennedy. Agent—J. D. Macaulay, S.S.C.

Counsel for the defendant—Mr. Jameson and Mr. Dewar. Agents—Simpson & Marwick, W.S.

THE BRITISH SCHOOL AT ATHENS.

ON Friday Lord Justice Bowen presided at the annual meeting, held in Albemarle Street, in support of the British School at Athens.

The Hon. Secretary read the annual report, which, after referring to the excavation of the theatre at Megalopolis, gave the names of the students admitted or readmitted in the school in the course of the session, and stated that Miss Eugenie Sellers, who was well known in London as a lecturer on archæology, had been admitted as the first lady student. Messrs. Schultz and Barnsley, who had returned to England in December, had continued during the past session their valuable work on Byzantine architecture. They might possibly return to Greece in the autumn. The report concluded by referring to the finances of the school, and recommending a large increase in the number of annual subscribers, as there was no adequate endowment.

The Chairman, in moving the adoption of the report, said:—Ladies and Gentlemen,—We may venture, I think, this afternoon to indulge in the belief that the fortunes of the British School at Athens are steadily, although slowly, progressing. I recollect that when, some few years ago, that distinguished representative of English scholarship, Professor Jebb, first brought before the world the plan of such an institution he indicated two sources from which its friends might reasonably expect support. One was the kindness of our Universities. It cannot be unnatural to hope that they will extend confidence and sympathy to this work. The colleges of the United States have done much for their American institution, and the Universities of Great Britain and Ireland will, I am sure, sooner or later feel themselves directly concerned in the welfare of the English Athenian School. Till a somewhat late period it was on the side of archæology and local investigation that Greek scholarship amongst us was weakest. And it seems to be generally conceded that the teaching of our Universities and public schools still requires much strengthening in this direction. To the educational bodies of the future it will seem an essential qualification for a Greek professor or lecturer that he should have studied the language, literature, history and art of Greece by the light of modern archæology. The best context by which to read a national literature is that furnished by the skies under which it flourishes and the soil from which it sprang. To the absence of accurate acquaintance with this natural context may be attributed something of the narrowness of the grooves in which Greek scholarship amongst us seemed fated, some little time ago, to run. But the borders of English scholarship have been broadening. The Hellenic Society and the British School at Athens are two welcome products of the new movement. And the spade is revolutionising the Classical curriculum as completely as thirty or forty years ago, under Todleben, it revolutionised the science of war. Out of the funds of our English Universities one can readily understand that it is difficult to ask for much aid. But though the hands of the University authorities at Oxford and Cambridge are somewhat tied, the individual colleges and their governing bodies have ample power of encouraging and assisting the British School at Athens. Among the academical events of the last year there is one which deserves special mention this afternoon, as affording an instalment of generous sympathy from the side of one of our Universities which we may hail as an auspicious omen. In order to enable Mr. Ernest Gardner to continue his services to the cause of archæology and of classical study as director of the Athens School in the chair first filled by Mr. Penrose, Caius College has re-elected Mr. Gardner to a Fellowship for a renewed term of three years. Is it too much to trust that other colleges at Oxford and at Cambridge will come to the rescue also by treating work done or to be done at Athens for the British School as worthy of special encouragement and privileges? Among those present to-day there must be several who have the means of securing that this point of view shall be seriously considered and weighed by the common rooms of Oxford and of Cambridge. But there is another source from which succour might reasonably be expected, namely, the generous sympathy and assistance of some of those lovers of learning and of art of whom in England there are so many. Possibly those who are always ready to further a good cause will accept the assurance of English scholars, such as some of those I see around me, that the British School at Athens is an object well deserving of their attention and their goodwill. France, Germany and America are even ahead of us in what they have done. Their schools at Athens started in front of yours and rest on a more solid pecuniary foundation; yet it is this year a pleasure to be able confidently to say that the English work at Athens has begun to make itself felt, and is likely to continue to do so. The completion of the excavations at Megalopolis, in particular, furnishes us with a matter for just congratulation. If fortune is propitious we may regard these explorations as the first of a series of happy enterprises over which your director will, I hope, be called upon to preside. To all whose personal tastes lead them in the direction of similar adventures the British School at Athens affords an invaluable basis of operations. To have the assistance, upon the spot, of the wisest advice, of the best local experience, and the best books is an advantage not to be despised. I hoped to see this afternoon Sir Charles Newton among us, with whom all such enterprises as ours are so intimately connected. I trust that his absence is not due to any failure in his restoration to health and strength. I am sure his name will never be forgotten by the friends of such an undertaking as this. I will not detain you by further observations, but will conclude what I have to say by at once moving the adoption of the report.

Lord Lingen seconded the adoption of the report, and observed that a new and living interest would be given to the old classical studies by more intimate acquaintance with the birthplaces of the noble literatures of Greece and Rome. He hoped that as a British School had been established at Athens, other schools would be set up at the great centres of antiquity in the way in which the French had established a school of painting at Rome. The report was unanimously adopted.

Mr. Ernest Gardner then read the report of his work during

the last year, and expressed his gratitude to Mr. Penrose for so kindly taking his place at Athens during his absence last year at Cambridge, and to his college for re-electing him to a Fellowship. He then gave an account of the lectures and the work of excavation which had been going on. They had been able to continue the work at the theatre at Megalopolis, and the decision of the committee to continue the excavations had produced very satisfactory results. After giving a detailed account of the work accomplished, Mr. Gardner expressed the belief that there still remained valuable discoveries to be made, and he was glad to say that any misunderstanding which might have existed between Dr. Dörpfeld and himself and colleagues had been removed, and that they were now all working together in harmony. As to the difference of opinion on matters of detail between Dr. Dörpfeld and the British School he would ask for a suspension of judgment until a later date.

Mr. Penrose then gave a short account of his work at Athens, which was mainly devoted to the site of Megalopolis.

Professor Lewis Campbell, in moving the election of officers of the school, said that he had visited Athens this spring, and was glad to bear testimony, not only to the good work done by the school to its own students, but also to the kindness which Mr. Gardner and the members of the school extended to all visitors who had any interest in classical studies. He had also realised the admirable work which was being done at Megalopolis. For himself, he could not dig, but for such a cause he should not be ashamed to beg.

Dr. Perry, in seconding the motion, expressed regret that this country should be so far behind Continental countries in the maintenance of such work as was now being carried on by the British School.

Professor Jebb moved a vote of thanks to Lord Justice Bowen, which was seconded by Sir George Bowen.

DUNDEE INSTITUTE OF ARCHITECTS.

THE annual meeting of the Dundee Institute of Architecture, Science and Art was held last week, Mr. Charles Ower, C.E., presiding.

Mr. Henderson, the secretary, submitted the annual report, showing that the membership last session consisted of 49 members, 152 associates, and 7 honorary members. This year's roll contained the names of 50 members, 168 associates, and 8 honorary members. The council put on record its sense of the Institute's loss caused by the removal by death of such men as Captain Adams and Mr. W. J. Small from the associate roll, and of Professor Carnelly and Mr. Patrick Allan Fraser, of Hospitalfield, from the roll of honorary members. Of Mr. Fraser's courtesy and kindness and devotion to art the Institute had had rich experience; and of Professor Carnelly's devotion to science, in its bearing upon the health condition of life, the Institute had received lasting proofs. The council had seen fit to enter upon some experimental work by way of providing a library and consultation-room and adding to the attraction of the conversazione. Extra prizes to competitors and additional advertising of the lectures accounted for the remainder of the increased expenditure. The rest of the report dealt with the lectures, excursions and competitions which had taken place. The treasurer, Mr. George A. Harris, submitted the accounts. They had commenced the year with a balance of 60*l.* 5*s.*, and the total income had amounted to 131*l.* 5*s.*, while the expenditure had reached 89*l.* 13*s.* 8*d.*, leaving a balance in hand of 41*l.* 11*s.* 4*d.* The sum of 14*l.* 3*s.* 6*d.* had been paid in prizes, as compared with 5*l.* last year. The report was unanimously approved.

The President drew attention to the proposal that the branch affiliate with the Royal Institute of British Architects, which was, as they were aware, the principal body in this country representing architects and architecture. It had instituted examinations, and by other means was endeavouring to raise the status of the architectural profession throughout the country, and part of their programme was to endeavour to affiliate or ally itself with societies whose rules were in such a state that they could be conformed to the charters of the Royal Institute. They had had a long correspondence with the secretary of the Royal Institute, and one of the first points he had noted was the form of application to membership and the form of declaration which had to be taken. The latter provided that the member signing it was engaged in the practice of architecture, and, in consideration of his being elected to membership, to promise and agree that he would not accept any trade or other discounts or illicit or surreptitious commissions or allowances in connection with any works the execution of which he might be engaged to superintend, or with any other professional business which might be entrusted to him. That, Mr. Ower said, looked on the face of it a most objectionable thing. It appeared to be a most objectionable thing to ask a body of honourable men to sign a declaration like that; but they found that the declaration had been signed by every architect of any eminence in this country, and while to an honourable man it made no difference, it acted as a check to those who were not so honourable. In connection with the election of Associates, the rules had been amended so that ladies should be admitted, and not be dependent on gentlemen for tickets to the meetings of the Institute.

Ex-Bailie M'Culloch asked if this question had been raised on the initiative of the Dundee Institute.

The President said his impression was that it arose from a suggestion made by the Royal Institute.

Bailie M'Culloch remarked that the Royal Institute had been the chief opponents of the Registration Bill. They had boasted in their opposition that they represented the architects of the country, and if they managed to get the assistance of such Institutes as that of Dundee, it would give them still greater standing. The Dundee Institute as a Society had petitioned in favour of the Registration Bill year after year, and to Bailie M'Culloch's mind it was a very desirable measure. Architects had taken great interest in the plumbers' registration, and it was really very absurd, after the interest they had evinced in that subject, to imagine that they were satisfying themselves by remaining an open body. Another point he should like to touch on was that in London surveyors were separated from architects, and were not included in the Institute. In Dundee they had no separate body, and therefore, before joining with the Institute, they should see that they did not hamper themselves in this respect.

Mr. J. J. Henderson said there was a difference between plumbers and architects. Plumbers went in for voluntary registration, but architects wanted Parliamentary registration. He further mentioned that if they were not satisfied with their alliance with the Royal Institute they could terminate their connection on three months' notice.

The Chairman moved that the proposal to affiliate with the Royal Institute of British Architects be approved.

Mr. W. Mackison seconded, and said he was satisfied that by affiliating they would receive much benefit. It might, among other things, be an outlet for young men getting situations in London.

The motion was carried.

ST. MARTIN'S CHURCH, COLCHESTER.

AT the monthly meeting of the Colchester Town Council the following report was presented by the Museum, Muniment and Library Committee:—

In accordance with the resolution of the Town Council, the committee have carefully considered the subject of the restoration of the parish church of St. Martin, Colchester. The committee have abstained from going fully into the legal aspects of the question, and how far the by-laws of the borough affect the liability of the church authorities to submit plans of proposed alterations to the Urban Sanitary Authority previous to their being carried out; and into the intricate ecclesiastical laws bearing on the general question of church buildings.

The church of St. Martin has always had much interest for Colchester people, irrespective of their religious views, from the historic associations connected with it, and the picturesque appearance which the building has until recently presented. The tower, built for the most part of Roman tiles, was a good deal injured by the cannon of the besiegers in 1648, and remains in about the same state as then. Some amount of regret was caused by the destruction of the ivy which had grown in beautiful masses on the tower, and this has made many persons very sensitive as to any fresh proposals for altering the building. The church is of the decorated period of Gothic architecture, with a very fine timber roof. The font is of Caen stone, elaborately carved, and interesting from there being embedded in it several bullets fired in the siege of Colchester.

The alterations proposed comprise the following:—General repairs to the walls and roof. To effect the former the mural tablets have been removed, but the rector (who has been communicated with by some members of the committee) has given an assurance that they will all be replaced on the walls of the nave or tower. The floor of the chancel is being raised to the extent of about 2 feet at the east end by means of steps, four in number, of the whole width of the chancel. The effect of this is to considerably alter the appearance of the interior from its original state. Although the seats of the sedilia have been raised, they are now very close to the floor, and could not be suitably used for their intended purpose if so required. The sill of a doorway on the north side is about a foot below the floor, owing to the latter being raised. There are to be built a choir vestry and organ chamber outside the church, and communicating there by two arches, one to the east end of the north aisle, the other by opening out an old arch into the chancel. By removing a portion of the wall a fine specimen of a fifteenth-century window will be taken out, and it is understood it will be inserted in the wall of the new vestry. The

ancient simplicity of this part of the church will by these changes be lost. As regards the tower, the rector has undertaken that no change will be made in it beyond making it safe, nor will the font be in any way interfered with; and, should the Council desire, permission will be given for a suitable tablet to be placed in the tower, mentioning the fact of the damage occasioned to the structure and font during the siege of Colchester, for the information of visitors. The rood staircase is to be opened out, a few other minor changes made, but the "squint" will not be altered.

The work is being carried out by the rector and churchwardens. There does not appear to be any town or parish committee, but funds have been raised by voluntary subscriptions and by a bazaar, to which the inhabitants of Colchester liberally contributed. The proceedings have the sanction of the bishop of the diocese, and it is stated that a faculty permitting the alterations has been granted by the ecclesiastical authority.

Having informed the Council of the present position of matters, the committee, although aware that many persons interested in the subject do not approve of what is being done in this restoration, have not seen their way to recommend the Council to take any action in the matter.

The committee have, however, in the course of their investigations considered some other points not bearing immediately on the special subject in question, and have agreed to submit the following recommendations to the Council:—(*a*) The committee are of opinion that great care should be taken to preserve the old buildings of the town, many of which contain fine woodwork and are of superior architectural merit and better construction than the modern style of house and shop-buildings. With this view they recommend the Council to revise the building by-laws, so as to permit the use of timber construction in conjunction with stone or brickwork, whether for new buildings or the repair of old structures. (*b*) The committee further recommend that an account be taken of all the mural tablets and memorials of the dead which are to be found in the various places of worship within the borough, and that such account should be placed in the archives of the town. The committee believe that the ministers of the churches and chapels would readily assist the Council to obtain a full and accurate list of all such monuments and memorials.

Mr. Marriage, in moving the adoption of the report, said they were in danger of losing some of their old and interesting houses, in which a good deal of timber was used in the construction. Since the report was issued, a fine timber-built house which had stood 500 years had been removed to make room for an inferior erection which probably would not last fifty years. Mr. Marriage alluded to the apparent inability of the architects and builders of the present day to put up picturesque and substantial buildings, and observed that they pulled down the Colchester Town Hall, which had lasted for centuries, and built a new one, which probably would not last another fifty years. He appealed to architects and builders as to whether they could not take some measures, whenever they had an opportunity, of preserving these interesting old structures. As to the second paragraph of the report monuments did disappear from the churches and chapels of the town which might be of great interest to families, and therefore it was very desirable that an account should be taken of those that now existed, so that there might be a reference to them. The report was adopted.

ARCHITECTS' FEES.

IN the Court of Queen's Bench, before Lord Coleridge and a special jury, the case of Eedle and Another *v.* Alston was heard. It was an action by a firm of architects for architects' fees and sums paid, and to quantity surveyors for quantities taken out. The plaintiffs' claim was for architects' fees, 176*l.* 11*s.*, and for surveyors of quantities, 183*l.* 19*s.* 6*d.*—total, 360*l.* 10*s.* 6*d.* The defence, in substance, was that the plaintiffs had been employed to make plans, &c., for certain work, the expense of which was not to be above 2,000*l.*, and that, in fact, it was found that it could not be done under 4,779*l.*, so that the plaintiffs' services were wholly useless to the defendant, and nothing was due to them.

Mr. E. Tindal Atkinson, Q.C., and Mr. Crispe were for the plaintiffs; Mr. Winch, Q.C., and Mr. Haigh were for the defendant.

The plaintiffs carry on business near London Bridge, and on October 15, 1889, the defendant, occupier of the Prince of Wales Hotel, in Paddington, saw Mr. Eedle and told him he desired certain structural alterations in the house, and wished him to prepare the necessary plans, &c., which he proceeded to prepare accordingly. According to the account given by Mr. Eedle of the conversation, the defendant, who was accompanied by his son, said nothing as to the expense, or as to any limit of expense, though as they were going away the son said, "I suppose the expense will be about 2,000*l.*," to which, however, Mr. Eedle said he replied that it would cost much more, and according to him the defendant said nothing at any time as to any limitation of expense. In the correspondence, however, it appeared to be admitted that the defendant had mentioned 2,000*l.* as the amount he could afford to expend, but it was asserted that there were subsequent alterations which would greatly increase the expense. The alterations at first contemplated were only on the basement and the removal of the kitchen to the next floor, and these, it was admitted, could be done for 2,000*l.*, though the parties differed as to whether that sum was mentioned as a limit. But soon other works were suggested, and among others an alteration of the front, to which the next-door neighbour objected, and the superior landlord, whose license was necessary, and for these further plans and drawings were required. The plaintiffs prepared the plans, which had to be submitted by the defendant to the vestry and the County Council, and were not approved by the latter, and new plans were prepared, of which, according to the plaintiffs, the defendant approved, and upon these—in order to ascertain the expense—the plaintiffs employed surveyors to "take out the quantities," and the "quantities" were taken out, upon which builders made tenders for the work, the lowest of which was 4,779*l.*, on which the defendant threw up the design, but employed another architect, and did certain works to the amount he had contemplated. The plaintiffs claimed for the charges of the surveyors who had taken out the "quantities," and also claimed their commission of 3 per cent. on the estimated expense of the works done. The defendant disputed his liability to pay anything. When the nature of the case appeared,

Lord Coleridge said the plaintiffs, no doubt, were entitled to recover something, but they could not be permitted to recover by way of commission on the estimated expenditure. That was a claim which architects might consider reasonable, but which they had never been allowed to enforce. They could only in such a case recover a reasonable remuneration.

The counsel for the plaintiff assented to this.

Mr. Winch, for the defendant, said his case was that from the first he had told the plaintiff Eedle that he could only afford 2,000*l.*, and he read a letter of Mr. Eedle's admitting this, and though, no doubt, he added that there were alterations, yet the defendant was never told that the expense would be increased.

Lord Coleridge: But none of this work was done. No doubt it would be admitted that if the plans had been carried out the cost might well have been 5,000*l.*

Mr. Winch: Certainly, but all through the defendant kept saying, "Mind, you must not exceed 2,000*l.*"

Lord Coleridge: But what was the use of saying that in the face of these drawings and plans?

Mr. Winch: Your lordship is carried away by that fine drawing—the elevation, as it is called. But it never was sanctioned by defendant.

Lord Coleridge: I do not look only at that, but at the whole of the drawings and plans, which showed additional expense.

One of the jury observed that it did not appear that at that time the defendant interposed and forbade any further expense.

Lord Coleridge: No. That is just what occurred to me. I am afraid, Mr. Winch, your client "had a taste!" and he must pay—I do not say all that the plaintiffs claim, but what the jury may consider reasonable. His lordship read a passage in one of the defendant's letters to Mr. Eedle:—"I leave it in your hands to do what is right and proper, only get the estimates as soon as possible."

Evidence having been heard on each side,

Lord Coleridge, in summing up the case to the jury, told them that the plaintiffs were clearly entitled to recover the surveyor's charges, which were reasonable. As to the architect's own charges, he had already said that he objected on principle to a percentage on an amount not expended; and the question would be what was a reasonable amount. But in some cases where the work was headwork and involved skill and experience, it was difficult sometimes to make a charge in any other way, and here the commission charged was small, and at all events the amount charged did not appear to be unreasonable. Now, as to the defence set up, the work had been done, and apparently well done, and the defence was that it was of no use to the defendant. But he knew it was done, and done for him. He set up, indeed, that there was an agreement that the expense should not exceed 2,000*l.*—that is, that there was a guarantee to that effect, for if it did not come to that, it was nothing. And in this case, as in the recent case of Colonel North, though there was a memorandum, there was no mention of the amount. The plaintiff, Mr. Eedle, denied having given any estimate, and it would have been impossible and idle to have attempted to do so until the plans were settled as to what the work would be. The plans were shown to the defendant from time to time, and there were the letters, which appeared conclusive. In one of them, from the defendant to the plaintiff in answer to a letter sending the plans approved, he wrote, "I leave the matter in

your hands," &c. Nor would the defendant swear that he ever asked the architect if the expense would exceed 2,000*l.* Ultimately, no doubt, he threw up the design, and, like a sensible man, resolved not to exceed the expense he could afford. But why had he let the other architect go on so long? Why had he not stopped him at once when he saw the expense would exceed 2,000*l.*? The reasonableness of the charges was not disputed, the only question raised was whether anything was due.

The jury consulted for a few minutes, and then appeared to hesitate as to whether the surveyor's charges should be additional to the architect's, or rather not included in them; and one juror pointed out that 360*l.* was 8 per cent. upon 4,779*l.*

Lord Coleridge said the reasonableness of the charges was really not disputed. The sole question was whether the special bargain had been made—that the expense should not exceed 2,000*l.*

The jury still hesitated, some of them appearing to think that the surveyor's charges ought not to be paid in addition to the architect's.

Lord Coleridge: The defendant himself does not dispute that, if he owes anything, he owes 360*l.* 10*s.* 6*d.*

The jury returned a verdict for the plaintiff for the full amount claimed—360*l.* 10*s.* 6*d.*

THE LONDON AND BRIGHTON RAILWAY BRIDGES.

THE following report by Sir John Fowler, C.E., is appended to Major-General Hutchinson's report to the Board of Trade on the accident that occurred in May last at the Portland Road (Norwood) Bridge of the London, Brighton and South Coast Railway, which, with correspondence relative thereto, has already been published:—

2 Queen Square Place, Queen Anne's Mansions,
Westminster, S.W.: June 17.

Gentlemen,—Mr. Banister has supplied me with full information respecting the cast-iron bridges on the Brighton Railway and its branches. The total number is 171, of very varied size and character. I have not thought it necessary to make rolling-load tests personally, partly because such tests, if properly done, would involve a long time and much interference with traffic, but chiefly because I find such tests have been carefully made from time to time by your engineers, and the deflections observed. These tests, with deflections, have been supplied to me, and I find they agree with the results of my calculations of what the deflections ought to be. I have, however, personally inspected the Victoria Bridge over the Thames, the Ouse Viaduct, the Shoreham Viaduct, and several typical bridges. The Victoria Bridge is a strong and good bridge in every respect, and will be so for very many years. The timber of the permanent-way now requires renewal, and this is being done. Being an arch-bridge, passing trains cause a movement which may be termed "vibration" as distinguished from the movement or deflection of an ordinary girder bridge, which has less vibration, although probably more movement. No anxiety whatever need be felt about the Victoria Bridge. I walked over the ground of the site of the Ouse Viaduct and examined every pier and arch. I found this fine structure, which is exceptionally strong, in excellent condition. The few bricks in special places which have been affected by weather have been promptly replaced by new bricks set in cement. This work of reparation is very trifling, but is evidently never neglected, and the viaduct is maintained in the same sound state of efficiency as on the day of its completion. The Shoreham Viaduct consists of 36 spans of 30 feet each, with cast-iron girders resting on timber piers. The time has arrived when this viaduct would require renewal in a few years by substituting iron cylinders for timber piers, and wrought-iron girders for cast-iron. I recommend, however, that this renewal be carried out as soon as arrangements can be made, and whilst the viaduct is in a perfectly safe state. Being a work of some magnitude it will occupy longer time than any other work of renewal, and I think it will be more convenient and economical to construct a new viaduct alongside the old one, and thus avoid all interference with traffic, and afterwards connect the ends with the old line by short curves. Besides the Shoreham Viaduct there are about twenty bridges which, in my opinion, should be reconstructed by the substitution of wrought-iron (or, preferably, steel) or cast-iron during the next twelve months, or sooner if possible, and about sixty other bridges should then be reconstructed. Before any actual steps are taken with reference to the works of any bridge I advise a very early conference with Mr. Banister, the manager of the traffic department, myself and Sir Benjamin Baker, with a view to settle the best order to be taken with the work, having reference to traffic convenience, season of the year and other considerations, it being understood that all the eighty or eighty-one bridges are to be reconstructed in the shortest time reasonably possible and not exceeding two to three years from the present date.

The advice given in this report for the gradual reconstruction of the bridges is based upon considerations affecting the vast majority of railways in the kingdom, viz. the great increase in the weight of modern locomotives and the superior endurance of wrought-iron or steel as compared to cast-iron when high speeds, heavier engines and consequently a greater vibratory action has to be provided for. The result of my investigation does not indicate any unusual weakness in the Brighton bridges, which are neither better nor worse in that respect than those on similar lines of railway at home or abroad.—I am, &c.,

JOHN FOWLER.

To the Directors of the London, Brighton and
South Coast Railway.

WESTMINSTER ABBEY.

(*Concluded from page* 14.)

A SOMEWHAT similar proposition, also accompanied by a ground-plan, was submitted to us by Mr. Somers Clarke, F.S.A. It differed from Mr. Pearson's plan in that it would cover the sites of Nos. 1 and 5 Old Palace Yard, in addition to those of Nos. 2, 3 and 4, and would present a frontage almost identical in line with that of those five dwelling-houses, the leading principle and greatest attraction of both schemes (that of Mr. Pearson and that of Mr. Somers Clarke) being that the new building would be actually united with the Abbey church by a covered way. This advantage was clearly explained in the following question and answer:—

"Sir H. Layard: Your plan is to have a separate building under a separate roof, but still in connection with the Abbey, that people making the tour of the church would pass through it, or into it as part of the Abbey itself?"

"Mr. Somers Clarke: Yes. The whole thing would be one continuous scene in their eyes, and could not be more incorporated." This view was also strongly urged by His Grace the Archbishop of Canterbury.

Of these two proposals, that of Mr. Pearson appears to us to be less open to the serious objection that the erection of any structure on a site cleared by the removal of the Old Palace Yard houses must inevitably have the effect of masking more or less the beautiful outlines of the chapter-house and of interrupting the view of the chapel of Henry VII. Mr. Pearson himself acknowledged the inexpediency of again concealing the chapter-house and adjacent parts of the Abbey from view, and, in order to meet the objection, he prepared a modified plan in all respects similar to the former, save that it would occupy a site 25 feet further to the south, and would therefore, he considered, be less open to criticism. In this opinion we agree, and we should not hesitate to recommend the adoption of such treatment of the site at Poets' Corner, if it should be considered that no better place for the required monumental chapel could be found.

It remains for us to consider—

4. *The Utilisation of a Vacant Space Adjoining and Communicating with the South Side of the Great Cloisters.*

In dealing with the proposed adoption of a site on the south side of the great cloisters the details of the ground plan of the Abbey precincts must be kept in view. The boundary of the great cloisters on the south is denoted by a double line indicating the position of a wall of greater thickness than that of others in the immediate vicinity, and extending from the site of an ancient tower near the entrance of the deanery premises to the northern extremity of the dark cloister. This wall, which is more than 150 feet in length, was, in fact, a party wall, forming at the same time the southern boundary of the great cloisters and the northern limit of the ancient refectory of the Abbey, "a magnificent chamber, of which the lower arcades were of the time of the Confessor or of the first Norman kings, the upper storey which contained the hall itself being of the time of Edward III." It is pierced by a wide doorway, which exactly faces the west walk of the great cloisters, and is directly opposite to a corresponding entrance opening into the nave of the church, so that the west walk forms a vista from the refectory site to the interior of the Abbey. The wall is in fair preservation considering its great antiquity, and rises to a height of 34 feet, being about 12 feet above the roof of the adjoining cloister. On its south face the wall is exposed for the greater part of its length, the remains of its ancient arcading and remarkable architectural features being plainly visible from the courtyard at the back of Ashburnham House; while the only structures on that side which at present interfere with its integrity are a few subordinate buildings of recent construction and no special interest or value, some of them having been erected by way of a cheap enlargement of the outbuildings of Ashburnham House, and others, which are little more than sheds, being the workshops and lumber-rooms of masons and

other workmen. In fact, the removal of a few modern brick structures on the south side of this wall would clear an area of about 130 feet long by nearly 40 feet broad. It will be seen, too, that this space or site is in the very centre or core of the ancient Abbey precincts as indicated by the dotted line enclosing them on the plan; and it may be added that not only was the refectory, which stood on this plot of ground, a building devoted to the purposes of the inmates of the Abbey, but that "it was a chamber only inferior in size and beauty to Westminster Hall." A great Council of State was held within its walls by Henry III. in 1244, a great assembly of clergy and laity by Edward I. in 1294, and various conventions of the Commons of England from time to time, notably in the reign of Edward II. for the impeachment of Piers Gaveston; and on several occasions during the reigns of Richard II., Henry IV. and Henry V. The rescue of this site sooner or later from its present prosaic purposes seems desirable, if for no other reason, for the sake of that historical continuity of which the Abbey, as a whole, is the embodiment and the symbol.

We are not unmindful that a difficulty in the way of an immediate adoption of the refectory site might be found in certain circumstances connected with the transfer in 1881 of Ashburnham House from the Dean and Chapter of the Abbey to the governing body of Westminster School, which were the result of somewhat hurried legislative action, taken in the year 1868. One effect of the erection of a chapel upon the site of the "refectory," of which the garden at the rear of Ashburnham House forms a part, might be to obscure to some extent the "ancient lights," of which the right of enjoyment is, presumably, vested in the owners of the latter building. This difficulty, as well as others which might arise from the same circumstances, need not, in our opinion, arouse alarm. It is in evidence that a structure erected on the ground, and to the height of the ancient refectory, would be "far enough from Ashburnham House not to interfere with the light, except in the case of one classroom," and any such disturbance would be a matter to be adjusted, if necessary, by the payment of a very moderate sum as compensation. It may be remarked that the only purpose to which the garden has been put by the authorities of the school has up to the present been the construction of a latrine at one end of it; it is not used by the school even as a playground; the grass and weeds which cover it are untrodden, and there would seem to be some doubt as to the exact extent of the appurtenances which passed to the governing body with Ashburnham House itself under the Act of 1868.

With regard to the architectural possibilities connected with the adoption of the refectory site, we have had the advantage of the advice of Mr. Pearson, who, having fully considered the suggestion, gave it as his opinion that it was quite possible to erect "a charming building" on that site, and that "the site would lend itself very readily to such a purpose."

Mr. Pearson proposed "to add a row of columns along the north and south sides of the building and to groin over the whole space in stone. The arcading which exists in the north wall could be preserved, and the difficulty which has been suggested of supporting any roof on this wall could be got over by building columns in advance of the wall, and then, at the level of the top of the Norman arcade, turning arches over the intervals, which would carry the walls; these walls, together with the columns, would form abutments for the arches and groining above, and recesses would by this treatment be formed, in which the existing windows of the upper part of the north wall of the refectory would come. The arches, which would be pointed, and which might form a handsome and interesting feature of the suggested monumental chapel, would reach up to the sills of the windows, but they would not go above them. The other arches would run from west to east, and extend up to 30 feet in height, making a sort of aisle, as it were.

"In that way the antiquarian beauties and value of the old wall would be entirely preserved, and there would still be room for monuments for a long time to come. On the opposite side the same treatment would be carried out, and there would be ample space in the nature of recesses for monuments."

Mr. Pearson prepared for us a perspective sketch of the inside of such a chapel, showing the effect of the treatment he had suggested in the passages above quoted, and he roughly estimated the cost of such a building at about 30,000*l.*

It would seem that the area of this chapel, or annexe, if built so as to occupy the portion of the proposed site immediately available, would be little less in length than that of the chapel of Henry VII., or of St. Margaret's Church, and of a width of 37 feet, and that in such a building room would be found for national commemorations for one hundred or two hundred years to come; and it has been suggested that it might be the first instalment of a larger design for covering later on the whole extent of the refectory and Ashburnham House, should it ever be restored to the Abbey, with another cloister, of which the proposed chapel should form the northern side.

The adoption of this plan has, in our opinion, a further special merit, which is not shared by any other which has been brought before us, namely, that such a chapel as it is proposed to erect upon the refectory site would be hardly, if at all, visible from the outside, and therefore could not interfere or come into comparison with the chapel of Henry VII., the chapter-house, or any of the other older buildings. It is agreed that the additions proposed in the various other schemes submitted to us should be at once in harmony with, and subordinate to, the ancient edifice; but, however skilful the architect who might be chosen, his work must necessarily run the risk of being deemed either an insignificant appendage, or, if ambitious in its design and details, a presumptuous rival to the Abbey.

SANITARY ARRANGEMENTS ABROAD.

IN a report made to the Mayor of Philadelphia by Dr. Keyser on systems of sewerage and sewage disposal the following passages occur:—

I found in Berlin a complete set of sewers running through the city, which, uniting in larger ones called conductors, carry the great mass of sewage to the places of deposit, where machinery is erected to pump it out, as the river Spree, which is a small sluggish stream running to the city, cannot be used as a receptacle or dumping place for anything. Nothing but surface water, waste from yards, kitchen and water-closets is permitted to run into the sewers. Even to prevent the great quantity of the dirt from the ordinary dropping of the horses and wear and tear of the streets, men are continually employed gathering such waste together and depositing it in ornamental iron receptacles, which are to be seen in every square, from whence it is removed at night by carts. No bits of paper, garbage or débris of any kind are suffered to be thrown into the streets. These are collected in bags or boxes, and hauled out of the city for whatever use they can be put to. Everything, more or less, is put to some use in one way or the other. Waste as in this country is really unknown. All of the sewage matter is used for cultivation around the city. Berlin was founded on a barren sand plain, and for a long time all the fruits and vegetables were brought into the city from distant parts of the country. But since the utilisation of sewage matter the surroundings of Berlin have become magnificent fertile tracts, developing gardens producing almost everything necessary in the way of food for the inhabitants.

To make this sewage useful sewers were built in every street, large and small, according to the character of the street, and uniting into a system which carries the matter into large places or basins from which it is pumped up to give it flow into other canals or sewers running out into the country. As the whole territory around is very flat it is necessary to have stations for pumping the water up to get the required elevation to give the further flow to extend to certain distances. From these stations it runs into many canals, which are connected and can be shut off as needed. The smaller canals run throughout the country, irrigating the soil and permitting the deposit of the solid matter as it runs along. This solid matter is at times scraped out of the canals and thrown on the land, making very fertile soil.

From Berlin I went to Dresden, which I found a very clean city, with a system of sewers not as thorough, but sufficient to relieve that city for its present needs. The river Elbe running through the city, dividing the old from the new parts, is a large, swift-flowing stream, in which the sewers empty, and everything is carried down in the rapid flow. I next visited Frankfurt-on-the-Main. The country around the city of Frankfurt is so good for all character of cultivation that it is not needed to irrigate with the water from the sewers, and here is found a different system for the disposal of the sewage. There is the same arrangement as to the cleanliness of the streets as is found in all the cities in Germany, and nothing but the surface-water and that coming from the kitchens, yards and water-closets passes into the sewers. There is a regular system of sewers, small and large, running throughout the city, and all make final connection into a large one which runs along the river front and down below the city a distance, when it dips under the river, crossing over to the other side to a large works called Klarbecken Anlage (works of the settling basins). As this large sewer reaches the left bank of the river, it is met by one coming from Sachsenhausen, an old town which is now part of Frankfurt, but on the opposite side of the river. These settling basins are made quite deep under the ground, so as to get the proper fall for the sewer-water to run into them. As the water, which comes with quite a force, enters the works it runs over grates or sieves to catch the larger particles of stuff that may be carried along the stream. These large particles are shovelled off by men constantly, day and night, and hoisted up to the surface and deposited in a place therefor, from whence it is sold and hauled away. Destructible matter which would decompose is burned. After passing over the grates the water runs into the settling basins, which are 6 mètres wide at the top, 5·4 mètres at the bottom and 82·4 mètres long. At the entrance 2 mètres and exit 3 mètres deep. There are two sets or series of these basins, with six in

each, making twelve in all. Each basin has the capacity of 1,100 cubic mètres, so that the water in each remains six hours. The rapidity of flow is equal to five in and three out, at an average of four m. m. per second. Each group is calculated to receive a normal flow up to 20,000 cubic mètres, and in stormy weather a flow up to 40,000 cubic mètres per day. The whole works are arranged for 40,000 to 80,000 cubic mètres per day. These basins are covered with arches of brick, with many large air-holes to admit light and air. To destroy any odour or deleterious action of the water, an arrangement is made to mix two solutions—one sulphate of thonerde (clay), the other lime—with it, just as it is about going into the basins. These solutions are made by machinery, and run through tubes with many holes, and are placed just over the duct as the sewer-water comes through the sieve to the settling-basins. These mixtures destroy all deleterious matter and action, and cause the solid matter to settle by the time the lower end of the basin is reached in the regular course of the flow. At the lower end of each basin is a large gate, which can be raised when necessary to cleanse or make repairs. These gates are kept closed, and the water passing over is perfectly clear, and is run into the river Main. The slimy settling from the water flows to the lower part of the basin, and is pumped out by steam machinery and deposited in spaces or vats made for it just beyond the works. From here it is taken away free of expense by the farmers in the neighbourhood, who come for it in waggons or ship it in boats up and down the river to more distant places. In connection with the sewers there are in different parts of the city high beautifully-built ventilation towers, which carry off all the gases so that nothing rises up from the openings in the street. These towers are very ornamental and not in the least objectionable.

In Paris there is a complete system of sewers, large and small, and only surface water with that from the yards, kitchens and water-closets is permitted to flow into them. At one time the sewers emptied into the river Seine, which divides the city, but these outlets are now all cut off by large sewers called conductors, which convey the contents to the outer parts of the city for utilisation in irrigating and cultivating the surrounding country. The whole system is a perfect one, and of much benefit in the production of fine fruits, vegetables and flowers. In the collecting and removal of cesspool matter there are at present four systems—the permanent, the movable, the filter and the sewers. The permanent is the oldest method, which consists of a large cesspool in the courtyard of each house into which the waterclosets drain, and when the pool is nearly full its contents are pumped out at night and carried away. This system, although not introduced into any houses the past two years, is still the most in use, there being 64,700 such pools in the city. The cleansing of these is done by steam pumps in charge of a company, who take the matter out to dumps in the country, where they have factories to manufacture sulphate of ammonia by distilling the liquid after the separation of the solid and making poudrette from the latter. In the outskirts of the city the cleansing of the sinks is still done by old hand pumps. The movable system is that of receptacles like barrels, crocks, &c., with covers, which are stood in the closets on the different floors of the houses and removed when full. This removal is done in the day time. They are cumbersome and very unhealthy. The use of such receptacles is decreasing very fast. There are 17,700 in use. The filter system is much used, there being 33,800 in existence. This is composed of a cistern of masonry having a filter pipe running into the sewer. In the centre of this cistern stands a tub into which the pipes from the closets open. The solid matter flowing into this tub settles therein, while the liquid flows over into the surrounding cistern, to pass out through the filters into the sewer. It is the purpose to clean the inside tub when full before any of the solid matter contained therein can run over into the cistern and block up the filters. But this is not always attended to in time, and when an overflow occurs the whole affair becomes a filthy, dirty place, and becoming infectious, is a great source of disease. To get rid of all such infectious spots, a law was passed in 1886 requiring all closets and slop drains to be connected directly with the sewer.

The sewer system is well known and similar to that used here in this city, except in the sizes and shapes, the only difference being in that which is permitted to flow therein. Great care is taken that no solid particles, such as vegetables, papers, &c., are permitted to be thrown down the inlets nor into the streets. Any one throwing such into the street is obliged by the police to pick them up at once and carry them away. The sewage water is carried to the outskirts of the city in different directions to stations, where it passes over iron gratings or sieves to separate the larger particles that may unavoidably get in, and runs into a reservoir, from which it is pumped up into another reservoir, raised 10 or 12 feet above the surface of the ground, to give it fall enough to cause it to run into and through many ditches in the land to be irrigated. The openings in these elevated reservoirs are in the bottom, so that the settlings can run out with the flow. This system is an excellent one, and is of great utility to the surrounding country. The final running of the water from these irrigating ditches is perfectly clear and pure (by chemical tests made continually on the spot), and runs into the river.

In passing through the sewers I was surprised at the loss of odour. Nothing unpleasant was found. The sewers are constantly flushed by letting water run in the different streets daily at stated times. This is nicely done by an arrangement much better than our unsightly fire-plugs, and the stream is not thrown out into the streets, but only in the gutter, where the hydrant or plug is situated.

In reviewing the different methods as to their utility and adoption for this city, I must say that the surroundings of Philadelphia are such that the system in use in Berlin and Paris could not be applied here. There are no sandy or unfertile lands in the neighbourhood which could be irrigated, and only in New Jersey, on the opposite side of the Delaware river, can such be found, but too far to be reached, and even to do so it would necessitate the passing under the river, which is impracticable. It therefore narrows down to the one system—that of Frankfurt-on-the-Main.

Correspondence

What is an Artist?

SIR,—There has recently been a discussion on architecture and its relation to art. Architects, in my opinion, are artists because they are something else in addition, or, to put it in another way, few painters are artists because few are practical men, except where their individual interest is concerned. I venture to think that architects would not absorb the membership of a Royal Academy to the exclusion of painters and sculptors, as the painters in the Royal Academy virtually do, by practically excluding all the arts but painting. I also venture to think that an architect's conception of a saint would be different to Mr. Calderon's beau ideal, notwithstanding that his idea appears likely to immortalise his name, along with those of the Chantrey Trustees, on the roll of funny people. An architect has to think before he designs, as the best of architects and painters always have done. Modern painters, however, are able to dispense with meditation and historical knowledge when dealing with ecclesiastical subjects. Curious ideas are found where ecclesiastical art is concerned—the two mosaics in St. Paul's Cathedral, for instance. They occupy two adjacent spandrels in the dome. The second of these has been placed in the cathedral within the last week by Salviati. It is supposed to represent the prophet Daniel. The other mosaic, which at the foot bears the name of St. Matthew, represents the typical city magnate with a fashionable modern beard signing "the minutes of the previous meeting." The staid air of the business man is admirably rendered in the countenance. In default of a table a she-dragon with preposterous wings, as though representing one of many attempts in the production of a flying machine, is holding the book for him, while behind the Lord Mayor, say, a figure of a human type, and by no means angelic, if the budding wings are left out of calculation, having no work to do, is apparently looking out for a job. The introduction of gold and colour is, however, a great improvement to the dome, and the subject as representing the Lord Mayor and the griffin would be perfection in the Guildhall. In the second mosaic just erected Daniel would never recognise himself in the prizefighter form of man with the handsome countenance, who appears to be stretching himself after a nap, subsequently—judging from the lock of hair hanging down over his forehead—to having dined exceeding well. An angel above is balanced by another—angel, I was about to write—though the effect is that of an acrobatic bundle of linen done up for the washerwoman. A head is attached to the bundle, and there is a suspicion of impossibly-placed feet. These two objects are engaged in some mysterious operation over Daniel's head, if Daniel it be, indeed. They are probably snapping a bonbon cracker, stolen from the dinner-table, just as the awakening takes place. The drapery is certainly original in its treatment, to say the least. The moral seems to be:—Paint your picture or execute your decoration first, and then get a friend to give it a name. It is to be hoped that no painter will attempt to depict St. Catherine as a lady cyclist, but there is no knowing. If art and craft is to excel amongst us it will be through the help of architects rather than of painters, and to architects and other artists, excepting painters, is mainly due improvement in our arts and crafts, as also for the inspiring of love for art workmanship and the spirit of emulation to excel.

Yours truly,

ARTS AND CRAFTS.

Westminster Abbey.

Sir,—The labours of the six members of the Royal Commission appointed to inquire into the want of space for monuments have resulted in a deadlock, three recommending the erection of a chapel to the east of the Abbey, and the other three advising that one be built to the south of it. As to Mr. Pearson's north aisle scheme, they are unanimous in rejecting it, though the architect said in his evidence "he had a great love for such a solution of the problem." They admit that "neither of these (the above chapels to the east and to the south) would provide a building in such immediate contact with the main body of the church." Very good reasons ought to be forthcoming before a plan is sacrificed which provides what has all along been made an ultimatum for building any chapel at all in connection with the Abbey. The Commissioners go on to say, "We do not believe that the slightly greater distance at which they would stand could seriously hinder them from gradually sharing with the Abbey the place which it alone now holds in the feelings of the people," and they speak of "the unpopularity which would certainly beset its adoption." The Commissioners may be right in their estimate of the "feelings of the people," but much might be said against it. Then, to support their views on this point, they give the Archbishop of Canterbury's objections, which, however, are rather of the nature of recommendations, unless we are to admit that such adjuncts to our cathedrals as chapels, chapter-houses, cloisters, &c., do not add to their beauty and picturesqueness. This is what his Grace says of the north side :—"It is the only part of the Abbey in which you see the whole design of the church by itself, the south side is so entirely blocked up by other buildings, and the east end so altered by Henry VII.'s Chapel . . . the projection of the chapter-house is so great, and the alteration of the west end is so great, that there is no other part of the Abbey which gives you an idea of what was the original design of it as a great church." Well, Dr. Benson will not object to artists differing from him, and I therefore venture to say that, if asked to give the most beautiful view of the Abbey, they would decline to waste time on one from the north-west "showing the whole design of the church by itself," but would draw with delight a view from the south-east showing "Henry VII.'s Chapel, the projection of the chapter-house" in harmonious connection with the glorious Abbey itself as a background. Of course this is matter of opinion; but even a doctor of divinity will admit that it is an artistic question with which divinity has nothing to do. It is the nakedness—the modern nakedness—of the north side that at once suggests to artists and ecclesiologists that it is the most fitting site for an additional building, whether it be an aisle, a cloister or a chapel.

Surely something more than this deadlock was expected from this august Commission when it was agreed to incur the expense of it. What will Mr. Shaw-Lefevre, who has given so much time and careful study to this question, and who gave up his motion in the House of Commons for a Special Commission at the request of the Government, say to this absurd imbroglio? I apprehend that the House did not agree to leave this matter in the hands of the Government for so negative a result, and I presume therefore that, after all, a Special Commission, bent upon business, will have to be appointed, for on one point the six gentlemen are unanimous, viz. that there is no further room in the Abbey for future monuments commemorative of the nation's illustrious dead. Benedict.

The Eight Hours' Movement.

Sir,—Mr. Renton Gibbs, the well-known heating engineer, St. James's Works, Liverpool, having decided to give the eight hours' movement a fair trial, has accordingly arranged with his workpeople for a forty-eight hours' working week; and this he has done without any solicitation from the men, and with the view they will so appreciate this change that it shall become a permanent arrangement; for although this will necessarily cause a considerable increase in the wages, it is believed that by less hours' labour the men will be the better able to perform their daily work, and thus recoup their employer for this welcome concession. The Workers.

The Chester Corporation called in lately Sir John Coode to give an opinion as to the practicability of erecting floodgates in the river Dee at the old bridge, so as to prevent the sewage from being carried up the river to contaminate the water supply of the city. Sir John, who has sent in his report, states that damming the river as proposed is practicable, but holds that it is inadvisable, as it would prove detrimental to the shipping interests on the river. He suggests the advisability of removing the present intake, and the possibility of the sewage being diverted from the river and passed to a sewage farm below the city, or being dealt with by chemical processes.

GENERAL.

The Youngest Artist who has attained the honour of a medal at the Paris Salon is Mr. Harry Vander Weyde, who received his honours on July 2. He was born in Boston, is a descendant of the famous fifteenth-century old master of that name, and son of Major Vander Weyde, one of the veterans of the army of the Potomac, and now a well-known photographer in London. The young artist has also a picture in the Royal Academy.

The Full-length Portrait of Mr. Felix Joseph, by Mr. Knighton Warren, which the Corporation of Nottingham commissioned some months since for their Castle Museum, and which has been much delayed through Mr. Joseph's serious illness, is nearly completed, and will be on view at Mr. Warren's studio in the course of a few days.

The Dean and Chapter of St. Paul's Cathedral have given permission for the erection of a memorial to the late Right Hon. Sir John Macdonald in the cathedral.

An Heraldic Exhibition, organised as an adjunct to the forthcoming Archæological Congress, has just been opened in the Scottish National Portrait Gallery, Edinburgh.

The Wellington Monument, near Wellington, Somerset, is to be restored. The cost, including the building of a caretaker's house, is estimated at 1,200*l.*

The Court of Common Council have increased Sir John Monckton's salary as Town Clerk from 3,000*l.* to 3,500*l.*

Sir John Hawkshaw has bequeathed 500*l.* to the Institute of Civil Engineers, of which he had been president. The personal estate has been proved at 218,549*l.*

The Appointment of a surveyor to the estates of the Skinners' Company is announced, Mr. E. H. Burnell having resigned after thirty years' service. Applications are to be sent in to Skinners' Hall, Dowgate Hill, by Tuesday, the 14th inst.

Mr. A. Nelson Bromley, of Nottingham, has secured first prize in the competition for the Bury Municipal Buildings. Mr. H. T. Hare, of London, obtained second prize, and Messrs. Everard & Pick, of Leicester, third prize. In the competition for the Bury Market Buildings, Mr. A. Neill, of Leeds, obtained first prize, Messrs. Hornblower second, and Mr. H. B. Buckley third prize.

Messrs. Quilter & Wheelhouse, of London, have obtained the premium of 15*l.* offered for a design for the Oddfellows' Hall, Stafford.

M. Wyse has brought forward a scheme for the completion of the Panama Canal. It consists in creating a great inland lake, which would be reached by three locks on either side.

Mr. Freeman has just been re-elected city surveyor for Dublin.

A Society of Architects is proposed to be formed for Bedfordshire, the objects being (1) to promote personal acquaintance and good feeling amongst members of the society; (2) the general advancement of architecture in the county; (3) the maintenance of the interests, status and uniformity of the practice of the profession; (4) to consider questions of general practice; and (5) to promote the education of junior members of the profession.

The Library Committee of the Bolton Corporation invite designs for a branch library to be erected on land at the south-west corner of the Town Hall Square.

The Gloucester Archæological Society will hold its sixteenth annual meeting at Moreton-in-Marsh and Oxford on the 14th and three following days.

The Death is announced of Mr. R. C. Reade, M.A., diocesan architect of Torquay. Mr. Reade had been bathing in Compass Cove, Dartmouth, and it is supposed that in trying to reascend the cliffs he lost his footing and fell on to the rocks beneath.

The Board of the London Homœopathic Hospital, Great Ormond Street, have instructed Mr. William A. Pite, A.R.I.B.A., to prepare plans for a new hospital to be re-erected on the present site.

The Prizes have been awarded as follows to students of the classes in University College, London :—Architecture (under Professor T. Roger Smith) :—Fine Art—Donaldson Silver Medal, A. E. Kirk, of Leeds; prize, W. E. Hazell, of London; certificate, T. G. Lucas, of Hitchin; second class, H. E. Church, of Clapham, H. E. Matthews, of London. Construction—Donaldson Silver Medal, H. C. Corlette, of Sydney; prize, G. Gonsalves, of Trinidad; certificates, W. H. H. A. Kettle, of Brentwood, F. K. Kendall, of Blackheath; third class, W. J. Keith, of Ealing, E. Lyon, of Valparaiso, P. E. Newton, of Sydney, E. H. Terry, of London, R. M. Whellock, of Nunhead. Modern Practice—Prize, J. Borrowman, of Godalming; third class, T. H. Bishop, of Leighton Buzzard, C. W. Dawson, of Croydon.

The Architect.

THE WEEK.

On Tuesday the Hanover Chapel Bill came before the House of Commons on the second reading. Lord Cranborne explained the character of the measure. The chapel was not well attended; it stood in need of repairs that would cost 500*l.* or 600*l.*, and there was no fund available. The Duke of Westminster therefore offered a site worth 20,000*l.* for a new church, and powers were sought in the Bill for the sale of the building—probably to the Crown—and to apply the money in the erection and endowment of a new church. His lordship considered that any architectural reasons that could be brought forward would not weigh against the substantial arguments in favour of the Bill. Mr. Norris moved that the reading of the Bill should be postponed for three months. He pointed out that petitions against the Bill came from the Royal Institute of British Architects and the Council of the Royal Academy. He considered it was a desecration to destroy such old edifices. Colonel Makins said the church was only sixty-five years old; the real question was the convenience of the parishioners, and the House would be paying too much attention to sentimental objections if the Bill were rejected. Mr. Isaacson, as one of the oldest inhabitants of the parish, said the passing of the Bill would be a great boon to the people of the West End. Mr. Beadel said the church failed to answer its purpose. Mr. Labouchere opposed the Bill because, if the church was removed, it was only fair that the land, or its value, should be given back to the nation. Mr. Courtney said the question was whether it was for the convenience of the neighbourhood that the proposed change should be made. There were 107 in favour of the second reading and 91 against. A larger majority was to be anticipated, for the weight of argument was in favour of the Bill. The opponents, as is usual in measures relating to buildings, did not master their case, and it is a pity so important a part was assumed by Mr. Norris, who evidently considered the church was ancient. It is worth noticing that there was no recognition of the architectural value of the work.

A gentleman who had more than the average amateur's skill in art has lately passed away. This was the late Dr. Giron de Buzaremgues, who died in his eighty-sixth year. Originally he was trained as a doctor, and he practised in Paris for about twenty years. Then he was fascinated by politics. He was elected deputy for l'Aveyron, and as a staunch Imperialist he rose to the presidency of the Conseil-Général of the district. On the fall of the Empire he entered with ardour into the study and practice of art. Some of his figures appeared in the Salon. He also formed a valuable collection of ancient masters.

The report of the Improvements Committee of the London County Council shows that alterations are contemplated which will cost over two millions sterling. First in importance is the widening of the Strand, which will cost at least 501,500*l.* The committee recommend:—"(*a*) That the Council do apply in the next session of Parliament for powers to remove the block of buildings on the south side of Holywell Street, and to deal with the enclosed spaces, together with the public conveniences adjoining the churches of St. Mary-le-Strand and St. Clement Danes. (*b*) That provision be made in the Bill that the owners of the property, which by the removal of the block of buildings on the south side of Holywell Street will become the north side of the Strand, shall contribute about one-half the cost of the improvement by means of an improvement rate, the remainder of the cost being paid by the Council." Various schemes for more direct communication between the Strand and Holborn were considered by the committee. The one recommended is that for the formation of a new street 90 feet wide from the Holborn end of Little Queen Street, running straight in a southerly direction, passing between Freemasons' Tavern and the Sardinia Street Electric Lighting Station, intersecting Great Wild Street, Vere and Stanhope Streets, to the point where Drury Lane is intersected by White Hart Street and Blackmore Street, and then gently curving to the Strand, taking in the east corner of Catherine Street. The object of bending the street in this direction is to provide an easy gradient. The estimated cost is 933,000*l.*, including 121,000*l.* for rounding off the corner of Wellington Street. To make the thoroughfare a first-class one it is suggested that some novelty should be introduced, such as projecting galleries somewhat similar to those in the Rue Rivoli, Paris, and in Turin, or some system of glazed roofing, of which the gallery at Milan is suggestive; otherwise provision should be made for the planting of trees. Other improvements are the removal of Boziers Court, Tottenham Court Road, cost 50,900*l.*; widening of Nine Elms Lane, Battersea; widening of Battersea Park Road; widening of Bell Lane, Middlesex Street, a southern approach to the Tower Bridge. The total estimated cost, after deducting contributions, but without reckoning amounts to be received from the "Strand Improvement Rate," is 2,133,625*l.*, which is equivalent to a charge on the rates for net cost the first year (diminishing annually) of 0·7223*d.*, or rather less than $\frac{1}{4}d.$ in the pound.

On Tuesday the annual meeting of the Society for the Preservation of the Monuments of Ancient Egypt was held at Burlington House. The report did not record much success. During the year the energies of the Society had been directed principally to two points—the necessity for an official inspector or superintendent in Egypt, whose duty should be the care of the ancient monuments, and an endeavour to do something towards arresting the gradual destruction of the Great Temple at Karnak. Reports concerning a proposed scheme for barring the Nile below Philæ to make a vast reservoir for purposes of irrigation had appeared in the public papers from time to time, and recently various more definite communications had been received by the committee on the same subject. The result would be, it was acknowledged, to completely cover this beautiful island and temple with water. There had been some correspondence on this subject with the authorities in Egypt; but as nothing had as yet been decided as to any scheme of irrigation, and as a committee would be appointed to consider the whole question, it might be considered as suspended for the present, and the committee had thought it best to wait before taking any further action; but they would not lose sight of this important matter, and would oppose to the utmost of their power any engineering scheme which would involve injury or destruction to this world-renowned spot.

In *Black and White* of July 11 an article entitled "A Conception of Westminster Abbey as it would have been" is published. The article is accompanied by three sketches from the pencil of Mr. H. P. Burke-Downing, A.R.I.B.A., one showing the Abbey as it is, while a second gives Mr. Downing's conception of the Abbey if completed according to the probable intention of the original design. Mr. Burke-Downing's scheme includes a central tower, the height of which has been kept subservient to the general grouping of the building, and because it was probably the intention of the builders to keep the lantern low, judging from the lightness of the supporting piers. Wren's towers are replaced in the sketches by Gothic towers, in harmony with the general design. The third sketch shows the north transept as now restored, and also includes the proposed new central tower. As suggested by the article, there is nothing exactly new in a proposal for a central tower. Designs for a completion of the Abbey on what are supposed to be the lines of the original designers have been made from time to time by well-known architects; but this, we believe, is the first time an architect's design has been published. Mr. Burke-Downing advocates that there should be no interference with Wren's towers, while he shows that there can be no objections from a sentimental or structural point of view to a central tower. If Mr. Downing's suggestion is the means of rousing practical interest which will result in some such adequate restoration being taken in hand, he will have done good work in directing public attention to the matter.

ITALIAN ARCHITECTURE.*

THE instalment of M. PLANAT's admirable encyclopædia which is being issued to subscribers is of a character that would almost justify its appearance as a complete work. A volume that contains exhaustive articles on Gothic architecture, especially the German and English varieties, Greek architecture in general, the architecture of the Ile de France, Indian architecture, Italian architecture, the architecture of Languedoc, the Ionic order, Latin architecture, with others on Workmen's Dwellings, Commissions, Hospitals, Gardens, Hotels, Dwelling-houses (*hôtels privés*), Jubés, Covered Markets, &c., has manifestly a completeness which seems to be due to foresight rather than to the contingencies of alphabetical arrangement. All the articles, like those in the preceding volumes, are adequately illustrated by cuts that have been specially prepared. M. PLANAT continues to be lavish in expending money on his encyclopædia, and we trust he will receive the recognition to which he is entitled.

Every one of the articles is deserving of careful notice, but for the present we must confine our attention to the account of Italian architecture by Signor ALFREDO MELANI, a gentleman who labours with assiduity in order to make the art of his country better known and appreciated throughout the world. In this case he is not satisfied, like so many historians, with putting down the dates of the erection of buildings in proper order. The principal object of the article is to show how the Italians were not satisfied with deriving inspiration from foreigners, but at all times possessed native schools of architects, among whom independence and invention were fostered. In taking this side, Signor MELANI follows Signor DESPOTTI-MOSPIGNOTTE, whose "Della Razionalità Architettonica" appeared in 1852.

That even in a prehistoric age there were builders in Italy who could impart a special character to their work is evident from the remains of polygonal masonry at Fiesole and Volterra, and of rectilinear work, afterwards known as *opus quadratum*, at Rome and elsewhere. The Etruscans, who for the purposes of the argument can be taken as Italians, were, as constructors, far in advance of other peoples, and were the pioneers of sanitation. But it is, of course, impracticable to discuss questions of priority relating to work in so remote a time. There is less mistiness in considering such a subject as Doric. In the book mentioned above it was maintained that the characteristics of the style were known in Italy at a period when the Greeks had not got out of that nebulous state which is not favourable to art. Signor MELANI says there can be no doubt that the earliest Greek examples of the style are less primordial than in Italy. In one country the development can be pursued out of primitive forms onwards, and subsequently through tokens of decadence; while in Greece, of the tentative efforts there are few traces. At a later time a similar course appears to have been followed in relation to the Corinthian order. According to Signor BASILE, a Sicilian architect, the Corinthian of the Temple of Vesta at Tivoli has nothing in common with the Corinthian of the Temple of Jupiter or with the Choragic Monument at Athens, while it appears to belong to a class that has representatives at Palestrina, Pompeii, Solonte and elsewhere.

It is held by Signor MELANI that the architecture of Rome itself was grafted upon Etruscan work, and had acquired a character of its own prior to the exercise of Greek influence. Up to the third century of the Christian era the temples were erected by Etruscan architects; it was subsequently that the imitation, often cumbrous enough, of Greek forms came into favour. They possessed native examples of arches and vaults, as well as of columns called Corinthian, and there was no need to import similar, although more graceful, forms. Hence at a later period, when the study of Roman remains was pursued with ardour throughout all parts of Italy, there was not only an acknowledgment of the greatness of the city, but at the same time a recognition of a native principle in art. The Italians were ready to admit the supremacy of Greece in literature and sculpture, while remaining satisfied with the Roman buildings.

When Christian churches were allowed to be erected the type followed was the Roman basilica. But in course of time that type was modified under the influence of Byzantium. Signor MELANI does not attempt in his eagerness to make out his case to minimise that factor in the development of ecclesiastical art. Before as well as after the thousandth year of the Christian era the Byzantine spirit, he says, operated on all Italian work. It is seen in Lombard architecture. The Longobard DIDIER, afterwards known as Pope VICTOR III., brought a multitude of Greek artists to Monte Cassino, who, amidst the wreck of the old order, preserved the treasures of ancient literature by their copies of Classic authors and fixed a standard of art by their mosaics and *miniatura*. Ravenna and Venice are evidence of the fascination which the artists of Byzantium could exercise in Italy, although, of course, they were less powerful in more northern districts. But Signor MELANI insists that even in two such most characteristic works as St. Vitalis and St. Apollinaris it is possible to trace the plan of a Roman basilica. In Italy the Byzantine spirit was not blindly followed, rather it was acclimatised, and for that purpose it had to associate itself with local traditions and utilise the various local materials in construction. As regards St. Mark's, Venice, so little is known about the architects that M. BAYET conjectures they were Greeks, and according to M. CATTANEO, when Italo-Byzantine art arrived in the lagoons it found adversaries in the Greeks, and it required nearly a century before the new-comer partially triumphed by the fusion of the two styles. Further south, in Sicily, it seems to be manifest that such detail as appears at Monreale could only come from minds in which something of Greece still lingered.

Turning northwards, Signor MELANI is able to derive support for his theory from such catastrophes as the early invasions. The Longobards, he says, did not import any novelty in building, and were forced to employ Italian artists, the *Comacini* being numerous among them. The Lombards followed. The church of St. Ambrose, at Milan, founded in the ninth century, is a type of their architecture. Parts of course are fondly imagined to belong to a still earlier period, while Signor MELANI is doubtful whether the body of the building does not date from a later time than the ninth century. Whatever may be the period, in the Milan basilica, as in Lombardic churches in other parts of Italy, he sees local characteristics which suggest to him that the Lombardic style was not incompatible with an architecture that could be taken as belonging to Piedmont, Tuscany, Venice, Padua, &c. The degrees of assimilation varied. In St. Andrew, Vercelli, we find that the union of the two styles was not considered to be irregular as late as the thirteenth century. The building was erected by an English architect, DOMINIC BRIGHINTH or BRIGHINTZ. At Trent also the cathedral shows a similar experiment successfully carried out. In Tuscany, on the other hand, "the architecture of the Lombard period was unable to develop itself, for the conservative element there predominated, and was always attracted by classical antiquities." In Rome the Lombard style hardly gained a footing, but there are remains in the neighbouring Viterbo. Wherever found, it becomes evident that, whatever may be the value of Lombardic work as exemplifying style, it does not display any quality which is not racy of the soil of Italy. The originators were not great architects, and they seem to have improved in skill by absorbing whatever struck their fancies in local buildings.

In dealing with Italian Gothic, Signor MELANI has no easy task. The style cannot be said to have attained the perfection which seemed to be within command in France, Germany and England. But it is difficult to expect an Italian to underrate the importance of anything which exists in his own land. On the other hand, was Gothic an exotic, and therefore an exception to the theory which Signor MELANI expounds? The author frankly admits at starting, that owing to the character of the Italian climate, and the tendency of the people towards Classic art, it was impossible for Gothic to become fully developed in Italy. The cathedral of Milan was not commenced until 1386, but at that very time the Florentines were busy with the arrange-

* *Encyclopédie de l'Architecture et de la Construction.* Directeur P. Planat. Vol. V. Premier Fascicule. Paris: Dujardin et Cie.

ments for making their Duomo magnificent, that is to say, Classic, for GIOTTO, TADDEO GADDI and ORCAGNA set out in the course which BRUNELLESCHI followed. Gothic was introduced too late, and it was only in Piedmont, a frontier province, that it displayed any vitality. The style, too, was especially adapted to northern climates, and needed too many modifications before it was applicable in Italy. It was truly an exotic, and this was made apparent in the difficulties which attended the erection of the cathedral of Milan. The directors of the works were mainly foreigners, and, if they could have realised their desires, all the workmen would be foreigners also, for the masons and sculptors of the district were not familiar with the style, and in consequence it would be difficult to find another costly building having so much detail that is valueless, as being examples of labour that was joyless throughout.

In contrast with the treatment of the style in Milan may be placed the Venetian manner. Signor MELANI explains this by saying that Venetian Gothic is Oriental Gothic or Arab Gothic, although the work of Italians who had imbibed the Eastern spirit of the city, and that its peculiar character is to be traced to the ornamentation and the use of marbles rather than to a recognition of the principles of the style. Again, in Florence there is another variety to be seen in Sainte Maria del Fiore and GIOTTO's Campanile. But these cases also are exceptional; the style "is based upon a system of polychromy applied to decoration; it has a tendency to the horizontal rather than the vertical; much is sacrificed to produce a sort of tabernacle work, and an elaborate system of framing is used to emphasise the principal divisions decoratively." In Siena there was also independence of foreign precedents and rules. The history of the cathedral reveals that the people were indifferent to any fixed plan, and changed the arrangements according to circumstances; for, as is well known, the existing building was originally intended to be no more than a portion of the cathedral.

The Renaissance of the fifteenth and sixteenth centuries must have had a peculiar meaning for an Italian. He could only interpret the new movement as a sign that people in various parts of Europe suddenly had become worshippers of the ancient works produced by his countrymen in Rome or elsewhere in Italy. He knew of no higher standard, and could not understand how anybody cared to look beyond Italy towards Greece. To an Italian in that age Athens was little more than a dust-heap, and the remains were supposed to indicate a very small and poor Rome. Even when there was peace between Venice and the Turk, and the dangers of the journey were diminished, there were no scholars or artists forthcoming who were eager to gaze on the works of PHIDIAS or ICTINUS. Strong as was the passion for ancient works, it never led men beyond Rome.

It was therefore excusable if an Italian architect considered that whatever was best in his art was to be found in Rome, and that he was as justified in utilising the remains for suggestions as the scholars were when they derived inspiration from Classic literature. He was without any fear of an imputation of heresy when he rearranged the details of a building to suit his patron's convenience or his own, and saw no reason why he should not also create precedents. As Signor MELANI says, it was the ambition of PHILIPPE DE SER BRUNELLESCO LAPI to gain renown as the "rénovateur de l'architecture classique," and ALBERTI and MICHELOZZI had also a similar aspiration. But the spirit of the age in regard to innovators was seen in the history of one of BRUNELLESCO's works, the church of St. Lawrence in Florence. When he died the building was not completed. His successor, ANTOINE MANETTI, disregarded the plans and instructions left by the master, and followed his own notions of fitness in carrying out the final works. There was nothing fixed in those days, for old and new masters were treated alike.

Florence, Venice, Milan and Rome are taken by Signor MELANI as the cities where Renaissance architecture flourished. The architects of those districts, through prudence or principle, appear to have sacrificed occasionally some of their individuality for the sake of securing a local style; but it generally happens that the characteristics are associated with the artists, as is observed especially in the cases of BRAMANTE and PALLADIO. Even the baroque style which, as our author says, formed a connecting link between Palladianism and the free treatment of the seventeenth century, was only an effort to secure still more individual independence, especially in the use of ornamentation, than was possible when severe models were kept in view. MICHEL ANGELO must be classed among the exponents of the style.

In the next period still more license was claimed by BERNINI, BORROMINI and their followers, when stone seemed betwitched, for it was subservient to the most extravagant whims, and all the old rules of construction became obsolete. Everything became a sign of a personal feat in dexterity, and it is only in Venice Signor MELANI can discover the "influence du milieu" exercised as a restraining force over the artists.

Then there was a reaction, but not until nearly a century had elapsed. In the second part of the eighteenth century men were eager for definite codes of all kinds, and the old Vitruvian theories served for one in architecture. An impulse was also given to the study by the discoveries at Herculaneum and Pompeii, which revealed the beauty of an unexpected class of Italian work. The publication of PIRANESI's etchings of Roman buildings also helped to increase the power of antiquity. But the Italian nature is not to be manifested in faithful reproductions. The reformed architecture was, as Signor MELANI says, conventional, imitative and pedantic. A few good works were produced, such as GALLO's cupola for the church at Mondovi, and other structures at Cuneo, Fossano, Bene Vagienna. LOUIS CANINA was the best examplar of the style in Rome. But after all is allowed in favour of the return to ancient models there is no doubt Signor MELANI is correct when he says:—"Imitation at all times has been the most formidable of the enemies of art, and at the present time in Italy, through enthusiasm for the study of styles, we are daily found to be more distant from the true source of art—originality."

A few works merit to be distinguished from the countless showy mediocrities which represent modern architecture in Italian cities. The remarkable building known as the "Mole Antonelliana," which was designed for a synagogue, but remains in an incomplete state as a memorial of VICTOR EMMANUEL, deserves to be considered as a masterpiece which surprises the most intelligent constructor. The Victor Emmanuel gallery or arcade in Milan would be noticeable if size alone were considered. It has a length of about 650 feet, contains 1,260 chambers, and cost seven millions of francs.

There are many difficulties in the path of the successful architect in Italy. Finance counts for more than elsewhere, and financiers who are so often distinguished by the showiest of jewellery have a fancy that buildings which are to be profitable cannot be too obtrusive. A striking building is also supposed to be a sign of departure from old-fashioned ways. On the other hand, in no country is it easier for critics to find standards that will put all novelties to shame. The public insists on novelty, the judges decry it, an unlucky architect finds it hard to reconcile the two sets of ideas in his work. There is, too, an element of hopelessness in all things Italian, for few things realise the expectations of their creators, and where everybody is at heart a pessimist, the architect runs the risk of thinking that in the long run bad work serves as well as what is secure, thoughtful and refined. But these thoughts do not much affect the arguments of Signor MELANI. His countrymen in past ages cared more for designs which represented their own ways of thinking than for foreign work, although of superior quality. Whether it was wise to be so independent of the Greek mind is a question which cannot yield much profit to those who discuss it. The best Italian architecture, like the best Italian literature, was produced without regard for Greece, and there is no reason why excellent buildings should not be erected in Italy in which there is no trace of Neo-Grec. Signor MELANI has rightly grasped the character of his countrymen when he advises them to place a higher value on other things than accuracy in copying architecture.

The article is illustrated by a great many views of buildings that have been selected with care, and are executed in a manner that is suggestive of style. Altogether it may be said that Signor MELANI has infused new life into a subject on which it was supposed the final word was said long ago.

THE LINE OF FRONTAGE AND PRIVATE ACTS.

THE appeal in the case of the City and South London Railway Company *v.* the London County Council, before Lords Justices Lindley, Fry and Lopes, raised an important question, involving the right of the Electric Railway to keep its station at Newington in its present position, part of the building being erected beyond the general line of houses in Kennington Park Road. It was an appeal by the London County Council from a decision of a Divisional Court allowing an appeal from an order of a magistrate directing the demolition of part of the station. The City and South London Railway Company were empowered by their Acts of 1884 and 1887 to construct an electric railway from King William Street to Stockwell. Section 4 of the Act of 1887 provided as follows :—"Subject to the provisions of this Act, the company may make and maintain in the lines and according to the levels shown on the deposited plans and sections the subway hereinafter described, with all necessary approaches, tunnels, shafts, hydraulic lifts, buildings, works, machinery and conveniences connected therewith, and may enter upon and take and use such of the lands delineated on the deposited plans, and described in the deposited book of reference, as may be required for that purpose." By section 27 the company were required not to make any approach to the subway or any permanent tunnel, shaft, or other work, in such a manner as to interfere, after the completion thereof, with the carriage or footway of any street, nor to make more than two temporary shafts or openings in the surface of any street in the parish of St. Mary, Newington, without the consent of the Metropolitan Board of Works and of the vestry of the parish. The company acquired land at the corner of New Street and Kennington Park Road within the lines as shown on the plans, and constructed thereon two shafts, in one of which was a spiral staircase, and in the other hydraulic lifts affording access to the underground platforms. Over and adjacent to these shafts the company erected a station, part of which was erected beyond the general line of buildings, in contravention of the Metropolis Management Act, 1862. This part of the station contained the entrance-door, which opened on to the pavement of the Kennington Park Road, the booking offices, part of the waiting-room from which the lifts were entered, and another room. While the buildings were in course of erection the company were informed by the district surveyor that their buildings projected beyond the general line of buildings, and that unless the company obtained the consent of the London County Council to such erection they would be proceeding therewith at their own risk. The consent of the London County Council was never obtained. On June 27, 1890, the superintending architect of the London County Council, in pursuance of section 75 of the Metropolis Management Act, 1862, as amended by the Local Government Act, 1888, certified that the buildings of the railway company had been erected beyond the general line of buildings. If the company had acquired certain other lands, as they were entitled to do, adjoining those which they actually acquired, they could have erected a building equally convenient for the purposes of their undertaking within the building line. The magistrate found, as to the necessity and convenience for the company's said building, that a station building at the corner of New Street was necessary and convenient for railway purposes ; that the station building, without reference to the provisions of the Act of 1862 (25 and 26 Vict. c. 102, s. 75) was a reasonably convenient building ; that it was, however, not necessary for the purposes of the railway that any part of the station buildings should be erected beyond the general line of buildings ; and that it was convenient only in that the company saved expense by acquiring less land. The magistrate held that the company were not entitled to build as stated, and ordered the demolition of so much of the building as was beyond the general line of buildings in Kennington Park Road. The company appealed. The Divisional Court (consisting of Mr. Justice A. L. Smith and Mr. Justice Grantham) considered that the provision of the special Act which authorised the company to erect buildings necessary for their undertaking impliedly repealed the general Act, and they accordingly allowed the appeal. From this decision the London County Council appealed.

Lord Justice Lindley said that the question turned upon the joint effect of the Metropolis Management Act, 1862, and the City and South London Railway Act, 1887. The general Act which was first in point of date prohibited in general terms the erection of buildings beyond the building line of the street, except with the consent of the Metropolitan Board of Works, whose power had since been conferred upon the London County Council. The question was whether the special Act of 1887 had authorised the railway company to build a station in the way in which they had constructed it, some portion of it projecting beyond the building line. The view of the Divisional Court was that upon the true construction of the special Act it was impossible to read that Act so as to make it consistent with the general Act. The question turned upon the construction of section 4 of the special Act, and particularly upon the meaning of the word "necessary" and the expression "as may be required for that purpose" as used in that section. In his lordship's opinion the view of the Divisional Court was right. "Necessary" meant necessary for the undertaking without reference to the locality provided the buildings or other authorised works were within the lines shown on the deposited plans. The words "as may be required for that purpose" implied that the company were to be the judges of what they would require. The findings of the magistrate were important. He found, first, that it was necessary and convenient that a station should be erected at the corner of New Street, but he found further that it was not necessary for the purposes of the railway that any part of the station should be erected beyond the building line. Upon that finding the controversy arose. If the Court adopted the construction which his lordship had put on section 4, and were to accede to the contention of the appellants, that would be equivalent to telling the railway company that, though they had erected a building which was necessary for the purpose for which they were authorised to acquire land, it was nevertheless open to the County Council to dictate to them (the railway company) precisely where the building was to be and how it was to be erected. In his lordship's opinion, provided that the building was necessary for the undertaking, and was within the scheduled lands, it was no answer for the County Council to say that the building might have been erected quite as conveniently for the purpose of the undertaking somewhere else. The matter was made still plainer by certain limitations upon the powers of the railway company in the Act itself. The powers conferred by section 4 were declared to be subject to the provisions of the Act, and by section 27 the railway company were expressly prohibited from interfering with the street without the consent of the Board of Works ; but that section contained no prohibition as to projecting beyond the building line. The appellants had relied upon several cases, of which the Queen *v.* Wycombe Railway Company was the first ; but those cases turned upon the necessity of the thing to be constructed. The Court having found in this case that a station was necessary, there was no authority for compelling the company to build their station on any particular spot. The appeal failed.

Lord Justice Fry agreed. The special Act empowered the railway company to take and use such of the lands delineated on the deposited plans as might be required for the purpose of erecting a station, the magistrate having found that a station was necessary. These lands were partly within and partly without the building line in Kennington Park Road. It was obvious that section 4 was inconsistent with the general Act unless it were to be read subject to a proviso that nothing contained in that section should enable the company to build on land within the lines on the deposited plans unless it was also within the building line. His lordship did not think that the special Act ought to be so altered in order to make it consistent with the general Act.

Lord Justice Lopes concurred.

THE LONDON WATER SUPPLY.

THE Select Committee on the Metropolis Water Supply Bill met on Tuesday and agreed upon the terms of their report. The amended report led to considerable discussion. Mr. J. W. Lowther proposed the insertion of four new clauses —(*a*) dealing with the question of the adequacy in point of quality and quantity of the present supply, and the question of the sources from which an additional supply should be obtained; (*b*) recommending the appointment of a Royal Commission, composed of specially-qualified scientific members to consider how far, if at all, the supply at present derived from the Thames and Lea, and the springs and wells in the metropolitan water area, should be limited or extended ; (*c*) expressing the opinion that the complaint against the Chelsea and West Middlesex Companies respecting their agreements for additional intakes from the Thames have not been satisfactorily answered ; and (*d*) suggesting that local authorities within the metropolitan water area having their own independent rights should, in the event of purchase, be guaranteed in the exercise of their present rights. Of these all were rejected except the last (*d*), which was added to the report. The following is the text of the report as finally adopted and presented to the House :—

Your committee have proceeded upon the assumption that in the opinion of Parliament it is desirable to establish a single public representative water authority for the metropolis. The Royal Commission presided over by the Duke of Richmond reported in 1869 "that the future control of the water supply should be entrusted to a responsible public body, with powers conferred on them for purchase and extension of existing works, and for levying certain rates referred to." And the Select Committee of which Sir W. V. Harcourt was chairman, and

which examined into the provisional agreements for purchase contained in the Government Bill of 1880, reported "that it is expedient that the supply of water to the metropolis should be placed under the control of some public body, which shall represent the interests and command the confidence of the water consumers." Since these reports much valuable experience has been gained of the growth of population, and of the undertakings of the water companies and the demands upon them. Parliament also, since 1886, has adopted the policy of enforcing more stringent provisions in case of the issue of any fresh capital. An important inquiry into the whole matter, too, has recently been held by the Corporation of the City of London, and it is evident that there is much fresh light for the consideration of the question from every point of view. Your committee therefore consider it to be most desirable that the problem should be carefully and deliberately examined by the newly-constituted municipal authority, the London County Council, in the interests of the water consumers of the metropolis. The London County Council were, in the session of 1890, entrusted with powers to initiate negotiations with the water companies, and to incur certain limited expenditure in preliminary inquiries, but those inquiries are necessarily as yet incomplete. Your committee recommend :—

(i.) That powers should be granted to the London County Council to expend such further sums as may be reasonably necessary, in order that they may examine thoroughly for themselves, as the responsible municipal authority of London, the whole position of the metropolitan water supply, and come to a conclusion as to the policy which, for financial and other reasons, it is desirable to adopt.

(ii.) That, if they should so resolve, they should have power to promote a Bill or Bills in Parliament for the purpose of constituting themselves the responsible water authority for London, acting through a statutory committee, appointed either wholly by themselves or partly in conjunction with the Corporation of the City of London, as suggested to your committee on behalf of both bodies. Such statutory committee to comprise a certain number of members possessing special knowledge and qualifications, not necessarily members of the body or bodies appointing.

(iii.) That the London County Council, if constituted the water authority, should be required to purchase, either alone or in conjunction with such of the authorities of the outside areas as may be arranged, the undertakings of the eight water companies (except possibly certain lands of the New River Company) by agreement, or, failing agreement, by arbitration, within a fixed period.

(iv.) That, subject to any such arrangements, the new water authority should take over the duties and obligations which the present water companies now have towards the consumers of water in the districts outside the boundaries of the county of London, but within the limits of supply of the present companies.

(v.) That, in the event of purchase by the new authority, power should be given to that authority and to the authorities of the outside areas to negotiate for the purchase by the latter (i.) of so much of the works of distribution as is appropriated to the district of such local authority, and of the right to a supply of water in bulk from the new authority; or (ii.) possibly of some of the sources of supply which, with their works of distribution, it might be found practicable and advantageous to sever from the general scheme.

(vi.) That those local authorities which, like Croydon, Richmond and Tottenham, are situated within the metropolitan water area, but have their own independent water-supply, should, in the event of the purchase of the water companies by the new water authority, be guaranteed in the exercise of their present rights.

In the event of the undertakings of the companies not being acquired by purchase, the committee recommend that there should be a Parliamentary inquiry, before which the interests of the whole of the consumers within the area of the present metropolitan water supply ought to be represented, into the statutory powers and obligations of the water companies, and the control which is now exercised by public departments and the metropolitan and other authorities over them. In the appendix to the minutes of evidence will be found a memorandum setting out the existing conditions, but it might possibly be found advantageous to make the obligations and the control more complete.

Your committee found it impossible, within the limits of the time at their disposal, to conduct satisfactorily any examination into the quality and quantity of the London water supply. But, apart from that consideration, they are of opinion that these questions will naturally form a part of the complete inquiry which it will be the duty of the London County Council to conduct, with the assistance of the professional advice which, as your committee have recommended, should be at their disposal.

Although your committee have not been able, for the same reason, to examine into any of the cases sought to be established before them by the various local authorities of the areas in which are contained the present sources of supply, for the protection of their separate interests, your committee have received sufficient indication that there exist complaints, founded or unfounded, that those sources are in some quarters being even already overtaxed. Your committee do not see their way to recommending any practicable method for the effective association of any of these authorities with the inquiry, for which the London County Council must be responsible. But they are of opinion that in any such inquiry regard must be had, on the one hand, to the statutory rights of the present water companies, and, on the other, to the legitimate wants and necessities of the inhabitants of those areas. It must remain with Parliament ultimately to decide upon the merits of any scheme submitted.

In view of the possibility of its being ultimately established that the present sources of supply cannot be extended and that additional sources of supply are required, and as the possible fresh areas of supply are limited and are already being drained for other large communities, your committee think that Parliament may well consider, before granting any powers for further encroachment upon those areas, how far provision ought fairly to be made for the possible requirements alike of the metropolis and of the other large populations upon the lines of supply.

Of the two Bills before your committee for the constitution of a new water authority, neither appears to them calculated to effect a satisfactory solution of the problem, but your committee desire to place upon record their opinion that both those Bills were promoted in the public interest and to considerable public advantage.

KIRKSTALL ABBEY.

THE historic ruin on the banks of the turbid Aire at Kirkstall, which Colonel North, with conspicuous generosity, presented to the town of Leeds, is now, as our readers are aware, says the *Leeds Mercury*, being rescued from the ravages of time. Thus, under the care of its new custodians, it will continue to tell its story of the dim but interesting past to future generations of the inhabitants, and, indeed, to all who come from near or far to gratify their love of the antique. In the work that is going on, under the supervision of Mr. Micklethwaite, of Westminster, architect and antiquary, no attempt at restoration is being, or will be, made. The slow, but sure, demolition by the ruthless hand of Time, which the former possessors of the picturesque pile had unhappily allowed to proceed too far, is simply being arrested. The portions on the point of falling are receiving the strength they needed by the application of fresh mortar; something is being done to preserve the remaining traces of the walls whose superstructure is gone; the mere *débris* is being cleared away; and well-directed efforts are being made generally to achieve the desirable object, while care is taken to avoid, as far as practicable, anything which would rob the ruin of its hoary grandeur. On Saturday afternoon a number of the members of the Thoresby Society, with their friends, visited the Abbey, with the twofold object of seeing the work of preservation now going on and of listening to Mr. Micklethwaite, while, as the spokesman of the eloquent ruins, he told of the builders of the Abbey, pointed out the peculiarities of their handiwork, and, by a graphic description, filled in the gaps, making for the imagination of his auditors a perfect whole. Much that was of interest he said regarding the daily routine of both the clerical and lay brethren, their religious services, the observance of the rules of the order, and the life generally of the pious Cistercians, who were the Puritans of the Catholic Church in Mediæval times. The idea of the original orders of monks was that to live in the service of Heaven they must spend their time at their devotions. The Cistercians, who built Kirkstall Abbey, however, took the view that the work of man's hands is also an acceptable service, and they therefore provided a place for those who could not read but who could labour. In the twelfth century very few men in Western Europe, excepting those educated for the clerical life, could read, and many of the untaught were imbued with the desire to follow the monastic life just as much as were the clerics. The Cistercians started a second order called the lay brethren, who were as truly monks as the others, though they worked in the fields for the common good and only spent a portion of their time in the church. The buildings of the Cistercian order, like their services, were as plain as they could possibly be made. The earlier abbeys erected by them were, said Mr. Micklethwaite, as bare as a coal-cellar, though they were of stately dimensions and exceedingly well built. Kirkstall was one of their later buildings. All this, and much more regarding the Cistercian order, was probably known to most of the gathering, but nevertheless the party must have been grateful for the address. What was no doubt of greater interest was the description of the various buildings, and the purposes to which they were devoted, by a guide who seemed to know every stone, and whose thorough acquaintance with all that pertains to the subject proclaimed

his devotion to this department of antiquarian research. There is one drawback in visiting Kirkstall Abbey. The pleasure of exploring it is sadly marred by the sight of the black, foul river in the immediate vicinity. What a change is there since the days when the monks supplied their table with trout caught in the stream!

TESSERÆ.

The First English School of Design.

THE Society of Arts, or, to give it its full and more suggestive style, the Society for the Encouragement of Arts, Manufactures and Commerce, was instituted in London in 1754, and incorporated by Royal Charter in 1847. The credit of having proposed the formation of this important Society, which has been of inestimable practical value in the precise directions indicated by its title, is due to a landscape-painter named William Shipley (brother of the then Bishop of St. Asaph), who in 1753 suggested its establishment, and a school of design was one of its first offshoots. Mr. Shipley himself superintended it, and Richard Cosway, the celebrated miniature-painter, received the first premium of 5*l.* at the age of fourteen. This school of design was the result of a meeting of noblemen and gentlemen, clergymen and merchants, held at Rawthmell's Coffee-house, Henrietta Street, Covent Garden, on March 22, 1754, when it was proposed, amongst other matters, to give rewards for the best pieces of drawing, "and it being the opinion of all present that the art of drawing is absolutely necessary in many employments, trades and manufactures, and that the encouragement thereof may prove of great utility to the public, it was resolved to bestow premiums on a certain number of boys and girls under the age of sixteen who shall produce the best pieces of drawing and show themselves most capable when properly examined." We learn from a note appended by Burnet to the earliest of Sir Joshua Reynolds's Discourses that there were present at this meeting Viscount Folkestone, Lord Romney, Dr. Hales, Mr. Goodchild, Mr. Lawrence, Mr. Messiter, Mr. Crisp, Mr. Baker, Mr. Brander and Mr. Shipley, who acted as secretary. At their next meeting, in the following week, an advertisement was drawn up offering their first premiums, viz. "for the best drawings by boys and girls under the age of fourteen years, and proof of their abilities on the 15th day of January, 1755, 15*l.*, to be determined that day fortnight; likewise for the best drawings by boys and girls between the age of fourteen and seventeen, with like proof of their abilities on the same day, 15*l.*, to be determined that day fortnight." Nor did the Society confine their premiums to youthful candidates only, but extended their patronage to historical paintings, landscape, sculpture and architecture, without limitation as to the age of the candidates, and in the space of twenty years expended the sum of 7,926*l.* 5*s.*, besides ten medals of gold and six of silver, seventeen gold palettes and eighty-four of silver.

Bricks with Designs in Relief.

During the excavations for the St. Katherine's Docks in 1831 six ancient bricks with designs in bas-relief were met with. The subject of the first was the Annunciation of the Blessed Virgin; of the second, the Nativity of our Saviour; the third appeared by the lion to be a representation of the Evangelist St. Mark; the fourth bore the figure of St. John, the eagle holding his inkhorn. Both the Evangelists were delineated in the act of writing their respective gospels. The design of the fifth brick was not scriptural, but intended for a representation of some naval combat celebrated in Roman history, as may be inferred from the costume of the figures, probably the battle of Actium. In the prow of one of the vessels (in a similar taste to many other examples of historical designs in the Middle Age) an anachronism was observable in the appropriation of offensive weapons—a Roman soldier was represented in the act of discharging a hand-gun. The sixth brick was impressed with a head, bold in its lineaments and wearing an over-arched crown, and on either side two dolphins connected with ornamental scrollwork. The bricks were all of the same dimensions and evidently of the same period, that is, about the beginning of the sixteenth century, or it may be a little earlier. Stamped bricks of this kind and age are articles of considerable rarity, and the antiquaries of the last century appear to have been much in error with respect to their makers. In Bagford's letter, appended to the editor's introduction to the later edition of Leland's "Collectanea," a stamped brick is noticed which was found in Mark Lane in 1670, about 28 feet below the level of the street, impressed with the story of Samson destroying the standing corn of the Philistines by attaching firebrands to the tails of foxes. Bagford was disposed to consider this brick Roman, and from the circumstance of some parched corn having been found at the same time near the spot that it had formed the key-brick of a vaulted granary erected in the Roman times. The very plain fact that the bas-relief on the brick represented the Scripture story stood much in the way of this opinion. An antiquary's conjecture is not, however, easily defeated, and Bagford got rid of the improbability that the Pagan Romans should represent the deeds of Samson on a brick by the suggestion that some Jews might wander into Britain, settle there under the Roman emperors, erect a granary in a Roman mercatorium, or mart, in Mart Lane, since, he supposes by corruption, called Mark Lane, and thus it happened that Samson's stratagem against the enemy of the chosen people was represented on a brick of the Roman age. By a communication inserted in the first volume of the "Archæologia" it appears that this brick was still at a later date considered to be Roman, but Dr. Tovey, the author of that paper, feeling dissatisfied with the manner in which the subject of its bas-relief had been explained by Bagford, referred it to a story in the "Fasti" of Ovid, to which, by several evident discrepancies, it had no real relation. The brick, engraved by Bagford, in form, dimensions and character corresponded exactly with those found at St. Katherine's Docks, as may be ascertained by a comparison with the print in the introduction to Leland's "Collectanea." This brick, and the burnt corn found with it, probably came from the ruins of some old house which had existed in Mark Lane before the fire of London. Considerable light was afterwards thrown on the age of Bagford's brick by the discovery of another of the same kind in the year 1808 in an old well at Gravesend, on which was impressed the story of the conversion of St. Hubert. Mr. Cruden, of Gravesend, published a small octavo pamphlet on the subject of that discovery and of stamped bricks in general, and plainly demonstrated that they could be no older than the period of Henry VIII. or the early part of the reign of Henry VII. From the external appearance of the six stamped bricks from St. Katherine's it was inferred that they were employed to decorate fireplaces before the introduction of the coloured and glazed Dutch tiles used for that purpose, and Mr. Cruden in his pamphlet makes the same conjecture.

Republican Rome.

The most densely inhabited areas of the city were the Suburra, between the Quirinal and the Esquiline, and the Velabrum, which descended from the Capitol and the Forum to the river side. While the hills were occupied by mansions of stone, surrounded frequently by courts and gardens, or connected one with another by colonnades, the lower levels of Rome were thronged with buildings sometimes of burnt, sometimes of unburnt brick, often merely of wood, constructed in lofty blocks of many houses each, which the law was constantly engaged in the vain endeavour to keep at a certain fixed distance from one another, to check the progress of the frequent fires. The houses indeed of the nobles were frequently encompassed by small huts, leaning against their outer walls, for the accommodation of their slaves and retainers; and to this extent the lower classes may have established themselves from an early date even on the Palatine; but it may be doubted whether the principal hills were traversed at all by streets, and whether they were accessible, except perhaps at a single point, for wheel carriages. The streets below were numerous, tortuous, and narrow. It is doubtful whether the houses, rising often to many storeys, were built with projecting upper works; generally there could have been no room in such close-thronged rows of buildings for any projection at all. We need hardly add that these wretched avenues were neither paved nor lighted; and when a distinguished warrior was rewarded with the special permission to ride home, when he supped abroad, on the back of an elephant, the honour must have been as embarrassing to himself as formidable to his fellow-citizens. The view of Rome from any of the elevated points within it or about it must have been singular to our notions, from the total absence of towers, spires and minarets, such as are equally conspicuous in the architecture of London and Paris, of Moscow and Kasan, of Constantinople and Cairo. The stranger who seeks to obtain a general idea of the features of the hallowed site at the present day climbs the lofty stair of the tower of the Senator's palace at the most central eminence; but there are innumerable churches from the domes of which a wide-extended view may be commanded of the city and the country around. Ancient Rome, till at least a very late period, had no such specular turrets. Even the columns of Antonine and Trajan rise from very low levels and barely overtop the heights around them. The Tower of Mæcenas, which stood on the loftiest site of the Augustan city, was probably but little raised above the noble mansions of the Esquiline quarter. To gain a general view of Rome, Martial as we have seen, directs us to the terraces of a garden on the opposite slope of the Janiculan. But every hill was crowned with the pointed apex of some conspicuous temple, and by such temples, indeed, rising above the general line of the housetop the horizon was almost everywhere bounded. And these, too, were surmounted by the statues of the gods, perched upon the highest pinnacles. The Roman as he walked in the streets, at least wherever an open space allowed his eye to range to the eminences around him, beheld the countenances of his country

gods bent down upon him from every side. The vision of the avenging deities of Greece, which Venus reveals to Æneas upon the walls of Troy, may have been suggested by the familiar spectacle of the divinities of Rome thus raised aloft, each on his own peculiar hill, to watch over the fortunes of the favourites of Olympus. After the conflagration of the city by the Gauls, it had been rebuilt, we are told, without any plan, and with no improvement in the style of its ordinary architecture. Every one ran up a house himself where he would, or built upon the roof of his neighbour; and so little were even the old lines of the streets regarded, that they were now frequently made to cross the sewers which had been formerly constructed to drain them. An old law had limited the thickness of the walls to one and a half feet in order to economise space; but when, with the increase of the population, and the expansion of the private dwellings of the rich, the precincts of the temples and the places of public meeting, it became necessary to raise storey upon storey, these foundations were not sufficiently strong to support the incumbent mass. The constant falling of houses is mentioned, along with the conflagrations and the inundations of the river, as one of the great dangers and inconveniences of city life. Things, however, grew worse and worse towards the decline of the Republic. The competitors for public favour expended their resources in erecting vast theatres, and contributing to the amusement of the voting multitude; but their tenure of office was too brief, their interest in the well-being of the masses too factitious, to allow them to devise wise and large schemes of metropolitan improvement.

The Dresden Gallery.

This gallery may be said to have been founded as early as the middle of the sixteenth century by the Elector Augustus I., who collected pictures by Cranach, Albert Dürer and other early German painters. It was enlarged by his successors, who brought together paintings scattered in royal residences, churches and public buildings, and purchased various specimens of the Italian and other schools. But it was the Elector Augustus III. (1733-63) and his Minister, Count Brühl, who acquired for the Dresden Gallery those treasures which have raised it to the first rank amongst the galleries of Europe. The Duke of Este Modena, being in want of money, like many other Italian princes both then and since, offered for sale the noble collection of pictures inherited from his ancestors. Negotiations were carried on through the agents of the Saxon Government with the greatest secrecy, in the dread of an attempt on the part of the people to oppose by open violence what they considered an alienation of national property. The intrigues and artifices devised by the Duke's Minister to outwit and cheat his German rival were worthy of the best period of Italian diplomacy. The price was, after prolonged wrangling, fixed at 100,000 golden sequins; but the Minister insisted upon a bribe of 100 sequins for himself, then exacted 8,000 more by sundry ingenious tricks, and triumphantly concluded the negotiations by robbing the Saxon of the gilded frames. The collection contained six pictures by Correggio, including the celebrated *Notte* and the *Magdalen*, Titian's *Christo della Moneta*, and Holbein's superb portrait of Thomas Morrett, goldsmith to Henry VIII., then believed to be that of Ludovico Sforza, surnamed "Il Moro," by Leonardo da Vinci; a remarkable instance of the uncertainty of picture nomenclature, as well as a signal tribute to the genius of the German painter. The next important addition to the gallery was the exquisite picture of the *Holy Family* by the same great master, which had passed from the possession of the descendant of the wealthy burgomaster, Jacob Meyer of Basle, for whom it was painted, into that of the Delfino family of Venice. The learned Algarotti, the friend and correspondent of half the royal literati of Europe, acted for the Elector, and the painter Tiepolo was the go-between. A thousand golden sequins was fixed as the price of the picture, but various conditions were insisted upon by the owners not unlike those attached to the sale of our own Paul Veronese by Count Pisani, and much cavilled at by hasty critics not acquainted with the manner of "doing business" in Italy. Signor Tiepolo was to receive "a present in silver plate and chocolate, and a cane with an amber head mounted in gold, worth fifty sequins," whilst 462 livres were to be divided between the major-duomo and other servants of the Delfino family. Ten years later the gallery acquired its greatest treasure—the *Madonna di St. Sisto*, by Raphael—which, for the union of the highest qualities of execution with the loftiest and tenderest sentiment, and the most exquisite beauty combined with dignity and majesty of expression and of form, is probably the most perfect picture that the art has produced. It was painted, as Vasari tells us, for the high altar of the church of St. Sisto at Piacenza. Tradition records that the painter, revolving in his mind during a sleepless night the treatment of his picture, suddenly beheld at the foot of his bed an apparition of the Virgin accompanied by St. Sixtus and St. Barbara, whilst two beautiful angels, leaning on the foot of his couch, gazed upon the divine vision. The looped curtains enclosed the heavenly picture. The enchanted painter seized the subject thus revealed to him, and produced his matchless work. The negotiations for the purchase were carried on with great secrecy through a Bolognese painter named Giovannini, and 20,000 ducats, about 10,000*l*., an enormous sum for those days, but certainly not too great for a priceless work, was finally accepted by the convent. The Dresden Gallery thus became possessed of the two masterpieces of the Italian and German schools. The Saxon Government have since employed agents, amongst whom at one time was Raphael Mengs, to treat for some of the most remarkable pictures in Europe, but no very important additions have been made to the gallery, which contains a large number of works of inferior merit, and is deficient in examples of painters of the early schools.

Ancient Gem Engravers.

Theodorus of Samos, about 540 B.C., is the earliest recorded. He engraved the celebrated emerald signet of Polycrates. Schiller has embodied a curious legend relative to this signet in a beautiful poem entitled "Der Ring des Polycrates." In the time of Alexander great progress had been made in this art, and many celebrated names belong to this period, among whom Pergoteles is pre-eminent, who alone was permitted the distinction of engraving the portrait of that great monarch, fortunate in possessing also the talent of Apelles and Lysippus. Between the eras of Alexander and Augustus flourished in Magna Grecia many excellent artists. Polycletes and Tryphon belong to this period. The time of Augustus beheld the perfection of the art. Dioscorides, Alexa, Aulus, Gneius, and many others of lesser celebrity, but principally of Greek extraction, lent their talents to the luxury of Rome. Ælius, Alpheus and Arethon maintained its reputation during the reigns of Tiberius and Caligula. Evodus, Nicander, Anteros and Hellen occupied the period from Titus to Hadrian, and Æpolianus belongs to the era of Marcus Aurelius. There are, besides, many artists whose chronological position is uncertain, among whom we may name Ætion, Agathemeros, Emon, Gaios, Glycon, Hyllos and others, all of whom were Greeks, practising under the Roman empire. The first development of the art in modern times took place under the fostering patronage of the Florentine family of the Medici, who gave great encouragement to this branch of the fine arts, and some of the works produced during the fifteenth century challenge comparison with the finest antiques, and the taste for collecting cameos was common among the princes of Italy. After a considerable decline, gem engraving again in the seventeenth century engaged the attention of artists and men of taste, and many fine works, both in Italy and Germany, were the result of this increased consideration bestowed upon it.

Laminated Beams.

The roof of the Leeds Town Hall, designed by Mr. Cuthbert Broderick, is noticeable for the absence of tie-beams, which allows of the ceiling of the hall being brought nearer to the exterior of the roof than is usually the case. The roof consists of eight sets of principals framed together. Each principal consists of a semicircular laminated rib, formed of twelve 1½-inch planks, 9 inches wide, nailed together and fastened with wrought-iron bolts and straps. They are placed in couples, and stand immediately over each of the columns in the hall. They are respectively 4 feet and 18 feet apart. The width of the room is 71 feet, and the springing of the ribs 53 feet from the ground. The entire height to the top of the roof is 99 feet, the hall being 73 feet high in the clear. This system of roof has been adopted more frequently in France than in England. The laminated rib is the invention of a French engineer. It was at first suggested for a bridge over the Rhine in the year 1811. Several years later M. Emy constructed several roofs on this plan, but all his roofs, being very near to the ground at their springing and without ceilings, are consequently much more manageable than the roof of the town hall, which has a very elaborate plaster ceiling attached to it, and the springing is at a considerable distance from the ground. Precaution had to be taken to insert several additional struts and braces as a preventive against any change of form or outward thrust. Both these points had been attended with the most complete success, there being not the least perceptible outward thrust or change of form. The latter fact was proved very satisfactorily by the plasterers, who were enabled to run the mouldings on the ceiling from the centre. The brackets for these mouldings were not gauged from a centre, but fastened to the ribs according to their sizes. If the principle of these laminated ribs were better understood, it is possible that many of our architects would adopt it instead of depending on three or four overstrained joints for one tie.

At Small Heath, Birmingham, a new Baptist chapel has been opened. The building was erected by Mr. T. Johnson, Nechells, to the designs of Messrs. Ingall & Son.

NOTES AND COMMENTS.

THERE is no city in Europe that can display so many reports about water as London, and yet the inhabitants seem to be as far as ever from obtaining an adequate supply. Nobody will be surprised at finding the latest Parliamentary committee proposing a fresh inquiry. It is a simple way out of a difficulty, especially when the holiday season is upon us. But do any of the members who prepared the report anticipate that the London County Council can make discoveries which have not been described in blue-books many a time and oft? The members of the County Council are already overburthened with business. If they will take up the inquiry there will be no lack of engineers and projectors forthcoming, their evidence will be reported at the utmost length at the cost of the ratepayers, plans will be lithographed, analysts will be employed, clerks of water companies will make protests, there will be discussions about the right of certain parties to appear, and the limits of the powers of the Council will be repeatedly defined. But, however involved may be the proceedings, they will simply result in demonstrating once more that there are few gathering grounds available, and that the use of any of them involves some risk. Having arrived at that end, there will be a short respite from the announcement of new schemes. The evil of these inquiries is that they make people imagine it is possible to obtain the best advice gratuitously. If the Council are serious in desiring control over the water-supply of the metropolis, the readiest and most economical way would be to seek reports from the most skilled hydraulic engineers in Westminster and pay an adequate price for the information. It will be much easier to consider half a dozen elaborate reports from experts than an indefinite number from the class of men who are likely to be heard at the inquiry.

THE French Commission of Historic Monuments has agreed to the application of the New York Society of Arts for permission to take a cast of the relief by RUDE on the Arc de l'Etoile, Paris, and which is known as *The Marseillaise* and as *The Departure of the Volunteers*. It surpasses the rest of the sculpture on the arch, and seems to be an embodiment of the revolutionary spirit which enabled France to assert itself against the rest of Europe. Nor is it necessary to be a revolutionist in order to appreciate it. The vigour seen in the group of men of various ages and in the youth who accompanies them, as well as the strange expression of the Bellona that hovers above them, elevate the work beyond political and social circumstances. The Americans have acted wisely in appreciating RUDE'S great production, which is worthy of a place beside the best work of all ages and nations. The cast will cost 40,000 francs. As it is the first time such a reproduction was undertaken, the French Government have ordered that another cast is to be taken for the Trocadéro Museum. It is possible the cast will be shown at the Chicago Exhibition with copies of other masterpieces of sculpture.

IF beauty of scenery can count for anything with archæologists, there is no doubt the members of the Royal Society of Antiquaries of Ireland will be able to carry all before them this year, for what other society, archæological, artistic or utilitarian, can discover such a place for meeting as Killarney presents? Shrewd Welshmen admit the supremacy of the Irish lake district, for the members of the Cambrian Archæological Association have wisely resolved to unite their stock of lore with that of the Irishmen, and to form a joint meeting of a kind that is unprecedented. In Fairyland there could be no more attractive excursions than await the members and their friends. On the first day, that is, August 11, Lord KENMARE'S demesne will be passed through to visit Ross Castle, Innisfallen and Muckross Abbey. Next day there will be an excursion to Aghadoe, and, it is said, "such as may desire can go on through the Gap of Dunloe and return by boats down the lake." Breathes there a man among the newest or oldest school of archæologists who can approach the scene and yet be free from such a desire? If one could be discovered, there are eagles enough left to render him a little justice. But Killarney, after all, forms only one item in the programme. The third day's excursion will be to Dingle, and there is plenty to be seen on the way, besides the Oghams at Ballintaggart. From Dingle there will be visits to Gallerus, Temple Gael, Kilmalkedar, St. Brendan's Oratory, &c., names which by themselves can excite interest. The stranger will find himself in a district where every step associates him with the legends of the dawn of Christianity in Ireland. To this remote region came bands of unknown solitaries, who found spiritual delight in the wild landscape, where there were only rocks and streams, sky and waves to be admired. Examples of the beehive houses, which were the scenes of many fierce mental conflicts, are still preserved, and are enough to give interest to any district. Some of these recluses, in their longing to be solitary, made voyages in frail skiffs of hide, and, according to the legends, saw the Atlantis of PLATO, the island to which some of the outcasts from Paradise were driven, and many other strange things rising from the waves of the Atlantic. St. BRENDAN was the most courageous of all, and the story of his adventures wiled away winter nights in many a Mediæval monastery. One of H.M. gunboats and a steam vessel will be available for members who desire to follow a part of the course of the primitive seekers after the unknown; but the character of the place is suggested by the official notice that, "owing to the precipitous nature of the Skellig rocks, the heavy swell of the Atlantic, and the absence of a landing-stage, the party will have to disembark in the ship's boats—a slow process, and one not to be attempted if the weather is at all rough." Archæologists who are not heroically adventurous will find provision has been made for them. After enjoying Killarney, they can follow another course that is safe as it is beautiful. A railway journey of three hours will bring them to Kilmallock, the Irish Baalbec, where there is much that can be called unique. Limerick comes next, and with it the Shannon, which leads to so much that is fascinating for eye and mind.

THE sixth section of the National Congress of Hygiene and Demography, which is to open on August 10, will be under the presidency of Sir A. W. BLOMFIELD, A.R.A. The subject of open spaces will be discussed by the Earl of MEATH; hygienic principles for the extension and internal improvement of towns by Herr STÜBBEN, city architect of Cologne; the control of the construction of buildings by Mr. BLASHILL, superintending architect to the London County Council. M. TRELAT will read a paper on the hygienic composition of walls; Messrs. LENNOX BROWNE and ERNEST TURNER on the sanitation of theatres; and Dr. THORNE THORNE on English isolation hospitals. Sir JOHN COODE will preside over section 7, that of engineering in relation to hygiene. Among the subjects to be considered will be sewage-disposal and water-supply, the drainage and irrigation of land in relation to health, and the destruction of refuse. Professors ROBINSON and PACCHIOTTI, Mr. BALDWIN LATHAM, Dr. CARPENTER and Dr. FRANKLAND will be among the speakers.

MEUDON is a favourite resort of Parisians on summer Sundays. Few of them, however, take much notice of a little house in the Rue des Pierres bearing marks of antiquity which has just been classed among the historic monuments of France, and is one of the smallest among them. This house was purchased on May 30, 1676, by ARMANDE BEGART, the actress, who was the wife of MOLIÈRE, and the cause of much of his unhappiness. It may be assumed that she made it the best-furnished house in Meudon. MOLIÈRE, by his appointment in the King's household, was connected with contractors for tapestries and furniture. As a theatrical manager, he was also interested in furniture. His own collection was sumptuous, and it was the property of his widow when she became owner of the Meudon cottage. Some looking-glasses that are fixtures are the only relics remaining in the house. The Maison d'Armande was found to be an obstacle to some public improvements, and accordingly a decree went forth for its demolition; but, in spite of the local authorities, the house is to be saved. After a long struggle it has been decided to include the building among the great cathedrals and other monuments which are the care of the State. The house will become more remarkable than ever, as its irregularity will be in contrast with the new buildings in which straight lines are predominant.



The Architect, July 17th 1891.

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KINMEL PARK, ABERGELE.—GARDEN FRONT.
THE SEAT OF H. R. HUGHES, ESQ.

KINMEL PARK, ABERGELE. ENTRANCE AND GATES.

THE SEAT OF H. R. HUGHES, ESQ.



KINMEL PARK, ABERGELE. ENTRANCE FRONT

THE SEAT OF H. R. HUGHES, ESQ

The late W. EDEN NESFIELD, Architect.

The Architect, July 17th 1891.



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KINMEL PARK, ABERGELE.—BALL ROOM, EAST END.

THE SEAT OF H. R. HUGHES, ESQ.

The late W. EDEN NESFIELD, Architect.

The Architect, July 17th 1891.



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DESIGN FOR FAÇADE OF CHURCH OF THE HOLY TRINITY, CORK.

By ARTHUR HILL, F.R.I.B.A., Architect.

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NOS. 384–387.—KINMEL PARK, ABERGELE. [THE LATE W. EDEN NESFIELD.]

FOUNTAINS HALL.

DESIGN FOR FACADE OF CHURCH OF THE HOLY TRINITY, CORK.

[The illustration of Entrance for Proposed Brewery Tap published last week shows premises of the New London Brewery Company, Limited. The architect is Mr. W. M. Brutton, 1 Catherine Street, Strand, W.C.]

THE FUNDS OF WESTMINSTER ABBEY.

THE following is a statement furnished by Dean Bradley as to the principal sources from which the funds have been drawn for the building, enlargement and maintenance of the fabric of the Abbey in early and recent times. It will be understood that up to the period of the dissolution of the monastery the word "abbey," when applied to the fabric, included not merely the church, but the whole of the monastic buildings of which it formed a part.

The history of the Abbey falls naturally into two periods. The first extends from the completion of the Abbey church of Edward the Confessor in December 1065 to the dissolution of the monastery under Henry VIII. in 1540. The second, from the grant of the charter of Queen Elizabeth in 1560, and the establishment of the collegiate body of deans and canons, &c., to the present time. The great changes which have taken place at a recent date will be briefly noticed.

During the first of these periods, a time covering nearly five centuries, the erection and enlargement of the Abbey church was mainly, though not entirely, the work of successive kings. The same was true as regards the first erection of the older monastic buildings. It will be remembered that the earlier of the two great Abbey churches, viz. that completed in December 1065, a few days before the death of Edward the Confessor, was entirely the work of that king; that the monastery and the church were both erected by him in close proximity to his palace, and that both were equally essential to the object which their founder had in view, viz. the erection of a burial-place for himself, and the endowment of a body of monks who, in addition to their other duties, should perform masses and offer prayers for his soul. Hence the twofold character of the Abbey church, which was at once a royal chapel and a monastic chapel; the chapel of a palace and the church attached to a Benedictine monastery.

The connection between the church and the adjacent palace was so far from being severed by the Norman Conquest, which followed within a few months of the Confessor's death, that it became closer, it may be said, with every reign, and was the source of unusual privileges and large grants of land and other sources of revenue to the abbots and the "conventual" body of Benedictine monks over which they presided.

The most conspicuous of royal builders were, it is hardly necessary to say, Edward the Confessor, Henry III. and Henry VII.; but the work of construction, both of the church itself and of the adjoining buildings, especially of the former, was carried on with much aid from many of their successors, among whom Edward I., Edward III., Richard II., Henry V. and Edward IV. were actually the most prominent. But there were few sovereigns who did not contribute in some measure to a building connected with English royalty by ties that grew stronger with every generation. It will be remembered that the work of Henry III. was limited to the eastern part of the existing church, viz. its centre and all eastward, the two transepts and a very small portion of the nave. The erection of the remaining portion of the latter was carried under his successors down to the time of Henry VII. The western front was not actually completed in its present form till 1741, about five centuries after the commencement of the work by Henry III. Even during the wars with France the completion of the western portion of the nave was aided by an annual grant from Henry V. of 1,000 marks, one moiety from the "Hanaper" office dues, the other from the duties on wool, hides, &c. Treasurers or, as we should say, commissioners were appointed for the prosecution of the work.

In addition to aid from kings, much of the constructive work was due to active and influential abbots. Not a few of these held high and lucrative offices of State, and in addition to special manors and estates assigned to their use had access to various modes of increasing the resources at their disposal, such as the obtaining the "impropriation" of the tithes of parishes on their property, a fruitful source of supply both to monasteries and to the founders and benefactors of colleges at Oxford and Cambridge, and the offering of spiritual benefits, such as masses and indulgences, to individual contributors.

The original lady chapel, afterwards replaced by that of Henry VII., attached to the east end of the fabric of Edward the Confessor, was mainly the work of two abbots, William Humez and Richard Berking. There is evidence that they obtained contributions from individuals in the manner mentioned above. It may have been the example and influence of Abbot Berking which suggested to Henry III., who, as a boy king of less than thirteen years old, had laid the foundation-stone of the new lady chapel the day before his own coronation at Westminster, on Whitsunday 1220, the great work of building the present Abbey, which he commenced in 1245 and completed, with the exception of the nave, in 1269.

In the fourteenth century Simon Langham did much as abbot (from 1349-61) for the fabric of the Abbey. He held, among other offices, those of Treasurer and Chancellor to Edward III., and in 1361 became Bishop of Ely, and Archbishop of Canterbury in 1366. He vacated the Archbishopric on becoming a cardinal in 1368, and died at Avignon as Cardinal and Bishop of Præneste in 1376. He was buried, as ordered in his will, first in a Carthusian church near Avignon, and after three years in St. Benedict's Chapel in the south ambulatory, the only Archbishop of Canterbury buried in the Abbey. By his will, drawn up at Avignon, June 28, 1375, he bequeathed the whole residue of his great wealth, after payment of certain legacies, to the fabric of the Abbey, using the word in its widest sense. There is evidence that he was exceedingly anxious for the completion of the nave westward, and had contributed largely to the funds required for the work; but the wording of his will is quite general. "Omnia alia bona mea quæcunque et qualiacunque ubicunque reperta fuerint lego fabricæ monasterii Westmonasterii predicti [*i.e.* prope Londoniam in Anglia]." The total amount of his benefactions to the Abbey in his lifetime and by his will were said to amount to 10,800*l.*, representing, it need hardly be said, a sum many times that amount in the currency of the present day. The great treasures thus disposed of were largely employed by his successor, Nicolas Litlington, whom he named first among his executors (abbot, 1362–86), in the completion of the south and west cloisters, the erection of the Jerusalem Chamber and college hall, the abbot's house (part of his work is still included in the present Deanery), the stone wall of the present college garden, and many other important portions of the monastic buildings.

A century later Abbots Esteney (1474–98) and Islip (1500–32), were especially distinguished as "builders." Both are said to have taken part in carrying to completion the west front, so far as it was completed before the time of Sir Christopher Wren, who speaks (in his report of 1713) of "the two west towers as not of equal height and too low, so that the bells are much lower than the roof; the great west window" (said to have been largely the work of Esteney) "is too feeble, and the gable end of the roof over it is but weather boards painted." Abbot Islip, together with Sir Reginald Bray, K.G., master of the royal workmen, Margaret Beaufort, "Countess of Darbie and Richmond," the king's mother and others, took part on January 24, 1503, in laying the first stone of the new "Chapel of our Blessed Lady." To make room for the new chapel, now called after its founder Henry VII., the earlier lady chapel, including within it that of St. Erasmus, the work of Edward IV.'s Queen, was entirely demolished. The building, the funds for which were provided by King Henry VII. in no small measure from the suppression and appropriation, with license from the Pope, of existing religious foundations, priories, chapelries and tithes, was sufficiently advanced to allow of his own interment on May 11, 1509, and the roof and walls were probably completed by 1512. The total cost is said to have amounted to 14,000*l.* Abbot Islip, within ten days of the king's death, received from him 5,000*l.* for the completion of the chapel, but the actual master of the works was the Prior of St. Bartholomew's. No further addition has been made since that date to the space covered by the Abbey church, with the exception of a small vestry for the use of the choir added in 1881. But Abbot Islip, besides his large share in the completion of the west front, also erected within the church his own chapel, and completed what is now called the "Jericho Parlour," adjoining the Jerusalem Chamber, and the rooms above it which still form part of the deanery.

The maintenance and repair of the fabric of the Abbey, in the word's wider sense, was no doubt a heavy tax on the resources of the community long before the Reformation. Even

* The first recorded instances appear to be those of Wandsworth and of Battersea under Abbot Laurence, abbot about 1159–75, in the reign of Henry II.

so early as Henry II.'s reign there is mention of a grant obtained from that king and the Empress Maud by Abbot Laurence for providing lead for roofing some of the monastic buildings. Their repair was no doubt largely provided for in ordinary times by the income derived from landed and other property situated in no less than fourteen counties, supplemented by the frequent impropriations of tithes and other measures. The result of the Wars of the Roses was no doubt greatly to diminish these resources, and in a remarkable letter from Edward IV. to Pope Sixtus, written in May 1478, he speaks, no doubt in exaggerated language, "of the Monastery of Westminster, consecrated by St. Peter himself, famous for the tomb of the Sainted King and Confessor, founded and built, though not yet completed, by our ancestors," as "now decayed by lapse of time, and almost on the point of actual ruin." The letter, which is in Latin, and dated from Greenwich, may possibly have been written by Abbot Esteney.

It will thus appear that up to the dissolution, or so-called "voluntary surrender" of 1540, the fabric of the Abbey had been both raised and maintained from the following sources:—1. The revenues of various sources expended by kings, either expended themselves or granted to the monastery. 2. The income arising from the estates and property of the monastery, and of those especially assigned to the abbots. 3. The gifts and bequests of individuals. 4. The impropriation of existing religious foundations, such as alien priories, tithes, &c., effected both by kings and by the monastery.

The question of repair and maintenance of the fabric was of course less prominent in this period than that of construction, not only from the comparatively short time during which the buildings had been exposed to decay, and from the smaller amount in the atmosphere of Mediæval London of any deleterious products of the combustion of coal, but also from the absence of any feeling against demolishing the work of former generations in order to replace it with new buildings.

The interval between the dissolution of the monastery in January 1540 and the establishment of the new Foundation, under the title of the Collegiate Church of St. Peter by Queen Elizabeth in 1560, was marked by strange vicissitudes in the history of the Abbey. In the ten years previous to the dissolution the king, Henry VIII., had received from the monastery large tracts of land in London, nominally in exchange for two newly dissolved priories, those of Poughley and Hurley; the property surrendered included Covent Garden, St. James's Park, Hyde Park, and the manors of Neyte and Eybury, &c., &c., much, that is, which is now included in Knightsbridge, Kensington, Chelsea, Belgravia and Westminster.

For ten years (1540–50) the Abbey was the cathedral church of a newly created diocese of Westminster. The Bishop lived in the abbot's house (the present Deanery). The Dean and twelve canons, with two masters and forty scholars, had estates assigned them, partly from the Abbey estates, partly from those of suppressed religious houses. In 1550 the Bishopric of Westminster was suppressed, and the Abbey was by Act of Parliament made a cathedral in the diocese of London. Many of the estates were alienated or "exchanged" with others belonging to the see of London; church ornaments, plate and property carried off. Even the abbot's house, *i.e.* the Deanery, was granted to Lord Wentworth. Queen Mary restored the monastery, recovered the house, and placed Feckenham there as abbot from 1556–58. Queen Elizabeth's charter for a collegiate church, &c., bears date May 21, 1560. Much of Henry VIII.'s settlement seems to have been followed. The great powers formerly enjoyed by the Abbot were largely continued to the Dean; the task of seeing to the repairs of the building was specially named as one of the duties of the treasurer, *i.e.* one of the prebendaries; but it is clear that no separate estates were set apart for the maintenance of the fabric.

Of the first four deans, Bishops Andrews and Neile are mentioned as having given special attention, the one to the repairs of the Deanery, the other to the general management of the property. During the whole of the interval between the death of Abbot Islip, 1532, and the appointment of Dean Williams, 1620, little or nothing appears to have been done for the actual fabric of the church. In 1571 the chapel of St. Catherine, in the little cloisters, was "taken down," and there had been much demolition and alteration of the monastery buildings in a period marked by the transition from a celibate to a married clergy.

Dean Williams (1620-40), who was also Bishop of Lincoln, and, later, Archbishop of York, and had been for a few years Lord Keeper to James I., spent large sums, not less than 4,500*l.*, on the church alone, besides no less, it is said, than 2,000*l.* on the present chapter library. He found the fabric in a dangerous state, and at his own cost repaired the north-west exterior and that of the south-east chapels. A Chapter Act of 1628 expressly contradicts "an unjust report" "that our Dean had repaired our Church out of the diet and bellies of the Prebendaries and revenues of the said Church, and not out of his own," proving both the absence of any real "fabric fund," and the curious survival of the general tradition that the responsibility for the maintenance of the fabric of the Abbey church rested elsewhere than with the members of the new ecclesiastic corporation which had succeeded to the Benedictine monastery.

Of course nothing was done for the fabric in the troubles of the Civil War. Much of the plate, vessels, and internal ornamentation of the church was carried away or demolished, and the clergy ejected, though the school and almsmen were maintained throughout under a "committee of management." Immediately after the Restoration, as large fines were received for leases, considerable sums were expended both in refurnishing and repairing the church in Dean Earle's short tenure of the deanery, 1660-62. But in 1662 Dean Dolben, afterwards Archbishop of York (1683-86), prevailed on the Chapter to assign henceforth a "prebend's share," *i.e.* one-fifteenth of the total annual divisible income, as derived from property in land or houses, to the fabric. The words of the Chapter Act passed on the day of his installation are:—"Ordered that the one-fifteenth part of every fine through the years beginning from the date hereof be reserved and employed for the repairs of the Abbey," the roof and vaulting of which were said to be in actual danger. So much importance was attached to this measure that in his epitaph at York, after mention of the part taken by the archbishop in building at Christ Church, Oxford, and in repair of the Bishop of Rochester's palace at Bromley were added the words "Cænobic Westmonaster. conservato."

The practice introduced by Dean Dolben of setting aside one prebend's share, *i.e.* one-fifteenth, to the fabric fund was adhered to till the handing over the estates to the Ecclesiastical Commissioners in the reign of Queen Victoria. The amount, however, thus produced, in spite of all that had been done by Dean Williams, proved quite inadequate; much of the property of the Abbey consisted of land in what is now part of London, but was then of small annual value. The average amount of the "fabric fund" a generation later, between the years 1711 and 1730, appears to have been 598*l.* 11*s.* 4*d.* The amount of "fines" received for the renewal of leases varied, of course, from year to year. Entries in the chapter-book show that there was a constant demand on the "fabric fund" for the repair of the houses of the Dean and prebends and of the school-buildings; and the introduction to "Keepe's Guide," published in 1683, speaks in the strongest language of the exterior of the building as "shrivelled and parched by the continual blasts of north wind, also by the continuous smoaks of sea-coal, which are of a corroding and fretting quality."

On February 2, 1697, a petition from the Dean and Chapter was laid before the House of Commons, stating that besides large sums laid out in the first two years after the Restoration, they had since that time expended nearly 20,000*l.* on the church, but that their surveyor reported that 40,000*l.* more was needed. A Bill had been read the second time on that day "for completing, building and adorning the cathedral church of St. Paul's." In committee the title of the Bill was enlarged by the addition of the words, "and for repairing the collegiate church of St. Peter, Westminster." The Bill received the royal assent on April 1, 1697. It enacts that one-sixth of the proceeds of a duty levied on coals imported into London should be paid over by certain Commissioners to a Commission, consisting of the Chancellor of the Exchequer, the Lord Chief Justice of the King's Bench and the Dean of Westminster for the repair of the collegiate church, and for no other purpose whatever. The Act was to be in force from 1700 to 1716. The amount produced by this I have not ascertained.

In the ninth year of Queen Anne's reign a fresh Act was passed for the completion of St. Paul's and the building of new parochial churches in London. It raised the coal duty from 1*s.* a chaldron to 3*s.*, and directed that 4,000*l.* a year should be devoted to the repair of the Abbey, which had for some years been vigorously prosecuted under the direction of Sir Christopher Wren, who wrote in June 1713 a very curious and interesting report in a letter to Dean Atterbury, both of what he had done in the time of Dean Sprat and what he still proposed to do. In this letter he speaks strongly of the state of the exterior. "The stone is decayed 4 inches deep, and falls off perpetually in great scales," and censures strongly "the senseless artificers from Normandy," who used the Reigate stone as the nearest like their own Caen stone, being a stone that would "saw and work like wood, but is not durable," so that "the whole fabrick is now disfigured in the highest degree." He speaks also of the north side as both disfigured and endangered by the close proximity of houses, the "tenants of which claim every inch to the walls of the church to be in their leases." The letter is printed in "Widmore" from Wren's "Parentalia." He reports even of Henry VII.'s Chapel, "A nice embroidered work, and performed with tender Caen stone," as "so eaten up by our weather as to call for some compassion." The Act was to be in force from A.D. 1716 to A.D. 1724. Even this large grant did not suffice for the needs of the Abbey.

Between the years 1731 and 1741 sums of 4,000*l.* were granted in at least four or five sessions of Parliament, and in

those years the greater part of Wren's projected plans, including the completion of the western towers and the removal of the houses from the north side, was carried out under Dean Wilcocks. In 1806 Dean Vincent applied to the Lords of the Treasury for aid to save Henry VII.'s Chapel. The Chapter had already expended 1,900*l.* on the roof, but their resources had been greatly crippled in 1803 by a fire in the Abbey roof,* which had involved an immediate expenditure of 3,800*l.*, and the chapel was in the greatest danger, owing to the decay of the stone, brought originally not from Caen, but from Huddlestone in Yorkshire, of which its walls and buttresses were built.

In 1807 a petition from the Dean and Chapter was presented to the House of Commons, in which a statement was made that in the last twenty years they had expended nearly 29,000*l.* on the church, and on the report of a committee of inquiry a sum of 2,000*l.* was granted for immediate repairs. Further grants in aid were made year after year, amounting in the aggregate, in the years between 1809 and 1822, to 42,000*l.* The Chapter continued to set aside for the fabric fund (including the repair of all prebendal houses, &c.) the one-fifteenth agreed to in Dean Dolben's time. To this was added, in due time, the produce of all sales of timber, of fees paid for the erection of monuments, and the interest or principal of any surplus sum from unused balances.

The following is a summary of the history of the Abbey fabric during the last half century. Early in the reign of Queen Victoria a great and growing increase in the revenue of the Dean and Canons was due largely to the great rise in the value of what had formerly been comparatively valueless suburban land owing to the growth of the metropolis and the demand for building sites. In pursuance with an Act of Parliament passed in 1840, the number of canons (or prebendaries) was definitely fixed for the future at six instead of twelve. To two of the canonries was annexed the cure of two Westminster parishes (St. Margaret's and St. John's), and the future income of the Dean and each canon was fixed at 2,000*l.* and 1,000*l.* respectively. The details were set out in Orders in Council of the dates of April 3, 1843, and August 8, 1853, respectively.

By the Public Schools Act of 1868 Westminster School ceased to be part of the "establishment" of the Abbey, and was placed under the management of the Westminster School Governing Body.

In accordance with an Act passed in 1868 an Order in Council was issued, dated August 7, 1869, by which the landed and other property of the Dean and Chapter was finally transferred to the Ecclesiastical Commissioners, and in accordance with a "commutation" or settlement then agreed upon, a certain portion of land and houses, calculated to produce about 9,900*l.* per annum, was made over to the Dean and Chapter, while another sum of equal amount in money was to be paid annually until a further assignment of real estate had been arranged. A sum of 20,000*l.* was also awarded to the Abbey for substantial repairs. The annual sum spent on the fabric out of the income of the Dean and Chapter in the fourteen years following the commutation amounted to 3,444*l.*; in those preceding the same date to about 2,320*l.* It will be remembered that the fabric comprised not that of the church only, but of all the collegiate buildings.

Shortly after the appointment of the present Dean (in 1881) the fabric of the church caused the gravest anxiety. This arose from two causes :—1. The very alarming character of a report on the state of the exterior of the fabric received in March 1882 from the architect and surveyor of the Abbey. It was obvious that a very large expenditure was required to prevent the most serious results. 2. The steady diminution of the resources at the disposal of the Dean and Chapter, owing to the fall in the value of the rents obtainable for the landed estates assigned to them by the "commutation" effected in 1869.

After much and constant communication between the Dean (on the part of the Chapter), the Ecclesiastical Commissioners, and Her Majesty's Government, two steps were taken to meet the difficulty. 1. An Act was passed in 1886 authorising the Ecclesiastical Commissioners, to whom the greater part of the Abbey property had been transferred, if satisfied, after full inquiry, of the urgent nature of the case, to make a grant to the Dean and Chapter of a sum of 10,000*l.* to assist in remedying the "present insecure condition of the Abbey." 2. In 1888 the Westminster Abbey Act was passed, followed by an Order in Council of November 17. In accordance with these the whole of the estates and property belonging to the Dean and Chapter, with the exception of the Abbey itself and the houses of its officials, were transferred to the Ecclesiastical Commissioners, they, on their part, undertaking to pay yearly to the Dean and Chapter a sum of 20,000*l.* Of this, after careful examination of the necessary annual expenses and charges, 3,250*l.* was to be set apart yearly as a fabric fund for keeping the Abbey and collegiate buildings in good substantial repair.

As this sum was obviously inadequate to meet the existing emergency, one of the six canonries, in accordance with the Act of 1888, was suspended, and various clauses introduced for enabling the Dean and Chapter to add, whenever possible, to the funds at their disposal for preserving the fabric.

Every effort is being made at present to repair the decay to which the building is constantly exposed. How far the resources at present available will prove adequate it would be out of place to discuss here. The object of this paper is to show, first, how large has been the part taken in the construction and repair of the fabric of the Abbey by kings of England in earlier ages and by the Parliamentary representatives of the nation in later times; and, second, that while some enlargement of its area may well be considered a matter of urgent national interest, it is of the utmost importance that due provision be made for the maintenance and repair of any addition which may at any time be made to the existing fabric.

The history of the Abbey is full of warnings of the absolute necessity of unceasing watchfulness on the part of those who are entrusted with the care of buildings, whether ancient or modern, which are exposed through a long series of years to the action of a London atmosphere.

* A full account of the fire, which so nearly caused the destruction of the Abbey, remains at the Deanery, in the handwriting of Dean Vincent. It was caused by the carelessness of plumbers, and broke out on July 9, 1803, about noon-day, in the central tower of the roof. It was extinguished before nightfall. Service was carried on from July 13, 1803, till May 9, 1805, in Henry VII.'s Chapel.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE usual monthly meeting was held last week, the president, Mr. Wm. J. Anderson, in the chair, when a paper on "English Renaissance" was read by Mr. John White. The revived Classic style that had its birth in Italy made its appearance in England towards the end of the sixteenth century. First seen in tombs at Westminster and elsewhere, it was before long employed in the princely mansions that the affluence of the period called forth, such as Longleat and Wollaton. English Renaissance is, however, seen at its best in the more modest country houses, and in the tombs and monuments to be met with in every old church. Of all these types the essayist showed beautiful illustrations. A discussion followed the reading of the paper, opened by Mr. John Arthur.

ARCHITECT'S FEES.

AT the Kent Assizes on Saturday the claim of Mr. Frederick Rogers, architect, against Mr. James, for 123*l.* 6*s.* 9*d.*, balance of account for professional services, was heard before Mr. Justice Mathew. According to the evidence, the plaintiff, in the years 1888 and 1889, was brought into connection with Scott's trustees, who were desirous of breaking up a park between Bromley and Chislehurst for building sites. In the course of his duty as architect and surveyor, he met the defendant. A portion of the park was called Sundridge Avenue, and here Mr. James decided to erect a residence. Acting upon his instructions, plaintiff prepared plans, which were in the first place accepted by defendant, but afterwards rejected, on it being ascertained that the cost of the house would amount to about 2,500*l.*, which was more than defendant was willing to spend upon the building. Other plans were afterwards submitted. These were accepted, and tenders were invited for the building of the proposed house. The tender of a Mr. Lay, builder, was accepted, plaintiff being advised that he was a responsible man. The estimated cost was 1,900*l.*, and it was not considered necessary that a clerk of the works should be appointed. Consequently the work of the contractor was entirely under the supervision of the plaintiff, as architect. It transpired that while making a pretext to observe the provisions of the contract with regard to the construction of the building, Lay, who failed before the completion of the contract, really did not do so, and it was ascertained that very defective foundations and footings were constructed, and other works carried out in an unsatisfactory manner. By reason of this defective work it was alleged against plaintiff that he had been guilty of negligence in having failed to discover that the provisions of the contract were not being complied with, and a counter-claim was brought against him to recover damages in respect of this negligence.

For plaintiff evidence was taken to prove that the defective foundations made but very little difference in the value of the house and that Mr. Rogers's charges were fair and reasonable.

For the defendant it was submitted that the omission of plaintiff to find out the fact that the builder was not complying with the specification prepared was negligence, for which he was responsible. There was no definition in law as to what negligence was in such a case, but a man who undertook to do duties for certain payments was bound to bring reasonable skill and care to bear upon the matter in reference to superintendence

and that sort of thing, and if, in consequence of his not exercising such skill and care damages arose, then he was liable.

Evidence was given by defendant and skilled witnesses, who put the amount of damages to which James was entitled by reason of plaintiff's alleged negligence at 870*l.*, which amount included a sum of 400*l.* allowed for a reduced capitalised rental even after all defects in the house had been made good.

Mr. Willis, for plaintiff, pointed out to the jury that, however disastrously a builder might carry out his work, if the architect exercised reasonable general supervision he was not responsible for any defects which were afterwards found to exist.

The jury found for plaintiff for 58*l.*, and awarded defendant 90*l.* on the counter-claim. His lordship gave judgment accordingly, with costs in each case, and declined to stay execution.

THE ROYAL ARCHÆOLOGICAL INSTITUTE.

THE approaching annual meeting of the Archæological Institute is fixed to take place at Edinburgh in the week between Tuesday, the 11th, and Tuesday, August 18. Earl Percy is the president of the institute itself, but the president of the meeting will be Sir Herbert Maxwell, M.P., F.S.A. (Scotland), and the members of the Council of the Society of Antiquaries of Scotland will act as a local committee. Amongst the vice-presidents are the names of the Hon. Hew H. Dalrymple, Archbishop Eyre, General Sir Murdoch Smith, Dr. Cameron Lees and Mr. J. Balfour Paul, Lyon King of Arms. Mr. John Evans, president of the Society of Antiquaries, will preside over the antiquarian section; the Bishop of Carlisle over the architectural section; and Dr. T. Hodgkin over the historical section. The sectional evening meetings, at which several interesting papers will be read and discussion invited, are to be held in the rooms of the National Portrait Gallery. Amongst the places to be visited during the week are the Royal Palace of Holyrood, the Castle of Edinburgh, Stirling Castle, Dunblane Cathedral, Linlithgow Palace, St. Andrews, Dunfermline, Rosslyn Abbey and Castle, Borthwick Tower, Crichton and Hawthornden; a day will be devoted to the caves of Fife, and another to the Roman wall, near Glasgow. On the last day a visit will be paid to the new Forth Bridge; and, if the weather should prove favourable, there is every prospect of a successful gathering.

THE ROMAN WALL, BONNYBRIDGE, N.B.

ANOTHER excursion of the Glasgow Archæological Society was made on the 4th inst., under Mr. Jolly's guidance, to the Roman Wall, near Bonnybridge, where several large and important excavations have been made, which have from time to time been surveyed and visited. The results are being prepared for permanent publication, and will duly be issued by the Society in a volume specially devoted to the subject. Many of the sections made have been filled up both here and on Croy Hill, from danger to animals and damage to property. Several still remain open for inspection, especially those in Seabegs Wood, near Greenhill, one of which shows a very good conduit running across the *vallum*, and these were visited on Saturday. But the chief point of interest was the attempt made by Mr. James Russell, Longcroft, who has admirably superintended all the explorations in that district, to restore the wall and ditch to their original dimensions and appearance, as they stood in the old Roman period, when occupied and garrisoned by the Imperial legions, nigh fifteen centuries ago. A portion of the ancient rampart was selected for the purpose, where the ditch was unusually well preserved, and the mounds on each side well defined, the southern mound representing the *vallum* and the northern the materials that had been excavated from the ditch. Here, as everywhere else, the stone foundation of the *vallum* was exposed, the kerbs being unusually well laid and the bottoming between them very firm. These kerbs, 14 feet apart, were larger and squarer than common, being on an average 12 inches long by 8 inches deep, all formed of the light-coloured, hard sandstone of the district, here everywhere easily accessible. Twenty-five feet of the *vallum* was selected, and on the original stone foundation an endeavour was made to rear up a rampart of turf and earth similar to the original turf wall or rampart erected by the Roman soldiers. The layers that remained lying upon the stone base were left intact, rising in the centre to some 5 or 6 feet, and all the materials that had fallen over the kerbs by time, pressure and decay, on both sides, were carefully thrown inside and packed as firmly as possible in their original position. The idea was that the amount of the existing layers remaining above the base, together with the earthy matters beyond the base down to the true soil, would afford approximately a means, and, in a remote degree, a measure, for restoring the wall to its original height. This, of course, could only be roughly approximate, much of the old rampart having necessarily been removed by natural causes during centuries of neglect and decay. The outside was faced with turf, as in the original plan, though it would have cost too much labour and expense, and been, moreover, beside the purpose intended, to have constructed the whole of turf in the Roman style. In this way the old wall has been completed to the height of 10½ feet, being thus 14 feet broad at the base, as determined by the old kerbs, which are visible on each side, and gradually contracting to a breadth of some 9 feet at the top.

There always exists, for military reasons, a considerable space between the wall or *vallum* and the inner edge of the ditch. This platform has been cleared down to the original surface, and it shows a breadth here of 25 feet, wider than usual; but this greater width is more or less maintained all through Bonnymuir Wood, on both sides of the camp of Rough Castle, in its centre. It was also an interesting point to determine, with some degree of certainty, the exact form of the ditch itself, for several forms were in use by the Romans. Diggings have been made at several places with this view, and both scarps, that next the *vallum* and counter-scarp opposite, have been found of the same angle and the shape that of the letter V, the average breadth at top being 40 feet and the depth of some 15 feet. Here the ditch has been carefully cleared down to the bottom of the V and up both sides, so that its contour is finely shown. The depth of the ditch was a difficult matter accurately to determine after the accumulations of ages, especially when much of the old *fosse* had been filled up more or less along its course. This has now been pretty accurately fixed, based on various considerations and actual measurements after careful excavation, with the above general result.

It seemed to be essential that the Roman soldier standing on the top of the *vallum* and perambulating it to and fro, to the ground traversed by his fellows on each side, should be able to see down into the bottom of the ditch, so that no vantage of ambush for his Caledonian enemies should be provided in a defence made by his own engineers. This principle seems a reasonable means of settling, with some degree of certainty, the height of the *vallum* at different parts along its long line. As now restored, a man standing on the top of the wall, at its restored height of 10 feet, can see easily, across the intervening platform of 25 feet, anyone standing in the ditch and over the mounds that rise from it on its farther or northern slope, from which the Caledonians made their attacks.

WESTMINSTER ABBEY AS A BURIAL-PLACE.

AT the outset of their undertaking the Commissioners who have been inquiring into the monumental question deemed it their duty to study the circumstances which led to Westminster Abbey being chosen for "the interment, and for otherwise preserving the memory of your Majesty's most illustrious subjects." In this inquiry they were greatly aided by the following historical sketch with which they were favoured by the Dean of Westminster:—

The earlier church, together with the monastery of which it forms a part, was built by Edward the Confessor on a scale of grandeur before unknown in England, with the express purpose that it should serve as his own burial-place. It was dedicated to St. Peter on December 28, 1065, and the king, dying on January 5, 1066, was buried near the altar on the following day. William the Conqueror, who asserted himself to be the heir of the childless Edward, and took every opportunity of paying all outward homage to his memory, was crowned hard by the grave of his predecessor on Christmas Day, 1066, at or near the spot on which every successive king or queen who has reigned in England from that day to this has received the rite of coronation. In the immediate vicinity of the Confessor were laid in due time the bodies of his wife Edith, and of Maude the Queen of Henry I., who, inheriting herself the lineage of Alfred, united in her descendants the race of the English kings with that of the Norman conqueror. William, however, and the monarchs who immediately followed him were buried elsewhere, and the growing fame of the church rested mainly on the extraordinary reverence which attached to the memory of King Edward, and on the fact of its being the royal church, belonging hardly less to the neighbouring Palace of Westminster than to the powerful Benedictine monastery.

Between the death of Edward the Confessor (1066) and the accession of Henry III. (1216), a cloud of legends and traditions arose around the name of the king (canonised in 1163), and the renown, both for sanctity and splendour, of the church in which he was buried was carried far and wide by countless pilgrims who came to worship at his tomb. Henry III., desirous at once to do honour to his venerated predecessor, and to tread as nearly as possible in his steps, demolished the greater part of the Norman edifice, and lodged the coffin of the saint in the most sacred (*i.e.* the most eastern)

portion of the beautiful fabric which he began to build in its stead, and the most important part of which he lived to complete. His own grave was placed on the northern side of the shrine to which the body of the Confessor was once more translated, and where it now rests. There, in the chapel beside the Confessor, were laid Henry's son Edward and his Queen Eleanor; there, also, Edward III. and Queen Phillippa; Richard II. and his Queen, Anne of Bohemia, and, last of all, King Henry V., in whose reign the nave or western part of the Abbey was lengthened and nearly completed. The interment of Edward II., of the Black Prince, and of Henry IV. elsewhere than in the Abbey was the result in each case of special circumstances. The demolition of the lady chapel, and the substitution for it of the magnificent Tudor building by Henry VII., sprang probably from much the same feeling as had prompted both the Confessor and Henry III. The founder, indeed, puts forward his desire to do honour to "our uncle of blessed memory Henry VI. and graunt dame of right noble memory Queen Kateryne," but neither of these rests within the building which bears his name; and the sums which he lavished on the edifice, the precaution which he took to endow monks to say masses daily, "while the world shall endure" "at the Jesus altar at our feet," even the direction that burials should be reserved for the seed royal, all point to the hope, felt by so many kings and nobles of an earlier period, that they might secure their own welfare in another life by the erection of a church to contain their tombs, and by endowments conferred on the monastic clergy.

But though these may have been the motives which mainly influenced the monarchs who built and rebuilt and enlarged the old church of St. Peter, other causes were at work which were gradually weaving Westminster Abbey and its surroundings, not only into the annals of the Kings of England, but also into the history of its people. Thus, on the separation of the two Houses of Parliament in 1282, while the Peers were gathered in the Painted Chamber of the Palace, the Commons met from the very first within the Abbey precincts, either in the refectory or the chapter-house, later in the refectory, and from the time of Edward III. for several centuries in the chapter-house; and the Abbey itself, honoured as the burial-place of its saintly founder and of so many of his successors, had become the recognised place of coronations, royal weddings and christenings, and the scene of splendid national pageants.

The interments, even in those early days, were not, however, confined strictly to the seed royal. The abbots certainly, from the time of Abbot Barking in 1246, were buried, with very few exceptions, within the church, and their tombs and funerals were in some cases, as in that of Ware and Islip, only second in importance to those of the kings. Yet it was only by slow degrees that others than those of the royal house, or the abbots of the monastery, obtained such honour. There seems no doubt that William Trussell, Speaker of the House of Commons under Edward II. and under Edward III., was buried in St. Michael's Chapel, not, indeed, in the neighbourhood of the royal tombs, but in the eastern portion of the north transept. In Richard II.'s reign a shock was given to contemporary feeling by the burial, in the sacred and royal chapel of the Confessor, of John of Waltham, Bishop of Salisbury, the king's trusted minister and adviser. Other friends of this monarch, including his tutor, the learned Robert de Waldebey, Archbishop of York, were by his orders interred, the last in St. Edmund's Chapel, the others in conspicuous and honourable portions of the church. In the reign of Henry IV., the year 1400 was marked by the burial of Chaucer, in what is now known as Poets' Corner; and Henry V. laid his standard-bearer, Lewis Robsart, in St. Paul's Chapel. This example was followed by Edward IV. and by Henry VII., to whose favour, it may be presumed, was owing the burial, in places of equal honour, of Humphrey Bourchier, who fell at Barnet, and Sir Giles Daubeney, Governor of Calais.

The monastery was dissolved in 1540, restored 1556, and again dissolved, and the present constitution of the church as a "Royal and exempt peculiar," under its existing title of "The Collegiate Church of St. Peter," was established by Queen Elizabeth's grant in 1560. In the interval a monument had been set up in 1556 in honour of the poet Chaucer, a few paces to the south of the spot where, 150 years earlier, he had been buried. But with the Reformation had come a great change. In the reign of Elizabeth especially the number of burials enormously increased; the chapels around the east end of the church being no longer used as places of worship, became simply receptacles of tombs and monuments, a wholly different character and style were gradually introduced and the effigies of the dead were placed in every attitude, lying on the side, kneeling, seated and standing. No less than four monuments of great ladies were placed on the site of the ancient altar of the chapel in which they were severally entombed. Mural tablets also began to appear, together with vast and lofty structures, such as those of Cary Lord Hunsdon, and of Lord Norris, his sons and family.

In the charter of Elizabeth nothing is said of burials in the Abbey, though in the Elizabethan statutes the Dean is mentioned as the person charged with the care and custody of the royal monuments. But it is certain that for some generations longer the honour of interment beneath its floor was mainly confined to those who were either connected with royalty by blood or affinity, such as the Seymours and the Greys, or had served the sovereign as great statesmen, lawyers or soldiers. At the close of the sixteenth and in the opening of the seventeenth century, however, we see beginning to appear the dawn of other claims to such honour. Spenser was the first poet buried, 1589, expressly and solely as a tribute to his fame as a poet; soon afterwards the same honours were paid to the memory of Beaumont in 1616. The commencement of the Civil War marked clearly a new era in the history of the Abbey. Dean Stanley says it was the period which, more than any other, shows the strong hold that it had laid on the minds of the whole nation:—"When not even the excess of Puritan zeal or the sternness of republican principles could extinguish in the statesman of the Commonwealth the longing to be buried in the royal monastery." It is evident that both the Protector and the Parliament were deeply imbued with what may be called the modern sense of the national value of such commemoration. Not only was Oliver Cromwell himself buried in the church sacred to the memory of Edward the Confessor, but in his lifetime he caused the remains of Ireton to be brought from Limerick, and laid in the easternmost part of the royal chapel, at the very spot expressly designed by the founder for an altar of "our uncle of blessed memory King Henry the Sixth." And Clarendon tells us how the body of Blake, the great Admiral of the Commonwealth, who died at the entrance of Plymouth Sound on his return from his last famous victory over the Spaniards, was by Cromwell's orders carried up by land to London, and buried with all solemnity possible, and at the public charge, "in Harry the Seventh's Chapel, among the monuments of kings, in order to encourage his officers to venture their lives." This, says Dean Stanley, was the first distinct notice of burial in Westminster Abbey as an incentive to heroic achievements.

Thenceforward tombs and monuments were oftener admitted within the church, avowedly as rewards for distinguished merit. The circumstances of each of these have been woven by Dean Stanley into a tale of surpassing interest in his "Memorials of Westminster Abbey." Here we need only recall the names of a few of the famous men so commemorated in order to show how, year by year, the interest in the Abbey became more closely bound up with the history, and grew with the growth, of the nation.

The chiefs of the Restoration, George Monk, Duke of Albemarle; Edward Montague, Earl of Sandwich; and James Butler, Duke of Ormond, were, like Buckingham in the reign of Charles I. and the Parliamentary leaders under the Commonwealth, buried amongst the kings in the chapel of Henry VII., and Clarendon, the Royalist historian of those troubled times, was laid at the foot of the steps leading into it. The grave of Bentinck, Earl of Portland, under its east window, represents the statesmen of the Revolution of 1688, while many more or less famous heroes and victims of the Dutch War and of the War of the Succession in Germany and Spain rest in other parts of the church. The funeral of the great Duke of Marlborough in 1722 was one of the most magnificent that ever passed through the portals of the Abbey, and his body remained for a time in the vault which held the ashes of Ormond and had been for a while the resting-place of those of Cromwell.

"The successors of Marlborough by land and sea carry on the line of warriors now chiefly in the nave, but the circle of their names takes a wider sweep with the advance of the century;" for the wars by which India and Canada were won and the North American colonies were lost have left many and marked traces in the graves and statues of those who perished in them. There are cenotaphs of Sir Eyre Coote, General Lawrence and others famous in the Indian wars of that time. There is also the huge structure to the illustrious but short-lived General Wolfe and mural monument to the ill-fated André. Lord Howe for a special reason was buried at St. Paul's, but his great battle on June 1, 1794, is recalled by the memorial to three of his captains, and three others are commemorated who fought in Rodney's crowning victory. "The funeral of Lord Dundonald in the nave, thus at the close of a long life reinstated in the public favour, terminates the series of naval heroes which begins with Blake. Nelson, who at Cape St. Vincent looked forward only to victory or Westminster Abbey, found his grave in St. Paul's." There, also, Wellington and Picton were buried, and few indeed of the leaders in the Peninsular War have tombs or memorials in Westminster Abbey. The later Indian campaigns are represented by the graves of Sir George Pollock, of Outram, and of Clyde; but the Crimean War and the Indian Mutiny are only recalled within the church by the memorial windows of the north transept, and outside it by the granite pillar at the western entrance, to the memory of the Westminster scholars (with Lord Raglan at their head) who fell in those campaigns. Yet

if the Abbey has not within the last hundred years so often as in early times received the remains or the monuments of distinguished soldiers and sailors, its honours have been more freely given to great Englishmen, who in other ways have won their titles to fame. They are so many that we will not here do more than mention a few of the most eminent in the various companies into which they have been grouped. We have already seen how the claim of kindred genius gave to Spenser a grave beside that of Chaucer, and how there were gathered around these two the tombs or monuments of Beaumont and Drayton and Ben Jonson. In like manner were afterwards added in the Poets' Corner, or in the south transept hard by, memorials of Shakespeare and Cowley, of Dryden and Milton, of Prior and Thompson, of Gray and Burns, of Longfellow and Browning, and of many others hardly less illustrious. There, too, is commemorated the work of a crowd of other men of letters, such as Goldsmith, Johnson, Brinsley Sheridan, Campbell, Southey, Wordsworth, Keble, Lytton, Macaulay, Grote, Thackeray and Dickens.

In various parts of the Abbey was also from time to time recorded the fame of great theologians of many generations, and of schools of religious thought differing as widely as those of South and of Barrow, of Watts and the two Wesleys. Of philanthropists, Wilberforce was buried there with the attendance of both Houses of Parliament, and "his statue sits nearly side by side with Fowell Buxton." At the western entrance stands the marble image of Lord Shaftesbury, and in the centre of the nave is the grave of Livingstone. Together with these are found memorials of celebrated doctors, architects, engravers, sculptors and musicians, and of famous actors and actresses. "It is a proof," says Dean Stanley, "of the late slow and gradual growth of science in England, that it has not yet appropriated to itself any special place in the Abbey;" but Sir Isaac Newton was, at the public cost, buried beneath its floor, and his monument holds a conspicuous position, while the achievements of other illustrious men of science, as, for instance, Herschel and Darwin, and the great engineers, Watt, Stephenson and Brunel, have also been recorded.

In the north transept, long appropriated to statesmen, and in the angle of the north-west transept, known as the "Whigs' Corner," Chatham and Mansfield, and Follett, Pitt and Fox, Castlereagh and Grattan, Tierney and Mackintosh, Perceval and Lord Holland, the Cannings, Peel and Russell, Palmerston and Cornewall Lewis, Cobden and Beaconsfield and many other political rivals, have found together their graves and monuments; while in the neighbouring aisles are laid the remains of many of those who added India to the British Empire, and there, too, a memorial was, after his chequered career, accorded Warren Hastings, "in that temple of silence and reconciliation where the enmities of twenty generations lie buried."

The foregoing brief narrative offers but a bare outline of the striking series of events by which Westminster Abbey has from its foundation been constantly identified with the annals of England, but it may be enough to show how it has come to pass that the old monastic church is looked to almost by common consent as the place in which national honours may most worthily be given to the illustrious dead of each succeeding age. We have seen how, though destined at first to be exclusively the burial-place of kings, no long time elapsed before great warrors and prelates, the only subjects who could in those days attain to pre-eminence, were admitted to the royal fane; how as time went by and knowledge spread, and others were given the chance of winning renown, to them also were granted graves and memorials within its walls, till as the circle of distinction further widened these honours were allowed to the most famous Englishmen of all professions and callings from whatever class they had sprung. The majestic pile, which rises in the busy centre of the great city, is indeed well suited for its solemn office. The harmonious proportions of its beautiful interior, the dark shadows of its lofty nave, the dim light of its long drawn aisles, fill the mind with feelings of reverence and awe, and Time, while it has flung around the building the mysterious charm of age, has also dowered it with memories which cover the whole history of the Anglo-Saxon race.

It is long since any royal tomb has been set up or any royal burial has taken place by the shrine of the Confessor, but the practice which renews in the old church of the palace at each successive coronation the great bond between the sovereign and the people has never been interrupted. So it was that on the occasion of the last State ceremonial, the noblest, the most touching, the proudest of all its pageants, when Her Majesty desired to make solemn and public thanksgiving for the prosperity and happiness of the land during fifty years of Her rule, it was felt that nowhere else could that great festival of settled government so fittingly be held as at the spot where every one of Her Majesty's predecessors had for eight centuries been crowned, where all around were lying in their last sleep the great Englishmen whose courage had achieved the dominion, whose genius had inspired the language, whose patriotism and wisdom had won the liberties and given the laws by which gradually and through many generations had been built up the greatness of the nation. Westminster Abbey, in its tombs and its memorials, joins the ancient with the modern monarchy of England, and binds up the past with the present of its people.

From the above summary it will also be seen that the habit of doing honour in Westminster Abbey to the memory of illustrious Englishmen was not established by the will of any-one man, nor in obedience to any Act of Parliament, nor was it carried out in accordance with any rule thought out beforehand. The custom grew and gathered force gradually and almost unobserved. This peculiarity is in harmony with the character and traditions of the people; but, on the other hand, such want of system and of adequate control has had the serious drawback that burials and monuments have in a multitude of instances been accorded to those who had no claim to national commemoration, and little heed has been paid to the necessary limits of space.

Immediately after the Restoration, as we have seen, the number of interments and memorials went on increasing rapidly, and there was at that time apparently no sense at all of the duty of economising the room available for such purposes. Burial was claimed for many of the lesser nobles, some of whom lie in the Ormond tomb, as Dean Stanley describes in "coffins upon coffins." But besides those who may have been thought, in their time at all events, notable personages, others were admitted who had no right whatever to such a distinction. The qualification of mere neighbourhood was allowed, a practice which naturally arose when once the old idea of the Abbey being exclusively a royal burying-place had become obscure, and application was made on behalf of those who had lived in the vicinity to be buried in the Abbey, because there was no other cemetery within easy reach. Want of space for graves or for monuments does not seem to have been felt or feared, even in the most highly prized parts of the Abbey, until the close of the seventeenth century; and as the chapels north and south of the eastern end became crowded burials began to take place, and monuments were set up in the whole of the choir aisles, in the north transept, and especially in the nave where but one had been erected before the time of the Civil Wars. Yet for several generations thereafter no effectual attempt seems to have been made to check this lavish use of the space that still remained. The selection in 1727 of a spot in the nave in front of the choir, which, as one of the most conspicuous in the Abbey, had been previously refused to various noblemen, for Isaac Newton's tomb and monument "marks the moment at which the more sacred recesses of the interior of the church were considered to be closed or to have lost their special attractions, whilst the publicity of the wide and open spaces hitherto neglected gave them a new importance."

At last the alarm was raised that the Abbey was being "loaded with marble," and various remonstrances, serious and satirical, were urged against the further crowding of the monuments. Amongst others the Dean reminded us of a mock "petition from posterity, to entreat that their case might be considered," which was addressed to the Dean and Chapter of that day. The effects of this pressure of public opinion may be traced in the steady diminution of interments in the Abbey. In the ten years 1681-90 there were 100 burials within the Abbey, in addition to 125 in the precincts. A hundred years later in the corresponding decennial period, 1781-90, there were but 31, and during the last seventy years they have hardly exceeded an average of one in each year. No registers are extant to tell the number of burials which took place earlier than A.D. 1600, but from those records which do exist it appears that between 1600 and 1863 there were 1,147 interments within the Abbey and 1,806 within the precincts. In the time of Dean Stanley, 1863-81, there were twenty-one burials within the Abbey and five in the precincts. Since the present Dean of Westminster has occupied the office seven interments only have taken place. These make in all since the year 1600, 1,175 within the Abbey and 1,811 in the precincts up to the present time.

It would not be possible to ascertain with certainty the exact amount of space still remaining for interments, except by taking up the pavement and searching the existing tombs; but so far as we can form an opinion from the evidence of Mr. Wright, the present clerk of the works, and of Mr. Poole, formerly master mason, it is probable that space might be found in the western end of the nave for about forty-five coffins; for about twenty more in the concrete which supports the wall at the north-west corner of the north aisle (spreading out at this point to some extent under the floor of the building); and besides, it is possible that in some of the larger vaults not yet quite full, and in a few other places, there may be room for twelve additional graves. Thus the number of future interments, even should it be deemed desirable to make use of every spot available for the purpose, cannot, we think, be set at more than ninety to ninety-five.

But it is when we come to consider "the present state of the Abbey as regards the facilities which it offers for preserving the memory of your Majesty's most illustrious subjects" otherwise than by interment beneath its floor, that we are confronted

with the most serious results that have followed from the want in former times of any adequate control or foresight in granting such national commemoration. The mutilation and destruction at various times of the old and delicate arcading of the church, and the curtailment of ancient monuments to afford sites for later ones, as well as the inappropriate attachment of tablets and busts to the pillars of the building, are visible evidences of the carelessness with which the intrusion of such memorials was for many generations permitted; while few will deny that the general effect of the stately interior of the building has been in some places seriously marred by the overcrowding of statues and bulky structures. Dean Stanley mentions and describes 214 monuments of persons interred within the Abbey and 94 cenotaphs, making together 308; besides, 42 memorials of those buried in the precincts are recorded by him: and while pleading eloquently in defence of the variety of tastes exhibited, and even for the effect produced by the unequal distribution of these honours, he insists that the time has all but come when it will be impossible, from want of space, to continue further the roll of monuments within the limits of the existing building. It was indeed stated to us in evidence that he had, in conversation, declared that there remained but two spots still available for the erection of statues to men of the greatest eminence.

VENTILATION OF THE HOUSE OF COMMONS.

AT one of the meetings of the Committee appointed to inquire into the ventilation of the House of Commons, Mr. David Plunket presiding, Mr. William Prim, consulting engineer to Her Majesty's Office of Works, was recalled, and in further examination by the chairman, described the arrangements for ventilating and warming the committee-rooms and corridors. The air, he said, was taken in from the terrace through the area at the bottom into a chamber, whence it passed along into a passage, and so to the heating apparatus, from which the air passed into the committee-rooms through the floors and skirtings, and in some places through a grating at the back of the chairman, the air coming into the corridors leading to the committee-rooms underneath the seats. The vitiated air passed through the ceiling by a shaft to the Victoria Tower, at the base of which there were two furnaces for the purposes of creating a draught. Bad air could only get back into the other rooms if there was a down-draught from the main vitiated air-shaft, which occasionally happened when a strong wind was blowing. A back-draught could be obviated by placing in valves such as had already been used in some cases. At the request of the Committee, the witness promised to prepare a plan showing where he would recommend that these valves should be placed. Continuing, the witness explained the difficulty there would be in letting an increased quantity of air into the reading and tea-rooms without causing a draught. Complaints had been made of a smell of cigar smoke in the House, which he found to be occasioned by a number of gentlemen smoking on the terrace close to the intake. A smell resembling sewer-gas was also complained of, but he was convinced that this came from the sulphurous fumes of passing barges, and not from the sewers. This opinion was confirmed by Mr. Jones, clerk of works to the House of Commons.

Mr. John Taylor, recalled and further examined by Sir Henry Roscoe, said that the alleged inefficiency of the drainage of Westminster would have no effect as regards the drainage of the House into the sewers. But the ventilators from the main drainage system were in a most foul condition, and they might influence the air in the neighbourhood. That was a most serious state of things, which ought to be remedied. In regard to the drains of Westminster, he recommended that a letter should be written to the vestry by the chairman of the committee, but the main sewers under the control of the County Council were in the worst condition, and ran immediately outside the gates of New Palace Yard. It would be expensive to carry the ventilators up to a greater height, but there would be no difficulty in carrying off the foul gas from the main sewer by that means. Mr. Jones, clerk of the works to the Houses of Parliament, recalled and further examined, explained the sanitary arrangements within the House, which, he said, were on the whole satisfactory. The Hon. E. Chandos Leigh, Q.C., the Speaker's counsel, complained of the smell of cooking and the heat in the room occupied by him, and suggested that another room might be given him. Mr. Isaac Shone, examined by Sir Henry Roscoe, said he was responsible for the ejector system, which was now working satisfactorily in the House. So far as the main drainage of the building was concerned, he could vouch that during those periods when there was not a heavy rainfall there was perfect ventilation. Mr. Phillips, who had acted as assistant engineer under Mr. Shone, having given detailed evidence with reference to the situation of the drains in Westminster, the Committee again adjourned.

On Monday last Mr. Binnie, engineer to the London County Council, explained the construction of the sewers in Westminster, which, he said, carried off not only the sewage matter, but also the storm water, upon which, as there was no system of flushing the sewers, they were dependent for that purpose. It had been pointed out by Major Tulloch, before the Committee of 1885, that those sewers might get charged with sewer-gas, and that when there were storms the sewer-gas might be forced out into the street. That was exactly what he was afraid of now, although it did not happen in the case of the heavy storm of last week. Then again, if, unfortunately, there were any house connections with the sewer, the gas might be forced up into the houses by the bursting of the trapping. Sir Joseph Bazalgette had also reported in January 1885, recommending that a communication should be addressed to the Westminster District Board drawing their attention to the suggestions of Major Tulloch's report, and stating that the Metropolitan Board of Works concurred generally with them. Sir Joseph himself also expressed his concurrence in those recommendations, and considered that this sewer, although, perhaps, not a source of immediate danger, should be abolished. This, however, had never been done, though a pipe would be quite sufficient in its place. The alteration would remove the evil of having a storage for sewer-gas and vitiated air under the streets. The fault that the County Council were gradually getting into with their main drainage system was that the street ventilators were being closed and the gas penned up. In places where the street ventilators were kept open and pipes were carried up above the summits of the houses there was perfect ventilation of the sewers. There was a certain amount of danger arising from the want of ventilation. Supposing the authority of the House were obtained for introducing a similar system there by carrying a ventilating pipe up the side of the Clock Tower, he should certainly recommend the County Council to do it at once. It was best to continue to get the air for ventilating the House from the river, and he was inclined to agree with Mr. Prim that the disagreeable smell which was sometimes noticed probably came from passing barges and steamers.

Mr. Wheeler, surveyor of Westminster, was then examined, and said that the drainage of Westminster outside the Houses of Parliament was in a most unsatisfactory state, owing to the want of capacity in the low-level sewer, in which radical changes ought to be made, either by enlarging the sewer or by taking away the water which it could not at present manage to carry. He did not agree with the suggestion made by Mr. Binnie of carrying a ventilating pipe up the side of the Clock Tower, and considered that gas given off by sewage should on no account be let out into the streets of London.

The Select Committee on the Ventilation of the House of Commons will, it is expected, examine one more witness, and then proceed to the consideration of their report. It is believed that they will recommend an enlargement of the air-inlets, and will also make a number of suggestions with a view to improving the general atmosphere of the committee rooms. The method of ventilation adopted in the lobby is also open to considerable improvement, the system of introducing cold air through gratings in the floor being a constant source of danger to members and attendants in hot weather.

REPAIRS OF PUBLIC BUILDINGS.

IN the House of Commons on Monday Mr. Buxton asked the First Commissioner of Works whether Messrs. Holland & Hannen, contractors for repairs, &c., of public buildings, agreed under their contract to pay the painters employed under their contract at the minimum rate of 8½*d.* an hour, the ratio generally accepted as current in the trade for competent workmen, and whether he was aware that, in violation of their agreement, they had within the last few weeks reduced the wages of some, or all, of the painters engaged on the work to 7½*d.*, and, if so, what action he proposed to take in order that the resolution of the House of February 13, in regard to the payment of fair wages under Government contracts, should be properly enforced.

Mr. Plunket, in reply, said that the question of the hon. member seemed to be based upon a misconception. Messrs. Holland & Hannen are not departing from the terms of their contract. The facts are that in the schedule of rates accompanying their tender the minimum rate for painters was higher. But this was owing to an error, and when they discovered the error Messrs. Holland & Hannen wrote to the Office of Works for permission to correct it, and to reduce the minimum rate for painters to 7½*d.* per hour. Having satisfied himself that for much painters' work 7½*d.* would represent the rate of wage "generally accepted as current for competent workmen," he agreed to the alteration, and the contract has been drawn on the basis of a range of wages for painters of from 7½*d.* to 9½*d.* per hour.

A Russian Church will be solemnly opened at Biarritz in September.

Correspondence

Architectural Education.

SIR,—After reading the remarks of the different speakers on Monday evening last, I am inclined to think that there is an element of pride that prevents the A.A. from looking beyond its own professional borders for pecuniary aid. It is of course pleasant for any society—architectural or other—to be independent, to do everything within itself and within its own walls. Some societies can do this because they have members who are men of wealth, and because their objects are more popular than I am afraid architecture can claim to be, at all events, until Mr. Kerr has educated the British public. The R.I.B.A. appears to be willing to assist the A.A. with means, but it is made pretty clear that much must not be expected.

Under these circumstances I venture to suggest that the Science and Art Department and the County Council and the City Companies be applied to. Mr. Baggallay and his friends, who have prepared "the scheme," could compose an irresistible petition, for he would speak of architecture—first of all the arts—being in pecuniary difficulties, and he might plead that such a state of things is a disgrace to the nation, for living architects have done everything in the way of liberality that could possibly or fairly be expected from them. When we see what science has done and proposes to do, it really seems that architecture, which includes all science and all art, deserves to be in a better position than, according to "the scheme," she really occupies. It is of national importance that architects should be properly educated. As I began by saying, the cause of the present difficulty is that those who have its interest at heart do not, like other people, look far enough afield. By adopting this plan science has erected and endowed the institution in Exhibition Road, South Kensington. She has just sent a memorial to the City Corporation praying it to grant a site on the Embankment for the erection of an art gallery which a munificent donor proposes to build. These gentlemen are moved to do this because of the many strong objections from the scientific point of view to the site suggested for the gallery in the first instance, *i.e.* on the vacant land adjoining the above building in Exhibition Road, and which they consider will be required for their own future purposes.

According to the report of the National Association for the Promotion of Technical Education, just published, the amount of public funds devoted to technical instruction, including the expenditure of the Science and Art Department, has about doubled during the year, while further expansion is to be looked for in the immediate future.

Perhaps the necessary help might come from this Association if the Architectural Association memorialised it. Its duties, it appears, have suddenly undergone a radical change. It has been so successful that its function is no longer propagandist, but simply consultative, for the movement is rapidly passing into its final stage. People no longer require to be told what they ought to aim at, but rather to be shown how the object may be gained. Technical education throughout the country has received a wonderful impetus from the Local Taxation Fund of 1890.

The report above alluded to shows that by far the larger part of the country has decided to give the whole amount to education, and though Middlesex and London have sunk the money in the rates, it must be remembered that the resolution only covers the proceeds of the new fund for a single year.—Yours truly, L. S. D.

One Hundred Pounds Reward.

SIR,—In a contemporary of last week is inserted, with the above heading, a notice of a certain ventilating company which, it will be admitted, exceeds the limits of legitimate advertising, seeing it is evidently designed to prejudice rival firms by a general accusation of unfair dealing. As I was for a number of years, until recently, in the service of Messrs. Boyle, it may be taken by some persons that the accusation is aimed at me, for the purpose of attempting to damage the "Climax" Ventilating Co., in whose service I now am. I would only suggest to Messrs. Boyle that they should make a distinct and straightforward accusation which, if it involves either the credit of the "Climax" Ventilating Co. or myself, will not be allowed to go unanswered, and Mr. Boyle will have the opportunity of repeating his assertion, on oath and under cross-examination, in the witness-box.

If Messrs. Boyle assert that the ventilators of the "Climax" Ventilating Co. "imitate the external appearance of the air-pump" or any other ventilator, I challenge them to prove it, as such an assertion bears on its face its own refutation, it being the aim of the company I have the honour to represent to take an entirely new departure by making even the cheapest of their ventilating appliances to harmonise with the character and architectural features of the building on which they have to be fixed.—Your obedient servant, J. ALFRED DARQUE.

15 Great George Street, Westminster.

P.S.—I would add I have sent a copy of this letter to each of the building papers.

The Eight Hours' Movement.

SIR,—The letter on page 30 from "The Workers" of Mr. Renton Gibbs's firm at Liverpool shows a step in advance has been taken. Will "The Workers" please state if they take breakfast before beginning work in the morning? Also, as they work 48 hours in the week, do they work 8½ hours on five days so as to stop earlier on Saturday, or how?

I have been advocating eight hours a day in the building trades for the first five days and five hours on Saturday, making 45 hours in all. Begin work each day at 8 A.M.—taking breakfast before beginning—then dinner from twelve to one, and stop at 5 P.M.

Were these hours introduced many working men, in place of being cooped up in narrow slums in our cities and large towns, might be able to stay in the country and rear their families in a healthy atmosphere instead of otherwise, as is so much the case at present. This eight hours' system may yet be the great means of counteracting the congestion of our cities.—I am, &c., W. B.

Glasgow: July 11, 1891.

GENERAL.

The Exhibition organised by a local society, and held in the palace of Versailles, contains this year about 800 paintings.

Mr. E. Burne-Jones, A.R.A., in collaboration with Mr. William Morris, has completed three windows for St. James's Church, Marylebone.

An International Exhibition of Photography has been opened in Brussels, and a congress on the science will be held next month.

M. Rodin, the French sculptor, has been entrusted by the Société des Gens de Lettres with the commission for the memorial of Balzac, the novelist, which is to be erected in Paris.

The Building Act Committee of the London County Council have recommended that Mr. Ellis Marsland, district surveyor for East Kensington, be appointed district surveyor for Camberwell upon condition that he resigned his present appointment, and that Mr. A. Crow be appointed district surveyor for St. Mary, Whitechapel, Christ Church, Spitalfields, the hamlet of Mile End New Town, and the Tower Liberty.

The Ecclesiastical Commissioners have authorised the sale by public auction of a portion of the site of the church of St. Olave Jewry, in the City of London.

The Ayr Town Council have agreed to pay Mr. Mercer 46*l.* for extra work done by him while acting as Burgh Surveyor.

Plans have been passed in Kirkintilloch Dean of Guild Court for the erection of a new Roman Catholic Church, which is expected to cost 5,000*l.* Mr. P. P. Pugin (Pugin & Pugin), Westminster, is architect.

Mr. James Mitchell has been definitely appointed Dean of Guild for Montrose in place of the late Alexander Lyall.

The Walsall Town Council have resolved to purchase 3,384 yards of land in Lichfield Street, as the site of public baths, which, if built at the back, will allow the front land to be disposed of at a greatly enhanced price for commercial premises.

The Birmingham Free Libraries Committee have appointed Mr. Henry Martin architect for the proposed free library and baths at Small Heath.

A Parliamentary Return has been agreed to be supplied on the motion of the Duke of Westminster, showing the number of churches and cathedrals in every diocese which have been built and restored at a cost exceeding 500*l.* since 1873, the expenditure in each case, and the sources of the funds.

The Joint Committee for restoring the Cork Courthouse offer a first premium of 100*l.*, a second of 60*l.*, and a third of 40*l.* for the best designs, to be sent in before August 28. The author of the design selected will be employed to superintend the work.

The Wick Town Council have agreed to petition the Secretary for Scotland to promote a grant of 50,000*l.* for a harbour at Gill's Bay, in the Pentland Firth, and a branch line railway from that place to Wick, a distance of about seventeen miles.

The Competition for laying out the Corbett estate, Towyn-on-Sea, has ended as follows:—1st, Mr. W. Dunbar, C.E., Rhyl, 100*l.*; 2nd, Mr. James B. Hipkins, architect, Liverpool, 30*l.*; 3rd, Messrs. Veal & Sant, architects, Cardiff, 20*l.* There were sixty-two designs sent in.

The Architect.

THE WEEK.

THE Sheffield School Board have decided to purchase the Wentworth Café in Holly Street for 3,875*l.*, and thus the whole block of which the Firth College and Central School form a part will belong to the town. The Central School is to be enlarged, plans by Mr. J. MITCHELL-WITHERS having been adopted. The additions will comprise rooms for cookery classes, dining-rooms, joiner's shop and metal-working shop and laundry; machine drawing and lecture-rooms, to accommodate 120 students; physical laboratory and lecture-room for 50 students; chemical laboratories for 140 students, and lecture-room, balance-room and other necessary stores. There will be also an elementary school building at the corner of Holly Street and Bow Street, with accommodation for 292 infants on the ground floor, and with a mixed school for 250 on the first floor. A playground is provided on the top of the building and the basement is devoted to workshops and playsheds.

AT the Manchester Assizes, Mr. W. HORROX, of Stockport, sued Messrs. FAULDER & Co., Limited, for 550*l.*, amount of fees as architect. In January 1890 the defendants began to build a factory at Heaton Norris, and the plaintiff, who was then in the employment of Mr. HARKER, and had experience of such buildings, was engaged as clerk of the works at a salary of 200*l.* for the first year. The plaintiff's case was that in March he was asked by the defendants to undertake the duties of architect. The sum the plaintiff was to receive for superintending the erection of the building was not exactly stated, but it was to be a reasonable remuneration above his salary as clerk of the works. This the plaintiff now fixed at 5 per cent. on the cost of the building. The defence was that the plaintiff had not been asked to undertake the duties of architect and had not performed them. The jury found a verdict for the plaintiff for 150*l.* In cases of this kind it is well to have the arrangements in writing, but apparently both sides avoided definiteness, and trusted to the chapter of accidents to bring about a satisfactory ending.

SIR HENRY ROSCOE has prepared a report, in which he gives the results of some experiments made by him with regard to the possibility of freeing the air supply of the debating chamber of the House of Commons, not from particles of dust and fog, which has already been accomplished, but from the floating germs which are constantly present in the air. These germs, generally attached to particles of dust, were unable to pass through a dry and firm plug of cotton wool, the fibres of which would filter out the most minute particles. The first series of experiments were designed to ascertain the number of germs falling on a given space in a given time. For this purpose flat covered glass dishes containing a film of sterilised nutrient gelatine were exposed. The invisible germs fell on and were retained by the moist film of gelatine, and finding a material suitable for their growth developed with rapidity, so that after an incubation of several days, colonies of various sizes made their appearance. Aerial germs consisted of two kinds, moulds and bacteria, and it was easy by mere inspection to distinguish colonies of the one from those of the other. Experiments were made on Thursday, February 26. The ventilating fan was running, and the air had been filtered for half an hour. During the exposure of the plates the fan was stopped. The air was examined, and the result showed —first, that there was a larger number of germs in the air of the terrace than in the air of the chamber before filtration; and, secondly, that after filtration the number of germs had greatly diminished. For the second, third and fourth series of experiments (February 26, May 26 and May 28) the fan was running a further three-quarters of an hour and then stopped for the exposures. By these the result obtained from the first series was decidedly corroborated. The next object was to ascertain the actual number of germs floating in a given volume of air. For this purpose a measured quantity of the air was drawn by means of an air-pump through a sterilised plug of glass wool upon which the germs were deposited. This plug was afterwards so treated that each single germ formed a visible colony, and then the number of these could be easily counted. It was again very strikingly shown that a large reduction of the number of germs takes place in the air after filtration. The most satisfactory method was that known as HESSE's method, by which the measured volume of air was drawn through a long tube coated internally with sterilised gelatine. From other experiments it was found that the filtered air contained very few germs, and these had either escaped filtration, or more probably were due to the accidental entrance of unfiltered air or dust particles in the vault beyond the filter. The results of the experiments as a whole proved that the filtration of the air on a large scale could practically remove all the floating aerial germs. The effect of filtration upon the air within the chamber itself had yet to be ascertained.

LIVERPOOL is far from being a model of sanitation, and few that are acquainted with the condition of the city will be amazed when they learn that the medical officer of health has just condemned certain property which is owned by the Corporation. The houses are to be found in courts in Cable Street, Brook Street, Worfield Street, Levesley Place, Ennerdale Street, Lower Milk Street, Back Bridport Street, Bolton Street, Roscoe Street, Upper Frederick Street, Cookson Street, Blundell Street and Newhall Street. There are a great many houses described as being unfit for human habitation. The gravity of the charge is not easily to be got over, and the Finance Committee acted discreetly in intimating that they will be prepared to treat for the sale or demolition of any property which may be included in any report of the medical officer of health made in pursuance of the Liverpool Sanitary Amendment Act, 1864, or any statute or order amending the same. The medical officer of health says that when making reports he does not know who are the owners of insanitary property, nor does he consider it advisable that he should.

THE people of Glasgow are to be envied for the abundance and purity of the Loch Katrine water supply, but they occasionally forget that there are limits to the quantity that is obtainable. The normal yield of the lake is 40,000,000 gallons, but for some weeks about one-fifth more, or 48,000,000 gallons, have been consumed. It is supposed that the excess is wasted. Not only is the amount of storage water diminished, but it is evident that, in proportion as the depth of water in Loch Katrine is reduced, the height to which it can be supplied in the city is also reduced. In a case of the kind the difficulty is not to be got over by any effort of the Water Commissioners or their engineers. The prevention of waste rests with the citizens, and it is their interest to see that water is not allowed to be wasted. From the great pressure, a smaller quantity of water serves for flushing in Glasgow than in London, and it is therefore absurd to imagine that for sanitary purposes the water should be at all times running in the houses.

THE amount of money received for admission to the exhibition in the Champ de Mars will be gratifying to the members of the Société Nationale des Beaux-Arts, but it will be a surprise to many visitors, as the galleries were rarely crowded. Last year, when the affair was a novelty, 172,445 francs were paid; this year the sum has been elevated to 212,740 francs, thus showing an increase of 40,295 francs. It is not easy to comprehend the nature of the attractions which induced so many people to visit the place. Can it be the proximity of the Eiffel Tower? The large sum received will, however, enable the committee to pay off a part of the debt incurred for curtains, carpets and couches. There will also be money available for the travelling studentships. Next year the Society will be enabled to start with renewed confidence. The Parisians may not consider the works exhibited as masterpieces, but they can applaud a revolt, and are not unwilling to inflict a little punishment on the men who have brought discredit to France by following a course of meddling and muddling in the Salon for many years.

ALFRED STEVENS AND HIS WORK.*

EVERY biographical dictionary is partly made up with accounts of men and women who have appeared in this world under conditions that are surprising, because they denote indifference or neglect. In their cases we seem to see departures from the operation of that law of fitness or correspondence between things which is supposed to be necessary for the upholding of the world. Nature, Destiny, Fate (or whatever name we give to a power we cannot understand) appears to have cast such beings into the world with no more regard for their value or precautions for their growth than was used by the sower when he let seed fall by the wayside, upon the hard stones or among the thorns. One of the most puzzling of those cases, in which genius appears to be of as little value as the grain which the birds of the air carried off, is that of ALFRED STEVENS. Considering the marvellous extent of his capacity, and the little use he was permitted to make of it, he must be classed among the failures; in spite of all the fertility with which he was endowed, he was not destined to follow the natural law and display himself in sufficient amplitude. Yet hereafter, when he can be judged at a proper distance, it is likely to be said that STEVENS was precisely the one artist that was most needed in England in this nineteenth century, and, if rightly appreciated, his appearance was as a blessing to the land. He came among the people he was to enlighten and delight, and, as often happened before with similar precursors, he was rejected. As he must have felt that he was not as other men, is it to be wondered that he should sometimes lose confidence in his powers when he found he was unable to win the approval which was lavished on artists who were so much inferior to himself?

The peculiarity of STEVENS's gifts increased his misery. A man who is born with great power of expression need not be silent until he can control a senate or command a theatre. He can convey his thoughts in the form of a sonnet or a song ; he can make a few pages immortal ; and if books are unknown he can become a rhapsodist and thrill the market-place, or he can go into the desert and, were he frail as a reed shaken by the wind, it will be found that men will follow to listen to him. An ordinary painter or sculptor also can discover many ways to entice support from individuals who commonly are indifferent to everything that relates to art. STEVENS, on the other hand, was never intended by nature to minister to the luxury of one man or a few. For a society properly constituted he was essentially the artist who could express in stone or metal or other enduring medium the thoughts and aspirations that were general; he could become a creator of public memorials, a bestower of fame; and he would be treasured as a sympathetic man in whom nothing was circumscribed, and who could display his justice in imparting beauty to the smallest as to the largest things. STEVENS was such an artist as the American desired for the new city, one who would—

> Give to barrows, trays and pans
> Grace and glimmer of romance ;
> Bring the moonlight into noon
> Hid in gleaming piles of stone ;
> On the city's paved street
> Plant gardens lined with lilac sweet ;
> Let spouting fountains cool the air,
> Singing in the sun-baked square ;
> Let statue, picture, park and hall,
> Ballad, flag and festival,
> The past restore, the day adorn
> And make to-morrow a new morn.

For work so various STEVENS was adequate. To his mind there was only one art, but it comprised every way in which beauty could be imparted to form. Supply him with materials and a great theme, one that would interest humanity rather than parishes and coteries, he could produce a masterpiece, but compel him to go into the market and sell his art, STEVENS became the weakest of mortals. He might be penniless, but could not haggle, and the conditions under which buying and selling have to be carried out, no matter how sounding may be the terms used to describe them, were to him, in connection with a work of art, as much a sacrilege as trafficking in a temple. Everything appeared sordid which in any way affected his idealism or narrowed the sphere of his thought, and, as he imagined, gave a material character to his art. His indifference to gain made people think he was not qualified to be trusted with important works. There is no room in England for men who are not adapted to become units in a crowd or parts of a great industrial machine, and in consequence STEVENS, who was one of the rarest of spirits, who was endowed with natural gifts beyond any of his contemporaries, and for whom art retained much that recalled its divine origin, was tested by the rules that are most applicable to tradesmen. We may be all thankful that he did not correspond with them, but in a country where the maxims of business are omnipotent, it is no wonder he was set aside like an unqualified practitioner.

A judgment obtained under such circumstances, and which is thoroughly British in conception, is not easily reversed. When people think of STEVENS he appears before them as a very weak mortal whose imagination was greater than his executive power, who was wanting in system, and therefore caused trouble to many deserving people, as a man who had only partially and by accident gained a rather prominent position which he was incompetent to hold. Mr. HUGH STANNUS, one of the most prominent of STEVENS's pupils, through whose devotedness and talents the artist was protected and aided in his last years, has at length succeeded, after years of loyal endeavour, in bringing together the materials which are best adapted to convince Englishmen of the unsoundness of the fallacies on which their opinion of STEVENS is based. Through the goodwill and liberality of the Autotype Company a volume has been produced which forms as becoming a memorial of the artist as his most ardent admirers could desire. The selection from STEVENS's works, forming the subjects of the plates, will convince the most sceptical of his genius, and the strength and elasticity it acquired by long years of self-imposed discipline. Mr. STANNUS's memoir follows the course of the artist's life from year to year, and reveals much which hitherto was unknown to the public. He must be unfairly prejudiced who, after reading what is said by Mr. STANNUS, is not able to understand the character of the artist, and to make allowance for defects which arose from the monopolising influence of his art.

Mr. STANNUS, in describing some of STEVENS's characteristics, wisely says, "'A mere copyist of MICHEL ANGELO,' he has been sometimes termed. This exhibits a failure to apprehend the law of evolution. MICHELAGNOLO was not the end of everything, but a link—a step in the procession. Undoubtedly, without that of the Florentine, the work of STEVENS would have been less or later ; each great man, as every small one, is the result of every great man before him ; but while the small man can only follow the light that shows the path, each great man, in succession replenishing the lamp, causes it to shine more brightly through the centuries. So with the master, and we may be glad and grateful that to our English-speaking race, in this happy reign, has been granted among other advantages the influence of ALFRED STEVENS." There is no error in thus making STEVENS one of the light bringers of humanity, nor is it presumptuous to suppose that he was strong enough to uphold the lamp that was borne by the mighty hand of the Florentine. The fact is, STEVENS could not have succeeded even within the limits imposed on him if he did not possess a strength that was exceptional.

He was born in 1818 in the little town of Blandford Forum, in Dorset, which is one of the last places where one would seek for a successor of MICHEL ANGELO. His father was a house-painter and decorator, his mother a farmer's daughter. Young STEVENS was taught in the local school, but before he was eleven he was obliged to help his father. He was fond of copying pictures and engravings in those early days. One, taken from the print of the *Storming of Seringapatam*, was rescued from a public-house, where the father had left it in settlement of a drink score. Everything indicated that STEVENS was destined to resemble a great many youths in country towns, and to be no more than an useful operative who would be competent to aid in local work. But fortunately the boy was not disposed to accept life under such conditions.

* *Alfred Stevens and his Work.* Being a collection of fifty-seven autotypes, with a brief memoir and account of his principal works so far as they are known. By Hugh Stannus. London : The Autotype Company.

The rector of a neighbouring parish, the Hon. and Rev. SAMUEL BEST, happened to see STEVENS's copies, and lent him pictures, which were better than engravings as exemplars. An effort was made to obtain training for him under an artist. LANDSEER, however, wanted 500*l.*, and as only 60*l.* could be raised, it was decided to send STEVENS to Italy, where he might attain perfection by copying the works of SALVATOR ROSA! Let us remember that the arrangements were made in 1833, when everything relating to art was supposed to be a mystery, and it will not therefore surprise us if the transaction reads like a chapter from the "Vicar of Wakefield."

It did not take long before STEVENS perceived that the Dorsetshire connoisseurs were not wise in their admiration of the Savage ROSA, and in Naples he was first impressed by the grace seen in the works of ANDREA DEL SARTO, and then he worked hard in copying examples of other schools. In Pompeii he was able to see beautiful decoration, and his first year was profitably spent. But Rome was the goal of the enthusiast. He tramped the long road "with such help as a lift on a vetturino afforded, and staying at wayside locande, where he made portraits in pencil with colour washed over (to fix the pencil and give a little tint) for his lodging." At a time when everybody was conspiring, he could hardly escape being made a dupe of crafty men. It seems probable that, like many others, he was disappointed when he reached Rome, for after a short time he turned his steps toward Florence. There he spent three years with profit. He copied old masters for a living, and discovered many a secret in the work. He was tolerated as a sort of unattached student, who had ways of his own. That he inspired confidence is evident, for we are told by Mr. STANNUS that "when the French workmen made their plaster moulds from the Ghiberti Gates, by permission of the Austrian Government, the boy acted as representative of the latter." Young as he was, he was strong enough to resist the fascinations of any master, living or dead. Wherever there was good work to be found he sought it, and earnestly tried to enter into its spirit. His copies from TITIAN's pictures in Venice were so much akin to the originals that some have supposed he passed off old Italian copies as his own. He studied ornament under ALBERTOLLI at Milan, but the lessons only served to develop his own manner. He was employed as an assistant by THORWALDSEN, and expressed himself as grateful to the Danish sculptor, but however he might admire his classicism, STEVENS was not to be induced to forego the methods and the spirit which in some mysterious way he appeared to inherit from the artists of the Renaissance.

For it could be said of STEVENS that he came nearer to an ideal completeness than any one of the great men of the fifteenth or sixteenth century. There was to be found in him something that recalled MICHEL ANGELO, TITIAN, BENVENUTO and PALLADIO, besides qualities that they did not possess. He was no representative of one school or period, but rather an artist to whose strength Italy in its fulness had contributed. The misfortune was that he had done so little with a view to the actualities of life. The same simplicity which disregarded cause and effect by the selection of SALVATOR ROSA as a guide followed STEVENS during his course. He sought bravely after power, and he succeeded in making himself competent to undertake commissions for painting, sculpture, architecture or whatever variety of art was needed, for to him art was only a sort of universal language which he had mastered in all its parts; but this surprising force had to be taken on trust. He brought with him nothing that was marketable. He acted as if his business was to become competent, and the rest was to be undertaken by providence. The old race of English patrons that benefited men like himself during their travels was extinct, and when, after his seven years of exile, he landed at Southampton, he was as much of a stranger and as poor as when he left. There were no offers awaiting him, and he was compelled to borrow the small sum that was necessary to transport him to Blandford. All his intercourse with Italians had not taught him worldly wisdom; he found himself less useful among his countrymen than among strangers, and for a time it seemed as if art was only an illusion by which he was to be led astray.

What so sensitive a genius must have suffered in the little room of the humble house at Blandford can only be guessed. "He is described," says Mr. STANNUS, "as being at this time very reserved, though courteous to his few intimates, and as not joining in any of their country sports. He stayed indoors all the day, coming out in the evenings." It soon became evident that the most weary days and nights, if passed in Blandford, could not help him to commissions. He was fortunate in finding a friend who lent him his savings, amounting to 40*l.*, and with that help he found his way to London in the beginning of 1844. The time was considered as opportune. A new era for artists like STEVENS appeared to be opening. The walls of the Houses of Parliament were to be decorated, and from all that was said on the subject it might easily be imagined that it was the bounden duty of loyal citizens to make fresco supersede wall-paper in public and private buildings. STEVENS exhibited a specimen of fresco-painting. He began a picture of the *Brazen Serpent*, and another having for subject an incident in the life of FRANCESCO MAZZUOLI, which, with other things, show that he did his best to prove he was a man for the time; but nothing came of all his efforts. He suffered much misery, and at length was glad to accept an appointment in the School of Design at Somerset House, his salary being 150*l.* a year.

He had the quality of qualities for such an office, for his worth was manifest to the keen-eyed students. They could see the giant was compelled to drudge, and yet bore his suffering meekly. They found that an observation from him was worth a course of lectures from others. But the school was admittedly an experiment, and as the whims of Government clerks were the moving power, hardly a week passed without a change. A prejudice against the English circumlocutory system was bred in STEVENS's mind while he was in Somerset House, and in after days it helped to increase the friction in his dealings with Government officials. Like all men who prefer art to their own interest, he was an inspiring master, but after two years' experience of clerks as controllers STEVENS was compelled to abandon the school and to seek an income in other ways.

By slow degrees he was able to persuade a few people that modesty and merit could go together. Sir ROBERT PEEL gave STEVENS a commission for decorative work, and a sketch of part in the volume might be taken as a design by RAPHAEL. He worked at the panels of the Fitzwilliam Museum under COCKERELL, but "nothing now remains which could have been done by him." He painted some panels at the mansion of the BLUNDELLS near Liverpool. Mr. STANNUS says they were executed in less than one day each; "they were sketched on the walls in red chalk, and thinly painted in PARRIS's medium, without models of any kind, which latter fact may account for the peculiarity of the crination; they have the same quality, of quick unerring work, as the Attic vases, and may be judged by the same canons." He designed a railway carriage for the King of DENMARK. From COCKERELL's suggestions he made a drawing of the sculpture for St. George's Hall, which could hardly be surpassed as a specimen of delicate brush-work.

His most important commission after leaving Somerset House was for the gates of the Geological Museum, which unhappily came to nothing through over-eagerness to justify his selection. Mr. STANNUS says of this work:—"Had this noble design been carried out, the world would possess a model in the art of relief; but, alas! through no fault of the authorities, this is not so. He had received the commission in 1846, and shortly afterwards an instalment on account, and his intention was, when engaged, to go to Sheffield to model the panels in his leisure, and have them cast at the foundry, but owing to his fastidious taste and besetting procrastination this intention went where so many others have gone before and since, and the design exists only in the beautiful drawing at South Kensington."

The mention of Sheffield suggests one of the most fruitful periods of STEVENS's life. In 1850 there was preparation for the universal contest in Hyde Park. He was persuaded to give his aid to Messrs. HOOLE, of Sheffield, stove-makers, and with the aid of his assistants, Mr. HOYLES, Mr. SYKES and Mr. TOWNROE, he produced designs which were "astounding for the time," and "caused a new development in bronze and iron." STEVENS's treat-

ment was an innovation, for, says Mr. Stannus, "he introduced into English manufacture the method of placing plates of bright brass behind castings in grey iron, thus adding colour and emphasising the beautiful relation between the ornament and the interstices in which he was unapproachable. The practice of parti-colouring in modern English work was reintroduced by him. A development of his mind is to be observed in their succession from the more architectural forms introduced into the former to the freer style of the later stove fronts, but the whole are admirable in the restraints they evince." Mr. Stannus's wide experience in production enables him to point out with exactitude the worth of Stevens's co-operation with manufacturers. There is much more relating to the technical work of the designs which we should like to copy, but we have already, we fear, exceeded equitable bounds. Stevens's power in Sheffield manufactures is not to be measured by the profit derived from his designs. It is a matter of history that in the art school he renewed the fascination which was proved at Somerset House. Mr. Stannus says that "though he had no official connection with it, Stevens often went and gave words of counsel and encouragement to such of the elder students as seemed desirous of learning. He had a quick, piercing eye, and a most winning smile, and the sweetness of his voice and manner had great influence over them."

The works after Stevens's designs upheld the reputation of England in the Exhibition of 1851. They proved that what the country wanted was not manual skill, but the co-operation of artists whose designs did not require manipulation by unworthy hands. Stevens from the first would not allow himself to be fettered, and the manufacturers gained by accommodating themselves to him. But it was not always easy to convince men of the advantage of the arrangement. We are persuaded that much of the unhappiness of Stevens's life arose from the conviction that the relations between modern industrialism and art resolved themselves into a sort of game of give-and-take, in which a man like himself was likely to lose all individuality. He could not produce designs and be indifferent to the freedom used in adapting them. He became testy, delayed drawings as if to prevent any operations on them by other hands, and met statements of the inconvenience he was causing by saying, "If I do the work I must do it in my own way and at my own time." Stevens, with all the readiness he derived from the study of examples, was also a believer in inspiration. He was competent to design things on the spur of the moment, but he knew that in some mysterious way forms suddenly arise in thought which are better or give more pleasure in realising than those which are created by system. He was eager for the sake of art to give the best, and therefore was to be excused when he did not display the promptitude of a machine. So much fastidiousness could not be understood at a time when art was supposed to gain much from its alliance with manufacturers, that is, with machinery, and the work obtained by Stevens in the years which followed the Great Exhibition was not commensurate with his success in the contest. In Mr. Stannus's account the unexecuted designs predominate.

The competition for the Wellington Monument in 1857 offered to him the first opportunity in which he could display all his strength, and he entered into it with an earnest heart. During the eight months of preparation "he was often at the board or the banker till past midnight, and up again at daylight to resume." However, owing to his earnestness to attain perfection, it was only at the last prescribed moment that his model reached Westminster Hall. In the first competition he was rewarded with one of the five prizes of a hundred pounds each, but the judges candidly confessed they did not consider the fitness of the models for the site proposed. Afterwards a model of the arch was made and applied to each of the premiated designs, when it was discovered that Stevens's alone was suitable to the site. In consequence, he was entrusted with the commission.

What followed is one of the saddest stories in the history of art. It is often supposed that all the suffering which Stevens was compelled to endure should be attributed to official meddling. But Mr. Stannus, who knows more of the circumstances than any other man, declares that the Prime Minister, the Chancellor of the Exchequer, and even the First Commissioner, "were all friendly and considerate towards the master." He continues:—"Much has been written about persecution of the sensitive artist. He did, indeed, writhe under the hydra-like difficulties which commenced with the trial model. But, if there were loss of time and money, the responsibility may fairly be attributed to the unintentionally hard initial stipulation, incautiously agreed to and expensively carried out by the sanguine artist, as much as by the blundering good intentions of the Government official who sought the efficiency of the public service." That is an impartial view of the case, and should determine it for ever.

Stevens was too absorbed by his art to devote any attention to other interests, although they were vital to himself. He saw what appeared to be a large sum of money at his disposal; his own requirements were modest, and it seemed to him that after all expenses were paid there must be a surplus. He believed that the amount was fixed by experts with more experience than himself, and it did not strike him until it was too late that originally there was no intention of providing a most costly model, which was only proposed as a measure of security against himself. It was Stevens's desire to make the monument worthy of Wellington and of England, and the very excess of his eagerness caused him to look too precisely at details. The most ardent admirers of the artist must admit disappointment every time they contemplate the work. Even Mr. Stannus is compelled to see the shortcomings, and however painful to himself may be the task of appearing as the improver of the work of such a artist for the sake of Stevens's memory, he suggests alterations, which he says if the trial model had been placed in the Cathedral would have commended themselves to the master's judgment. The monument suffers under the drawbacks of being incomplete, for it is shorn of its most important feature, the equestrian statue, and of being placed in a position where it cannot be properly studied; but the authorities would also do well to attend to Mr. Stannus's suggestion for a rearrangement of some of the parts.

Another example of Stevens's sculpture is seen in the chimneypiece of Dorchester House. The figures appear as if he wrought in emulation with Michel Angelo, and, as may be said of all noble sculpture, the lines are an inexhaustible study. In the owner, Mr. Holford, the artist found the most forbearing of patrons, but, although there seemed to be no limit to the allowances he was prepared to make for the waywardness of genius, he was compelled, after waiting for years, to put up with work that was incomplete. Stevens's life suggests the sad reflection that nature sometimes creates men who are destined to be imperfect unless they are controlled; left to themselves their days and works become only fragments.

But with all the shortcomings of Stevens's life, what a legacy has he left to his country! In the splendid plates which are found in the volume that is devoted to his memory, we can see not only a record of his most complete work, but of designs in which the longing of his mind for beauty of line and composition is manifest. There is work shown which might be described in the words of Shakespeare, that are expressive of so much in Renaissance art, "So lovely fair that the sense aches at it." And so many of the designs, too, excite our pathos, for we know that with all his aspirations and striving they were not destined to be matured, but were to remain for ever as if they were only shadows cast by glorious forms on paper. Happily, Mr. Bird and the Autotype Company have given them some permanence.

This volume is no ordinary example of enterprise; if profit only were considered it would never see the light. The more credit is therefore owing to those who have taken part in its production. It may not be possible for all students of art to acquire it, but we should like to see them subscribing in order that all the principal art schools in the country should be enriched with a copy, and in that way the influence of Stevens would be extended beyond the present time. Amateurs will need no recommendation to obtain copies. Both students and amateurs must acknowledge their indebtedness to Mr. Stannus, who has so reverentially and earnestly guarded the reputation of the master he faithfully served during life.

THE METROPOLITAN BUILDING ACT.

ONE section of the annual report of the London County Council deals with the work of the Building Committee. It states that the committee has held forty-one ordinary meetings during the year, twelve sub-committee meetings, and during the vacations three meetings, with special powers. The following statement is designed to show in popular form the position of the law, both before and after the amendment of the Building Act :—

The number of plans approved by the Council under the provisions of the Metropolitan Building Act is very large. Previously to the new Act being passed, the approval of every such plan had to be signed by the chairman of the London County Council. Provision is now made for plans and particulars of buildings being signed by the chairman of the Building Act Committee or by some other person to be appointed for that purpose by the Council.

By the 75th section of the Metropolis Management Amendment Act, 1862, the superintending architect of the Council for the time being is empowered to determine the general line of buildings in any street in the county, and it had been decided by the House of Lords that there was no appeal from his decision. This state of things was felt to be anomalous, and to be likely to occasion discontent. Any persons dissatisfied with the decision of the superintending architect in regard to the general line of buildings can now appeal to a tribunal to be constituted as provided by this section, viz. one member to be appointed by the Council, one member to be appointed by the Council of the Royal Institute of British Architects and one member to be appointed by the Council of the Surveyors' Institution.

Buildings to be used as warehouses, or for trade or manufacturing purposes, could not be erected of greater dimensions than 216,000 cubic feet without party walls, except as regards certain manufactories for machinery and boilers of steam vessels. This was found to be unduly restrictive, as the exigencies of modern trade necessitate in many cases the erection of larger buildings. Authority is given to the Council by this section to permit in certain cases, and subject to the adoption of special safeguards against the danger from fire, the use of buildings of greater dimensions than 216,000 cubic feet, but not exceeding 450,000 cubic feet, without being divided by party walls.

The rules as to the distance at which every building should be placed from the "centre of the roadway" of the road in front of the same led to anomalies and inconveniences owing to there being no definition of the expression "centre of the roadway." Thus, when buildings were erected on one side of a roadway, say 30 feet wide, they had to be set back 5 feet (so as to be 20 feet from the centre). The boundary of the roadway would then be on the one side 20 feet, and on the other side 15 feet from the old centre line, and the actual centre would have become 17½ feet distant from the boundary on each side, instead of 15 feet, as it was at the time when the opposite buildings were erected. The owner of the building land on the opposite side of the road could then comply with the law by widening the roadway to an extent of 2½ feet only instead of 5 feet, as had been done by the owner who first built. This provision not only led to unfairness as between opposite owners, but also failed to effect the real intention of the Act, viz. that streets should be at least 40 feet wide throughout. The new section is designed to remedy these inconveniences by enabling the Council to fix once for all the line constituting the centre of the roadway, and to prevent new buildings or the forecourt boundaries of the same being placed within 20 feet of that centre on either side of the road.

No adequate power was possessed by the Council of making by-laws for sanitary purposes in connection with buildings, and whilst the Council and their predecessors, the Metropolitan Board of Works, could make regulations in regard to the mortar to be used in the construction of the walls of buildings so as to secure its being of wholesome and proper quality, the Act did not permit of the Council exercising any control with regard to plastering, and complaints were frequently made of improper materials being used for plastering which the Council had no power to prevent. A further difficulty was experienced in consequence of the inability of the Council to prevent excavations in close proximity to buildings being filled up with insanitary refuse.

The Council is empowered by this clause to make by-laws as to—1. The description and quality of the substances of which plastering is authorised to be made. 2. The mode in which and the materials with which any excavation made within a line drawn outside the site of a house, building, or other erection, and at a uniform distance therefrom of 3 feet shall be filled up. 3. The duties of district surveyors in relation to such plastering or excavation, and the regulation of the amounts of the fees to be paid to such district surveyors in respect of the duties imposed upon them by any such by-laws.

No adequate provision has hitherto been made for securing the erection of hoardings and platforms for the protection of the public in cases where buildings abutting on public thoroughfares were being demolished. The new clause will necessitate the erection of proper hoards, fences, platforms and handrails before any building within 10 feet of a public thoroughfare can either be built or taken down.

Questions have frequently arisen under the existing enactments, and these questions have in several cases been discussed at considerable length in the courts as to whether a building at the corner of two streets should follow the general line of buildings in the street other than that in which the building was situate. To set these questions at rest, and to prevent the disfigurement which is now occasioned through buildings on corner plots being placed in advance of the general line of buildings in side streets, the Council has obtained power to control the main and side frontage of buildings so situate in streets hereafter to be formed. Although the exercise of the power conferred by this section is subject to restrictions, it is hoped that the observance of the general line of buildings in such cases will be secured. This section was considerably weakened by the action of the Royal Institute of British Architects.

Although new buildings could not be placed at a less distance than 20 feet from the centre of a public carriageway, or 10 feet from the centre of a public footway, it was doubtful whether the extension of buildings so situate could be prevented. This clause is intended to remove all further doubts as to the illegality of extending any building, so that any part of the external wall of such extension shall be within 20 feet of the centre of a public carriageway or 10 feet from the centre of a public footway.

The law intended to secure the free and open intercommunication of streets was liable to evasion owing to the definition of the term "street" in the existing enactments, which includes any road or passage, whether a thoroughfare or not. Streets therefore could be formed which were not available for through vehicular traffic, as they might communicate at one end with a street of the statutory width and at the other with a narrow passage-way only. The new enactment will prevent streets being thus laid out unless with the consent of the Council.

The Metropolitan Building Act contains no limitation as to the height to which buildings in the county of London may be erected, and special attention was directed to the subject in consequence of the great height to which certain buildings had been carried. It was felt that buildings could not be so carried up without damage to adjoining buildings, and that the danger in case of fire was thereby greatly increased. The new enactment was strongly opposed on behalf of some of the large estate-owners in the county, and, to the surprise of your committee, by the Royal Institute of British Architects ; but, in spite of this opposition, a usefully restrictive clause has been passed. It does not, however, give the Council quite so much control as your committee had thought desirable ; at the same time the enactment will prevent the erection, without the consent of the Council, of buildings of an excessive height.

The Treasury first required that all Crown property and buildings occupied by Government departments should be exempt from the provisions of the Act. The section, however, as passed, exempts Crown and Government buildings vested in and occupied by Government departments only, but it does not exempt ordinary houses built on Government property. The committee has already found the value of the above amendments in the law in a large number of cases.

District Surveyors.

For the purposes of the Building Acts, the metropolis is now divided into seventy-four districts, each superintended by a district surveyor, whose duty it is to see that all erections and all additions and alterations to buildings are carried out in accordance with the law.

The following is a summary of the monthly returns of district surveyors for the year ended December 1890 :—

Works.	Building operations.	Fees.
New buildings in respect of which fees were received	6,618	£15,449 15 2
Additions and alterations and other works in respect of which fees were received	11,494	15,077 0 4
Arrears—		
New buildings	2,152	5,101 8 10
Additions and alterations	2,111	2,808 10 6
Total works and fees thereon during the year ended December 1890	22,375	£38,436 14 10

The committee submitted the following regulations with respect to new appointments of district surveyors, and they were approved by the Council :—No person shall be accepted as a candidate for the appointment of district surveyor unless he shall have attained twenty-eight years of age and be under fifty

years of age, and every such candidate shall deliver with his application satisfactory evidence of his age. Every candidate shall be required to sign a declaration and deliver it with his application that he becomes a candidate and will accept the appointment if he should be appointed, on the following understanding:—(*a*) That he will personally discharge the duties of his office subject to section 35 of the Metropolitan Building Act, 1855. (*b*) That he will give his whole time to the duties of his office. (*c*) That he will not during his continuance in office (except in the discharge of the duties thereof) carry on business as an architect, surveyor or builder, or directly or indirectly as a partner or otherwise be interested in such business. (*d*) That he will furnish the Council with information of those cases in his district in which the orders of the Council or the requirements of the Metropolis Local Management Acts with regard to the width of streets, or to any building, structure or erection or projection therein beyond the general line of buildings are not complied with. (*e*) That he will make no claim for compensation in case a diminution of his income shall at any time hereafter arise. (*f*) That he will keep his district office open from Monday to Friday (both inclusive) between the hours of 9.30 A.M. and 5 P.M., and on Saturday from 9.30 A.M. until 2 P.M., and give his personal attendance there daily from 9.30 A.M. to 11 A.M., and (except Saturday) from 4 to 5 P.M. (*g*) That he will retire if required to do so on attaining the age of sixty-five, or at any date subsequent to his attaining that age. The declaration of the appointed candidate shall on his appointment be entered on the minutes of the Council. The districts are to be rearranged by the committee as opportunities may occur, so that the average of the fees received may in no case amount to less than £500 per annum.

Formation of Streets.

The duty of regulating the width of roads, streets and pas sages devolves upon the Council under the provisions of the Metropolis Management Amendment Act, 1862, Sections 98, 99 and 112, and the Metropolis Management and Building Acts Amendment Act, 1882, Sections 6, 7 and 8. A width of 40 feet is required for streets intended for carriage traffic, and 20 feet for footways. The Amendment Act of 1878 forbids the erection of any building, without the written consent of the Council, in such a position that its external wall or forecourt boundary shall be within 20 feet of the centre of a carriageway or 10 feet of the centre of a footway. Applications were received for approval of 109 plans for the formation of new streets, of which 43 were granted. For consent to the erection of buildings at less than the prescribed distance from the centre of the road 33 applications were received, of which 10 were granted. The total length of the new streets sanctioned by the Council during the year exceeds 12 miles.

Lines of Frontage.

The consent of the Council is required under the 75th Sec tion of the Metropolis Management Amendment Act, 1862, fo the erection of any building beyond the general line of frontage in any street or row of houses within 50 feet from the highway. The 26th Section of the Metropolitan Building Act, 1855, also renders the previous consent of the Council necessary in cases where it is proposed to construct porticoes, balconies or verandahs. The Council has during the past twelve months received 365 applications for the erection of buildings beyond the general line, of which 184 were granted. For the construction of porticoes, balconies and verandahs 188 applications were received, of which 141 were granted.

The committee, in its recommendations as to bay windows, balconies, &c., and the use of external woodwork, has endeavoured, with a due regard to the public safety and convenience, to interfere as little as possible with the architectural character of the proposed buildings. In case of question the general line of buildings in a street must be decided by the superintending architect appointed by the Council under the Building Act, subject to appeal under section 28 of the London Council (General Powers) Act, 1890. Thirty-four decisions were given by the architect under the 75th section of the Act of 1862 during the year.

Special Buildings.

The Council has authority under the 56th section of the Building Act, 1855, to sanction special erections to which the rules in the Act may be inapplicable. The Council is also empowered to control the erection of movable and temporary buildings or structures, and to limit the time for the use of the same under the 12th and 13th sections of the Metropolis Management and Building Acts Amendment Act, 1882. During the year the following cases have been dealt with:—1. For iron buildings constructed for temporary and other purposes 52 applications were granted and 33 refused. 2. For wooden buildings 32 applications were granted and 11 refused. 3. For the continuance of temporary buildings 102 applications were granted. 4. For open sheds and drying sheds 18 applications were granted and 4 refused. 5. For warehouses and other buildings with large openings 2 applications were refused. 6. For furnace chimney-shafts for breweries, distilleries and other buildings used for manufacturing purposes 57 applications were granted and 15 refused. 7. For overhanging eaves to dwelling-houses and other roof constructions 10 applications were granted and 1 refused. 8. For covered ways, projecting water-closets and other rear projections 16 applications were granted and 11 refused.

Naming of Streets and Numbering of Houses.

The Council is empowered by Section 87 of the Metropolis Management Amendment Act, 1862, to give names to new streets, to alter the existing names and to renumber houses within the metropolis. A survey of the locality is always made and a plan prepared showing the situation and number or name of each house for future reference and identification of the property. During the year the Council has abolished 468 subsidiary and other names of streets, and rearranged the numbers of 9,362 houses; it has also approved of 85 names of new streets and ordered the renaming or renumbering of 259 streets.

The duty of carrying out the orders of the Council devolves upon the vestries and district boards. By the 5th section of the Metropolis Management and Building Acts Amendment Act, 1882, the Council is empowered, in case of default by any vestry or district board, itself to carry out the orders at the expiration of three calendar months. A register of alterations is kept, and extracts are supplied for legal and other purposes; 1,054 certificates were issued during the year. A return of alterations in street nomenclature and house-numbering has been printed to December 1890.

Neglected Structures.

By the 17th section of the Metropolis Management and Building Acts Amendment Act, 1882, it is provided that where a structure is ruinous, or so far dilapidated as thereby to have become unfit for use or occupation, or is from neglect otherwise in a structural condition prejudicial to the property in or to the inhabitants of the neighbourhood, the Council may make complaint thereof to a magistrate; and should such complaint be substantiated, the magistrate may order the owner to take down or repair the neglected structure to the satisfaction of the Council. In pursuance of the power so vested in the Council, 272 houses have been inspected and reported upon during the year. In the majority of these cases the necessary works were carried out by the owners upon receipt of notice of the Council's requirements, but in 137 instances it was necessary to take proceedings before a magistrate.

Dangerous Structures.

2,656 cases of dangerous structures from fire and other causes have been reported during the year. In consequence of the failure of owners to comply with the requisition of the Council's notices, 566 summonses were issued and attended by the solicitor during the year. Provision is made by the 80th section of the Metropolitan Building Act for the removal of the inmates from a structure certified by a competent surveyor to be dangerous to them; and in twelve cases it was necessary to enforce the provision and close the premises until the structure had been rendered safe. The Council's jurisdiction with respect to dangerous structures does not extend to the City of London. In the City the jurisdiction is vested in the Commissioners of Sewers, but it rests with the Council to allow the fees charged for inspection and survey. During the year seventy-eight accounts have been received from the Commissioners of Sewers for the inspection and survey of buildings in the City of London, reported to be in a dangerous state, on which, after examination, the usual fees have been allowed.

THE BRITISH MUSEUM.

THE annual report which has just been presented by the trustees shows that the number of visitors to the British Museum during the daytime has seriously decreased during the past year, the total being only 463,833. The grand total is, however, raised to 530,172, by the additional number of 66,339 persons who visited the Museum in the evenings between the hours of eight and ten P.M. The average daily number of visitors in the daytime was 1,491; that of visitors in the evening was 242. The number of persons making use of the reading-room has continued to increase, the total visits in 1890 being 197,823. The number of volumes supplied to readers was 1,226,126. Mr. E. M. Thompson, the principal librarian and secretary, gives a list of the chief donations to the Museum during the year. These include:—From Lord Savile, an archaic terra-cotta antefix, from Lanuvium; from the Earl of Derby, a choice series of stone and flint implements from Denmark, &c.; from the Earl of Lonsdale, a large ethnographical collection from North-West and Arctic America; from the Hon. Robert Meade, choice specimens of Chinese egg-shell and other porcelain; from Lady Charlotte Schreiber, watches and Mediæval antiquities; and from Mr. A. W. Franks, specimens

of porcelain of different countries, in augmentation of the Franks collection, and various antiquities.

The past year, says the report of Mr. R. Garnett, has been remarkable for acquisitions of celebrated bibles, including the Egenolff German Bible, Frankfort, 1534, of great rarity, and especially interesting from being adorned with the woodcuts from which the illustrations of the Coverdale Bible of 1535 were imitated; and the Acts and canonical epistles, and the Psalter, translated into White Russian, and printed at Wilna in 1525. With the exception of some portions of the Old Testament previously published by Skorina at Prague, and perhaps a version of St. Luke, these are the first translations of the Scriptures into Russian; they are also the first Russian books printed within the present limits of the Empire. To these are to be added an unique copy of an edition of Calvin's New Testament, printed at Geneva in 1551; a vellum copy, unique in this state, of Luther's translation of the Psalms, Leipsic, 1540; the New Testament in the Ober Egandine dialect of Romansch, 1560; the Malagasy Bible, Antananarivo, 1830-35, perfect copies of which are exceedingly scarce, the greater part of the impression having been destroyed in the persecution, and the few copies which escaped having been divided into small portions for more effectual concealment; Daniel Elzevir's family bible, with entries of births, marriages and deaths, on large paper, and splendidly bound by Magnus: Coverdale's version of the Psalms, printed by James Nycolson before 1538; his New Testament, probably printed about the same time; and "The Bokés of Solomon," including Wisdom and Ecclesiasticus, printed by William Copland in 1550. The Psalter is unique.

In English literature the fortunate acquisition of William Blake's first work, the "Poetical Sketches," 1783, has made good one of the most mortifying deficiencies in the library, pointed out as such by Blake's biographer Gilchrist nearly thirty years ago, but, from the excessive rarity of the book, never remedied till now. A similar acquisition has been made in a complete copy of the *Gownsman*, one of the two magazines conducted by Thackeray when an undergraduate at Cambridge; its companion, the *Snob*, has long been in the Museum. Rarer still are complete sets of the *Mite*, *Elf* and *Fairy*, miniature magazines chiefly written by Sir A. Panizzi and Lord Langdale, and printed at the latter's private press at Roehampton. Only two such sets are believed to exist; the one now obtained was Lord Langdale's own, and has a MS. key in his handwriting. Interesting acquisitions of like character are the original edition of Gibbon's "Mémoire Justificatif" for Great Britain against France in the American war, and the first edition of Emerson's "Nature," Boston, 1836. There is also one of the only two known copies of Bunyan's metrical "Discourse of the Building of the House of God," 1688. This copy was believed to have been destroyed at the burning of Mr. Offor's library, more than twenty years ago, and has only recently been discovered comparatively uninjured on an examination of the salvage. At the same time was purchased a Belfast edition of another of Bunyan's works, "Sighs from Hell," 1700, so far as known unique in this edition, which is also the first book actually ascertained to have been printed at Belfast.

Among numerous curiosities the most remarkable is a Chinese bank-note of the Ming dynasty, about 1368, a comparatively modern specimen for China, but three hundred years older than the first bank-note issued in Europe. No example of any other early issue is known to exist. With this may be mentioned Dutch treaties with Malay sovereigns, printed at Batavia in 1668, and Dutch and English newspapers printed at the Cape of Good Hope in 1804 and 1805—nearly the first examples of printing in these colonies; a benevolence or letter requiring a loan, addressed to a subject of James I., 1604—an application common enough in MS., but almost unknown in print.

Included with the donations is a beautiful edition of the musical compositions of Frederick the Great, presented by the German Emperor. The other chief additions to the collection of music have been a copy of the "Delphin de Musica," by Luis de Narbaez, printed at Valladolid in 1538—a book of the utmost rarity; a number of rare part-books of madrigals, canzonets, &c., published at Venice between 1596 and 1608; and a collection of 137 musical works, mostly printed in this country in the seventeenth and eighteenth centuries, which includes the scarce first edition of "Parthenia, or the Maydenhead of the first musick that ever was printed for the Virginalls," generally considered to be the first music printed from copperplates in England.

Out of the grants for the last two financial years an important series of antiquities has been purchased from the Earl of Carlisle, and divided between the Department of Greek and Roman Antiquities and the Department of British and Mediæval Antiquities and Ethnography. The collection of engraved gems, which forms the most important part of the purchase, was made by Henry Howard, fourth Earl of Carlisle (1694-1758). A letter of Horace Walpole to Richard West, written from Rome, May 7, 1740, describes the manner in which a part of the collection was acquired. The gems in the Carlisle collection are known to have belonged to Cardinal Ottoboni. According to the report of Mr. A. W. Franks and Mr. A. S. Murray, the collection is of importance, not only on account of its fine cameos and intaglios of undoubted authenticity, but also because it contains several specimens with reputed artists' signatures which have been the subject of controversy among archæologists.

THE VICTORIA COURTS, BIRMINGHAM.

THE Victoria Courts have been built by the Corporation of Birmingham, in accordance with an undertaking to provide assize courts when an assize was granted to Birmingham. The building was at first intended to contain the assize courts only, but the scheme grew, and it was decided to give up the present police-courts in Moor Street, and house them also in the new building. From the commencement Sir Thomas Martineau, a leading solicitor in Birmingham, actively interested himself in the scheme, with the result that a site in Corporation Street was granted by the Council, and with the assistance of Mr. Alfred Waterhouse, R.A., plans were obtained in competition, and those submitted by Messrs. Aston Webb & E. Ingress Bell were finally accepted. The foundation-stone was laid with due ceremony by Her Majesty the Queen in her Jubilee year, viz. March 1887, and the building has been in progress ever since. It comprises two large assize courts (civil and criminal), with reading-room for the Bar, robing-room, consultation-room, and all conveniences, retiring rooms for the judges and jury, solicitors, and witnesses' rooms. Also a third court, two police-courts, and a coroner's court, with the necessary retiring rooms.

A great feature in the building, both externally and internally, is the great hall, from which four of the courts open direct, and is a very fine apartment, 80 feet by 40 feet. In addition, there is a handsome room for the magistrates, a grand jury room on the first floor, and the necessary offices, also a refreshment block with the kitchens over. In the basement, extensive accommodation is provided for the reception and housing of the prisoners in separate cells.

The façade of the building in Corporation Street opened on Tuesday is very richly treated in a free Renaissance, and is constructed entirely of red terra-cotta, supplied by Mr. J. C. Edwards, of Ruabon. The sculpture in the centre gable bears the Royal Arms, and in the flanking gables emblematic figures by Mr. Aumonier representing the arts and crafts in the trades of Birmingham. The richest portion is the central entrance porch, adorned by a statue of Her Majesty in the gable by Mr. Harry Bates, and four spandrel figures representing the attributes of Justice, designed by Mr. Walter Crane and executed by Mr. Frith. Below the Queen is a group of St. George and the Dragon. The whole building is crowned by a figure of Justice, by Mr. Frith, who also designed and executed the charming little figures on the summits of the turrets. Red terra-cotta was selected as being the best material for withstanding the atmosphere of Birmingham.

Internally the great hall, the court walls above the panelling, and the corridors, are faced with buff terra-cotta by Messrs. Gibbs & Canning, of Tamworth, and the fittings and wall-linings throughout are of oak. The whole of the architectural modelling was admirably carried out by Mr. Aumonier from the architects' designs. The windows of the great hall are filled with painted glass, as a Jubilee memorial of the city of Birmingham, and were designed by Mr. H. Walter Lonsdale, and executed by Messrs. Heaton, Butler & Bayne. The internal wood-carving, which has met with general admiration, was done by Mr. H. Martyn, of Cheltenham. The gates and the metal fittings throughout the interior are Messrs. Hart, Son & Peard's work, and a point has been made to employ local firms, wherever practicable, throughout, who with the sub-contractors have carried out their respective work to the great satisfaction of the Corporation and architects. Especial attention has been given to the heating and ventilation. The foul air is extracted from all the courts by means of Green's air-compressed vessels, and are all under separate control; fresh air is admitted into large reservoirs under the court floors, which can be warmed or cooled as required. The courts are also heated by direct radiation from radiators in the courts, while the whole of these complex arrangements are brought under easy control of the engineer in an indicating room, where automatic thermometers also register the temperature of each court. The building is lighted throughout by electricity.

The general contractor of the works is Mr. John Bowen, of Balsall Heath, Birmingham, and the furniture has been executed by Messrs. Chamberlain, King & Jones, from designs by the architects. Happily, throughout the whole of the four years there has been no fatal accident to any of the men engaged thereon, though, unfortunately, two clerks of works, Mr. Clapp and Mr. Richards, have died. Their successor, Mr. E. W. Nightingale, has seen the building brought to a satisfactory completion.

NOTES AND COMMENTS.

Speculative building is too often treated in the courts as a sort of criminal action which should be punished in a more severe manner than is feasible under existing Acts. It is not plain why one class of business should be judged in that way, while in others speculation is allowed to go on unchecked. The Judge of the Brighton County Court took a more rational view of building enterprise in dealing with a bankruptcy case on Tuesday. The Official Receiver, in his report, had stated that the debtor, who is a builder, had been guilty of rash and hazardous speculation, and his honour said he had to consider how far speculative building was engaging in rash and hazardous speculation. The debtor possessed little or no capital, and he had done what all speculative builders did all over the country. He had taken plots of land on building agreements, and having no capital to build himself, he went to a solicitor or some one else to finance him. He did not see the difference between this and the ordinary manufacturer. The builder manufactured houses, and if there was a demand he made a profit as other manufacturers did. There were, of course, cases in which he might take a plot of land and contract debts without a reasonable probability of being able to pay them, and that would be a rash and hazardous speculation. In seaside towns they built houses when there was a demand, and realised as fast as they could, and in the end, perhaps, there were more houses built than could be got rid of. In this case the debtor commenced business in 1879, in partnership, with a capital of about 90*l.*, but the partnership only lasted for a fortnight. The debtor continued by himself, and in the latter part of his career he took a house when he was in difficulties, but there was nothing to indicate that he would not be able to realise the ordinary profit of a builder. He was not satisfied that this was a matter of rash and hazardous speculation, but he should be glad to have his decision reviewed. The debtor had committed the other technical offences under the Act, as he had not kept books, and had continued to trade after he knew himself to be insolvent, and for those offences his discharge was suspended for six months. But as to the graver charge of rash and hazardous speculation, he was, as is said in the North, "assoilzied." Of course it is hard on creditors that men should incur debts without means of paying, but the risks of speculative building should by this time be known to all the world.

When the Grand Canal, which connected Dublin with the Shannon and the West of Ireland, was constructed, it was natural that the extent of the traffic should be exaggerated. To provide accommodation for the crowds of passengers that were anticipated, a very big hotel, that would serve for Southampton, was erected at Portobello, in Dublin. But it was soon found that people did not need a resting-place of that sort, and the hotel was soon a failure. In course of time railways superseded the canals for all but goods traffic, and when the long narrow packet-boats ceased to be seen at Portobello, the hotel became a memorial of obsolete arrangements. An effort was made to uphold the building as a suburban retreat, but out of Venice and Amsterdam the view of a canal basin is not exhilarating, and for want of more profitable guests the hotel was employed as a refuge for the blind and as a charitable asylum. But as cheaper premises were easily obtainable, benevolent people could only employ the place for temporary purposes. In 1870 another attempt was made to utilise the building as a hotel, and a lease was granted at a rental of 125*l.*, which, if the area of the premises be considered, was only a nominal sum. The experiment was not successful, and in 1889 the Grand Canal Company were glad to accept a tenant at a rent of 100*l.* a year. The new lessee was wiser than his predecessors. On the opposite side of the canal stood Portobello Barracks, which needed enlargement. It was proposed to utilise the hotel, and the lessee arranged to accommodate seventy-six non-commissioned officers and their families. For that purpose it was necessary to make some alterations in the building. The Government, no doubt, agreed to pay liberally, and the Canal Company, after bearing so unprofitable a burthen for many years, were wroth to discover that they had failed to secure the War Department for a tenant. Application was made for an injunction to prevent the lessee from making alterations, on the ground that he had agreed to uphold the building as a hotel and was converting it into a military barrack. The Vice-Chancellor granted the injunction. The case was brought before the Irish Court of Appeal last week, when the previous decision was set aside as erroneous. The Lord Chancellor said all the parties seemed anxious to obtain as much as possible out of the War Office. As to the conditions of the lease his lordship said that the lessee was bound not to sublet to any person that was not solvent and respectable, and it could hardly be said that the War Office did not fulfil the conditions. The Lord Chancellor held that the alterations in the building were ameliorative, others might be trifling, but the original state of things could be restored for a few pounds. The case is instructive, but it is not unique. Owners of property which does not pay are very glad to secure a tenant, but they expect that the tenancy will entail sacrifices. If unexpectedly the building becomes profitable, there is an examination of documents with the view of annulling the tenancy. After so long an experience of a deserted hotel, the Grand Canal Company ought to rejoice in the prospect of receiving an annual rent for ninety-nine years, and it is not likely that any sort of occupation could diminish the value of the building.

A case is likely to be heard in the Scottish Courts which will determine an important question, that is, Can a Dean of Guild Court take the initiative in a case, and thus depart from the ordinary procedure in all courts? It is needless to say that a Dean of Guild Court to some extent resembles the committee of a local authority in England that is concerned with the approval of plans for new buildings, but the proceedings are more formal. In the Glasgow Court application was lately made for the erection of buildings in Finnieston Street. The original conditions dating from 1770 prescribed that all houses in the street should be at a distance of 20 feet from the street, so that the houses on both sides should be 90 feet apart. It was proposed in the case in question to build over the reserved space of 20 feet. No objection was made by the owners or occupants of houses in the street to the innovation. They may, however, have supposed that if liberty to build was allowed in one case it would be granted to other applicants. Although there was no opposition the Dean of Guild declined to approve of the plans of the proposed works. His grounds were that the master of works was bound to bring under the cognisance of the Court all deviations from the existing line of street, and that when that officer failed it was the peculiar province and duty of the Court to see that no deviation from or alteration of the existing building line of a street is permitted. As commonly understood, the peculiar province of a court is to hear evidence and to give decisions that will correspond with what is brought forward. It would not always bring about justice if the judges were to be guided by their own knowledge, although in many cases it may be an advantage for a judge to have intrinsic evidence of circumstances. As a departure from procedure the Dean of Guild's decision may be set aside. At the same time, it is well to have somebody who can take an interest in the amenity of a city or town and does not mind standing alone if injurious changes are prevented.

The annual fête in France has been as usual made the occasion to enroll some artists and others on the roll of the Legion of Honour. M. Baudouin, many of whose works were illustrated in this journal, was long entitled to distinction, for his decorative works in public buildings are admired by all competent judges. The chevaliers are also increased by the addition of other painters—MM. Demont, Doucet, Lagarde, Pelez and Saintin. M. Gerhardt has been selected as the representative of architecture, M. Peynot for sculpture, and M. Lecouteux for engraving. M. Charlemont, an Austrian painter, whose portraits and other works are much admired by fashionable patrons, has been nominated to the order at the instance of the Minister for Foreign Affairs. M. Larroumet, the director of the Department of Art, having grown weary with his official duties, wisely retired, and the promotion to the grade of officer will console him for any loss he may have sustained.



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CHURCH OF S. MARK, MILVERTON, LEAMINGTON.

VIEW FROM THE SOUTH-EAST.

CHURCH OF S. MARK, MILVERTON, LEAMINGTON.



CHURCH OF S. MARK, MILVERTON, LEAMINGTON.

VIEW FROM THE NORTH.

The Architect, July 24th 1891.

Architectural Illustration Society, Second Series, Plate No. 389.



N.B.-PHOTO SPRAGUE & CO 4 & 5, EAST HARDING STREET FETTER LANE, E.C.

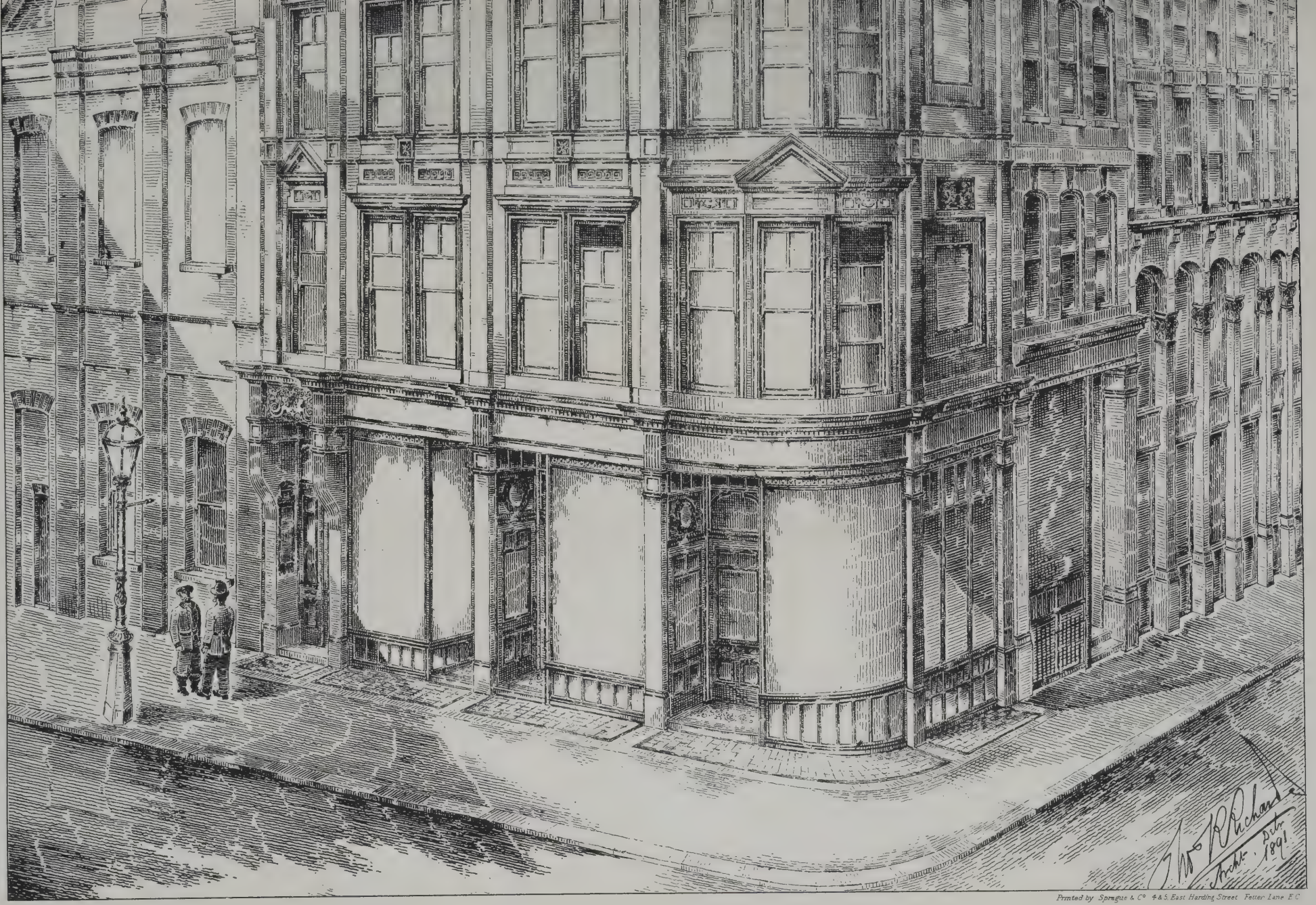
KINMEL PARK, ABERGELE.—THE HALL.

THE SEAT OF H. R. HUGHES, ESQ.

The late W. EDEN NESFIELD, Architect.

The Architectural Illustration Society. Scale 1 inch. Plate No 301





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NEW PREMISES, EASTCHEAP, E.C.

THOS. R. RICHARDS, Architect.

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NOS. 388, 389, 390.—CHURCH OF ST. MARK, MILVERTON. [G. G. SCOTT, M.A.]

NO. 391.—HALL, KIMMEL PARK. [W. H. NESFIELD.]

NOS. 20-26 EASTCHEAP, E.C.

THE above premises stand on a prominent site on the south side of Eastcheap, at the corner of St. Mary-at-Hill; the roadway here is of considerable width, and under same in front of the building the District Railway passes, its Monument Station being close by. The structure has six floors, with the basement, and the extent of the frontage gives a good light interior. The angle of the site is rounded off into a bold curve, pilasters on ground-floor marking ends. Between these points a curved steel girder carries the work above, Mr. A. D. DAWNAY carrying out this and other constructional ironwork. Vaults extend under the pavements, and same and basement are well lighted with HAYWARD'S prismatic pavement lights, extending right round the building. The basement is 14 feet high, and the walls of same are lined with white glazed bricks. The pilasters to front on ground-floor are in red Aberdeen granite, the bases in grey granite, the cornice, &c., over in red Mansfield stone, carved over doorway. The whole of the joiners' work to shop fronts, doors, linings, soffits, &c., is in polished teak, with bevelled plate-glass to doors, &c. The work above ground storey is in specially moulded red brickwork supplied by the New Heather Colliery Company, this company also supplying the finials, scrolls, keystones, strings, cornices, copings, &c., moulded and modelled from the architect's designs. The work is a good example of a brick front carried out in moulded work throughout, including its ornamental features. At the corner the ground-floor and two floors over follow the curve of the site; on the next floor the angle is canted, and has a square bay projecting, finishing above with an octagonal turret. A square turret is placed at the east end of the building, which takes circular form in its upper stage. Both turrets have wrought-iron finials, and are covered with lead with ornamental ribs, bosses, &c. There is a fireproof floor over the shops, and the stairs are of fireproof construction to first floor. The other stairs are in teak, with mosaic to landings, entrance-hall, &c. The whole of the works have been carried out by the builders, Messrs. COLLS & SONS, of 5 Coleman Street, E.C., from the designs and under the superintendence of the architect, Mr. THOS. R. RICHARDS, of 25 Bedford Row, W.C.

THE NATIONAL GALLERY OF BRITISH ART.

IT is understood, says the *Times*, that the question whether the City shall find a site on the Thames Embankment for the proposed National Gallery of British Art is about to be determined, one way or the other. The committee of the Corporation, after going very deeply into the financial question, is believed to have decided not to recommend the free gift of the desired site; and now it remains to be seen whether any arrangement can be come to which shall mutually satisfy the Corporation of London and the Government. This, it is certain, can only be done by handsome concessions on the part of the City. The Government, with all the other claims upon it, cannot be expected to pay the full market price for the site, and public opinion would support it if it were to give the Corporation to understand that it could only treat on very exceptional terms. For the Government already possesses land of its own, some of which it has offered to the munificent donor of the gallery; and if it had not been for the unexpected opposition of the men of science, that land would by this time have been cleared for the building. In deference to that opposition from so highly-respected a body, the Government is content to look elsewhere for a site; but of course it would be too much to hope that, in the circumstances, they would go into the open market and buy an acre on the Thames Embankment unless the owners met them in a patriotic spirit.

There can be no question that the site in question, between the Temple and the City of London School, is the ideal site for such a gallery as it is proposed to found. The space is sufficient for a beginning, and there is more land behind; the position cries out for a fine building; it is open and airy; above all, it is central. A gallery built there would be free from the objections which the millions who inhabit East, South and North London commonly bring against South Kensington—that it is far from everything except the houses of the well-to-do. A British gallery at South Kensington would be little more that a superior edition of the galleries that exist there already. A British gallery on the Embankment would be, in course of time, a great national and civic institution. Everybody would see it; everybody would visit it. The advantage that it would be to the City is obvious. It would achieve for the Corporation the same result, on a very much larger scale, that has been already achieved by the very useful building close by, the Guildhall School of Music; that is to say, it would connect, in the minds of thousands, the name of the City of London with the arts and accomplishments that adorn life. We hope that patriotism and enlightened self-interest will induce the Corporation to propose such terms for the cession of the land as the Government can fairly accept, and thus to secure the success of a project in which the whole country is interested.

THE GOLDSMITHS' COMPANY'S TECHNICAL AND RECREATIVE INSTITUTE.

THE site of this institute comprises the buildings and land at New Cross, S.E., recently occupied as the well-known Royal Naval School, the foundation-stone of which was laid by the late Prince Consort on "the glorious first of June," 1843. On the removal of the school to country quarters the Goldsmiths' Company purchased the buildings and about 7 acres of land, and with considerable rearrangements and additions have adapted them to the present purpose. The old buildings formed the four sides of a quadrangle or open space of nearly 100 feet square, and with their numerous classrooms, large dormitories and general schoolroom lent themselves better than could have been expected to the change of circumstances, though no doubt many of the details would have been more conveniently arranged in an entirely new building.

The front of the main building is retired on rising ground from the Lewisham High Road, giving space for a garden with carriage approach to the main entrance and footways to the separate departments for men and women. In general terms, it may be said that the men's classrooms, the workshops, &c., occupy the right or northern wing, and the women's department the left or southern.

On the ground and mezzanine floors of the main front are the rooms of the resident secretary, Mr. J. S. Redmayne; the administrative offices and bookstall, at which students can purchase their class-books and other requisites at moderate prices. The first or principal floor is devoted to library and reading and news-room, 100 feet by 28 feet, approached by separate staircases from the men's and women's departments. Additional book-stores are arranged in the mezzanine below, communicating direct with the library.

The northern wing is occupied on the ground-floor by the refreshment-room, 90 feet by 24 feet, served by new and carefully-arranged kitchens, with their necessary adjuncts. Beyond this and in proximity to the gymnasium and workshops are the men's lavatories, with hot and cold water, locker-rooms, men's club-rooms, &c. In the mezzanine over these are the clay-modelling rooms and other smaller rooms, for the use of some of the masters, and for chess and other games. On the lofty first floor is men's social room, 50 feet by 35 feet, and approached by separate staircases, the art class-rooms having a total extent of about 200 feet by 35 feet, divided into elementary and advanced drawing, life-study, dressing-rooms for the models, lavatories, cloak-rooms, &c.

Approached from the ground-floor of this wing are the engineer's workshops, 70 feet by 30 feet, and large electrical laboratory, all fitted with the best appliances. Adjoining the engineer's shops is the engine, which drives the whole of the machinery, and the pumps, drawing water from a deep well sunk into the chalk, for the general supply of the establishment and for filling the swimming bath. Here are also the boilers which supply steam for the engine, for the general warming of the buildings and for heating the water of the swimming bath. In a block near to the engineer's shop, and having its machinery connected with the main driving shaft, is the carpenter's shop, with large class or lecture-room over, with several smaller rooms destined for type-writing, commercial classes and such of the less important branches of trade as it may be found necessary to accommodate.

The south wing, or women's side, contains on the ground floor classrooms for needlework, cookery and general instruction, women's lavatories, cloakrooms, &c.; also a large classroom, approached from both sides, and to be used chiefly for physical research or other special scientific demonstration. In the mezzanine are several private rooms and rooms for games, for small classes, or meetings. On the first floor is the women's social room, 40 feet by 35 feet; the chemical department, about 150 feet by 35 feet, approached by staircases from both sides,

and divided into elementary and advanced classrooms, each fitted as a complete laboratory with benches, sinks, fume closets and all experimental appliances. Adjoining is the balance-room, chemical lecture-room for 70 or 80 students, demonstrator's preparation room, &c. Above this are the photographic studio, dark rooms, &c.

In connection with the technical department must also be mentioned the old school chapel, capable of seating some 500 people. It is detached from the other buildings, and can be also approached from the public road should it be found desirable at any time to admit other than members. It has been deconsecrated by special Act of Parliament, an additional room has been added, and it is intended to be used as a general lecture hall, and for lantern exhibitions or for large musical classes, as occasion may arise.

In the recreative department, the feature which first attracts notice is the large concert hall, which occupies the site of the central quadrangle before mentioned. It is 98 feet by 88 feet, and is approached directly from the lobby in connection with the principal entrance. As it was necessary to preserve the light and air for the upper storey of the buildings round the quadrangle, and the existing walls were not of sufficient strength to carry a roof of so great a span, a special and somewhat novel method of construction has been adopted. Curved lattice ribs of great depth, bolted down to special foundations, spring direct from the floor level in the four corners of the hall. Uniting at the apex, about 40 feet in height, these form two diagonal arches of 125 feet span, leaving the whole surface of the floor free and uninterrupted by columns or other supports. Lattice girders or purlins, of 68 feet span, 25 feet from the floor, with others of less dimensions, carry the rafters and covering of the roof. The hall is well lighted from the roof at the junction of the main ribs, and by a series of skylights at a lower level. The platform and galleries for chorus are on the western side of the hall, and a fine organ is in course of construction by Messrs. Abbott & Smith, of Leeds, at a cost of some 2,000*l*. The floor of the hall will seat about 1,300 people according to County Council requirements, besides performers and chorus of about 100 persons. On the mezzanine level are galleries to hold 200 to 250, with independent staircases. Care has been taken to provide sufficient exit in case of panic among the audience. There is a spacious corridor on all sides of the hall, and besides the main entrance doors on the western side, which are 10 feet in width, there are two of 7 feet in each of the other sides, with corresponding doors in the outside walls of the building giving on to the open ground. The galleries are approached by similar corridors on the mezzanine floor, and special external escape stairs lead from each to the grounds outside the building.

Immediately at the back of the great hall is the gymnasium, about 100 feet by 38 feet, which has been adapted and enlarged from the old Royal Naval Schoolroom. On one side of this is a gallery, from which spectators can watch the special gymnastic displays which will take place from time to time. Here also will be fixed the motors for supplying air to the organ.

To the north-west of the principal buildings, and connected therewith by corridors, is the new swimming-bath, 90 feet by 50 feet, the pond itself being 80 feet by 30 feet, with a capacity of about 80,000 gallons. The bath is supplied from the well, the West Kent Water Company's mains being also connected for use in case of need. From the well the water passes through a heater, and is discharged into the bath as a cascade. By means of a centrifugal pump a continuous circulation is kept up, water being abstracted from the bath, passed through the heater, and returned by the cascade at the rate of some 6,000 or 7,000 gallons per hour with any fresh water required to make up for loss while the bath is in use. A uniform temperature of about 72 degrees is thus retained. On each side are a number of dressing-boxes, over which are galleries for spectators. There is a separate entrance to this bath from the public road, so that it may be available by arrangement for schools, outside clubs or such of the public as may be admitted on specified conditions. The old school swimming-bath (much too small for present requirements) still exists, and will probably be made available for private hot and cold baths should there be a demand for them.

Extending along the back of the building is a large paved court of about 2,000 square yards, which will be available for various games, drill and general exercise in the winter. Beyond this is the recreation-ground about 4½ acres in extent. At considerable cost this has been levelled, and a good running track laid out of about four laps to the mile. Inside the track is space for cricket, tennis or football.

With such experienced practical men as Sir Frederick A. Abel, K.C.B., F.R.S., chairman; Sir Frederick J. Bramwell, Bart., F.R.S.; Dr. W. Anderson, F.R.S., Director-General of Ordnance Factories; Mr. Charles Lucas, and others on the Building Committee, it may be safely assumed that the 70,000*l*. or thereabouts the Goldsmiths' Company are stated to have expended on the Institute and its appliances, has been laid out to the best advantage. It is clear, at any rate, that the chemical and electrical departments, the constructive ironwork and the engineering appliances generally, must have received special attention. The buildings were opened on Wednesday.

The whole of the works have been carried out from the designs and under the superintendence of Mr. J. Wornham Penfold, F.R.I.B.A., surveyor to the Goldsmiths' Company. Mr. Thomas Lee acted as clerk of the works under the direction of the architect. Messrs. Kirk & Randall, of Woolwich, are the general contractors. Messrs. James Simpson & Co., Limited, supplied the engine, boilers and swimming-bath arrangements; and the Thames Ironworks and Shipbuilding Company the constructive ironwork. The warming and lighting, cooking appliances and other fittings were executed by Mr. W. G. Cannon; the chemical working and lecture benches, lockers, &c., by Mr. Thomas Mitchell. The art department general class and lecture-rooms were principally fitted by the North of England School Furnishing Company and Messrs. Hammer; and the library by Messrs. Wake & Dean, the latter room being also fitted with the ingenious "indicator" of Mr. Cotgreave. The running track and general ground work have been carried out by Mr. George Neale, of Wandsworth.

ST. OLAVE'S, JEWRY.

OUR old City churches, says the *Daily News*, have made a brave stand against those who look with a covetous eye upon the precious sites that they occupy; but their shrunken congregations and empty seats have testified too clearly against them, and one by one the least needed are disappearing or being converted to secular uses. Vast banks and offices have taken the place of dwellings in their parishes; citizens of the class who, in John Gilpin's time, were content with an occasional outing with the wife and the children, now live in leafy places far away from the sound of City church bells and in the natural course of things, when the parish deserts the church the church has a tendency to desert the parish.

The latest of these edifices thus marked out for demolition is St. Olave's, Jewry, which together with the freehold ground it occupies, save only what is needed for the widening of Old Jewry, was offered for sale by Messrs. Fox & Bousfield, at the Auction Mart, on Wednesday. The affix "Jewry" is derived from the fact that it stands on part of the site of the Jews' House—a vast building of which Stow speaks as extending "of old time" over nearly the entire space between Old Jewry and Ironmonger Lane, northward from Church Court to what is now called Gresham Street. The poor old church, with its square stone tower and four pinnacles, looks forlorn enough just now, dismantled as it is within and neglected without. Its windows have been all shattered by wanton stone-throwers; its long grave ground, whose few sickly, and almost leafless, limes were yielding on Saturday no shelter from the burning sun, is barren of anything green save an unwholesome moss covering the whole like the slime in a stagnant pool. One of those gaunt starved cats who are left untended in town by cruelly thoughtless absentees at this seaside season is now the sole token of life to be discerned through the weather-eaten iron railings of this dismal spot. St. Olave's, Jewry, known in ancient times as St. Olave's Upwell, is one of Wren's churches, but it is not a remarkable specimen of his work. Near to it, in Ironmonger Lane, stood, before the Great Fire, another church known as St. Martin Pomary, or Pomeroy, from a famous apple orchard that once was here in the heart of London City, but after the fire the two parishes were united, and Wren's church thenceforth served for both. It is not a very remarkable specimen of that great master's work. One of the sights of its north aisle used to be a portrait of King Charles I. at his devotion, with his right hand on his breast and his left holding a crown of thorns and a scroll. Near this was a curious allegorical painting of Old Time with his hour-glass, standing beside a cupid reposing on fruit, and having beneath his feet a skeleton about 8 feet in length. Here, too, the eyes of curious visitors were gratified with a painting of Queen Elizabeth lying on a fine tomb under an arched canopy, with Her Majesty's arms upheld between two cupids; but our information is from old Hatton, of Queen Anne's days, and it may be that these once familiar glories of its north aisle have long since vanished. What monuments of interest the present church possessed, however, were there till the other day, when they were removed by Canon Ingram to the church of St. Margaret, Lothbury, which has profited not a little by these and other like spoils. Among them the most conspicuous is the handsome oak gallery, supported by Tuscan columns, the fine wainscot partition at the west end, and the altar-piece ornamented with Corinthian pilasters, supporting an open arched pediment, in which the arms of England are sculptured, and having between them figures of Moses and Aaron, with the Decalogue, the whole embellished with palm branches, fruit, leaves and "cartouches." The ancient monument to Thomas Morestead, "chirurgeon to Henry IV., V. and VI.," who built

the north aisle, and lay buried there, probably perished in the fire, together with that of Robert Large, the mercer, who was Caxton's old master; and that to Sir John Leigh, 1564, with its epitaph :—

> No wealth, no praise, no bright renown, no skill,
> No force, no fame, no prince's love, no toil,
> Through foreign land by travel, search ye well,
> No faithful service of the country soil,
> Can life prolong one minute of an hour,
> But death at length will execute his power.

Wren's structure could boast of none so dignified as these—of none, indeed, more noteworthy than the monument to Alderman Boydell, whose name now lives chiefly in association with an edition of Shakespeare which was at once the most absurd and the most costly ever published. The bust of the worthy Alderman now looks blandly down upon worshippers in St. Margaret's, for, thanks in part to the attendance of the Sunday-school scholars, who bring with them friends and relations, Canon Ingram is spared the humiliation of preaching on Sundays to an empty church. From this time forth St. Margaret's, St. Olave's (a living in the gift of the Crown), and St. Martin's in the Apple Orchard will be one parish with one church, and soon Wren's broken-down deserted old edifice will give way to lofty buildings in the modern City style; for this, as the particulars of Wednesday's sale remind us, is "within a few yards of the Bank of England"—a quarter where to tread the soil is to walk upon gold.

THE LATE SIR W. FETTES DOUGLAS, P.R.S.A.

WE regret to have to announce the death of the President of the Royal Scottish Academy on Monday last.

Sir William Fettes Douglas was born, the *Scotsman* says, at Edinburgh, on March 29, 1822. He was thus sixty-nine years of age. His father, James Douglas, was accountant in the Commercial Bank. His mother was Martha Brook, a grandniece of Sir William Fettes, Bart., the founder of Fettes College. It is not uninteresting to notice that Mr. James Douglas, his father, was in his day an excellent water-colour artist, and that not a few of his views of old Scottish castles were published in the beginning of the century in the *Scots Magazine*. In deference to the wishes of his father, young Douglas, who had been educated at the Southern Academy and the High School, entered the service of the Commercial Bank in 1836, and was in that establishment for ten years. His tastes, however, were all artistic, and his father was ultimately persuaded to allow his son to devote himself to art. Before quitting the bank he had worked diligently at home with his pencil and shown conclusively the bent of his leanings. It may be said that he had no systematic and academic training in art. He attended for three or four months the Trustees' Academy, then under the care of Sir William Allan, where he had for contemporaries the Faeds, Mr. Archer, Mr. Erskine Nicol and other artists who have risen to eminence, and there was a sketching club in these days, still spoken of with enthusiasm by its members, of which Douglas is described as having been the life and soul. He also worked a little in a desultory way in a life-class in connection with the institution, but for the most part the knowledge of painting which he gained was self-acquired. His life-studies and drawings were notable, even at this early period of his career, for that daintiness of draughtsmanship and delicacy of finish which characterised much of his work when in the fulness of his power. While prosecuting his art studies he attended the Edinburgh University, where he matriculated in 1847, and he took for two consecutive seasons the classes of botany under the late Professor Balfour, and anatomy under Professor Goodsir. Of the latter study he became so enamoured that it became a question whether or not he would abandon his artistic for a medical career. But art triumphed. Another fact of his early days may be mentioned. We believe he never copied a picture of any kind in his life; and so far he had the advantage of creating his own style, so to speak, and thus secured an originality of treatment which many painters are often unable to do, who only see through the medium of some favourite master whom they adopt as a model.

At the age of twenty-one Mr. Douglas began to exhibit by sending some portraits to the Scottish Academy. One of these, which was modestly catalogued *A Study of Light and Shade for a Portrait*, was a likeness of the artist himself, which those who remember it speak of as a striking and effective piece of work. In the two or three years immediately following he exhibited some rustic and other subjects, such as *Entertainment for Man and Horse*, *The Norseman and the Sicilian Captive*, *The Fiddler's Comfort*, *Bandits Selling Spoil* and *The Astrologer*. The last-named work attracted special notice as a conception imposing in character, and painted with a remarkably vigorous brush. *The Death of Sir Andrew Beaton*, *The Widow's Mite* and *The Intercepted Despatch* belong to this period. *The Knifegrinder*, exhibited in 1850, is an excellent example of *genre* painting; and *The Departure for Battle*, of the same year, represents with considerable artistic skill a group of armed soldiers, half-length figures, of the olden time taking leave of their friends.

In 1851 Mr. Douglas was elected an Associate of the Academy, to which in the following year he sent *The Biblomaniac*, a very clever work, and *An Auld Scotch Wife*, one of the most original and powerfully-painted pictures then hung in the gallery. With the former of these the artist seems to have entered upon the field of romance, out of which came so large a proportion of his subsequent productions. Of these, one of the earliest was *The Bibliopolists*, now in South Kensington. In 1854 Mr. Douglas received his diploma as full member of the Scottish Academy: he exhibited that year three pictures. The first was an illustration of the well-known story of "Dean Swift and the Errand Boy." The lad who has brought the present of game is duly installed in his reverence's chair, a piece of furniture which, as might be expected from the dean's habits and customs, is somewhat out of repair—disorganised, in fact, as the bookshelves against which it is relieved, or even as the books themselves. The Dean's portrait is undoubtedly a lifelike representation of this eccentric character, according to the descriptions given by his contemporaries. The accessories of the picture are painted with exquisite finish, and the nose and expression of the young man in the chair are wonderfully significant of sly humour. The second work of this year was the *Attempted Assassination of the Prince of Orange*, a subject which, though foreign to the artist's usual themes, is treated in a masterly and most effective manner, both with regard to colour and design. The third picture was *Philosophy in the Olden Time*, suggested by Scott's lines :—

> For when in studious mood he paced
> St. Andrews cloistered hall,
> His form no darkening shadow traced
> Upon the sunny wall.

In 1855 his contributions to the Academy included *The Guard-House Chorus*, a capital work, remarkably vigorous in manner, fine in colour, and the figures extremely well drawn; *Monkish Transcribers* and *Among the Brambles*, a very elaborate and prosaic transcript of nature. Under the title of *The Tempter*, appeared in the following year a picture that might not inappropriately be called *The First Thought of Murder*. The composition contains two figures, one of which is seated at a table and is tempted by the offer of a reward to commit some foul deed by a shadowy figure behind, who places a pen before him while he charms his ears with the sound of gold. It is a striking subject, elaborately worked out. With it was the *Rosicrucians*, a group of those mystics of past ages engaged in conversation as they stand before a curtain drawn across the apartment.

In 1857 Mr. Douglas visited Italy, less, however, for the purpose of study than for pleasure and a desire to see the country—in fact, as he himself remarked, he "did nothing but prowl about the old churches and curiosity-shops." Yet he left in Edinburgh for the Academy exhibition of the year this picture, *The Messenger of Evil Tidings*, a scene of the time of the Civil Wars, to judge from the costume of the figures. It tells its story dramatically and perspicuously, and is placed on the canvas with much artistic power. This picture was accompanied by another—*The Alchemist*—showing an interior, in which is seated the man of science intent on some profound study and surrounded by a mass of objects, such as a painter who delights in things "old and strange" rejoices in as models. The old monkish legend of "St. Dunstan and the Devil" supplied Mr. Douglas with a subject for a capital picture exhibited in 1858. During the next four or five years he painted *The False Astrologer*, *The World Within and the World Without*, *The Arrest of Pietro d'Apone*, *Vesalius*, *The Saintmaker*, *The Last Hours of a Dark Life* and *The Errand of Mercy*. From the hand of almost every other painter than Mr. Douglas the subject of a picture painted by him in Edinburgh in 1862, *Dante arranging His Friends in Inferno*, would have taken most of the visitors by surprise. But the Scottish public frequenting the annual exhibitions of the Academy had become well acquainted with the romanticism of the artist, and regarded his work only as accumulative evidence of his power to treat even the strange, unearthly imaginings of the great Italian poet in a suitable and appreciative spirit.

It was in this year that Mr. Douglas first appeared on the walls of the Royal Academy of London, to which he contributed three excellent, though comparatively small, paintings, respectively entitled *Criticism*, *The Page*, and *A Monk of the Order of San Carlini*. The following year he sent to the same gallery a portrait of Dr. Laing, Honorary Professor of Ancient History in the Scottish Academy. The distinguished antiquarian is seated in his library; the contents of which, such as a man of his tastes and acquirements would gather into his sanctum, afforded the artist ample materials for the exercise of his delicate pencil. The same picture was exhibited in Edinburgh in 1864. With it was *The Alchemist on the Verge of a*

Discovery, a composition which, like some others from the same hand, is capable of diversified reading; and this had a touch of humour in it. Disturbed in his study by a noise in the adjoining room, the dreamy student has come to search for the cause; the dark outer chamber is draped with tapestry on which a love scene is embroidered; but below the picture are visible two pairs of feet—one masculine, the other delicately feminine—and an open window and the rope ladder tell the tale, not very moral, it is true, but artists are privileged. The beautiful glimpse of the moonlit city through the open window, the lighted study of the alchemist, and the dark tapestried outer chamber, form an artistic combination which has called forth the nicest skill of the painter. To this must be added two others of the same year. *Curiosity* represents a lady in her husband's study amusing herself with a beautiful child, and while so doing chances to light upon a small portrait-case, which is supposed to contain a likeness of some fair *inamorata*. *The Spell* is one of those mystical subjects so often indulged in by the painter. There is much originality in the composition, which sufficiently declares itself; probably it is intended, like the astrologer, to have a double meaning. Looking at the picture inverted, there may be seen on what forms the table-cover a pair of lovers in a beautiful landscape. Possibly this forms a key to the "spell."

Mr. Douglas's most attractive picture in the Edinburgh Exhibition of 1865 was the *Return of the Carrier*. An elderly man is seated in his study deeply intent on his papers; a beautiful girl, his daughter, sits on the floor near him. Through an open window the spectator catches a glimpse of the city and the clear blue sky; a carrier pigeon, bearing a letter, has found entrance, and alights behind the chair of the father; the girl's anxious gaze on the bird betrays her secret. *Perfect Solitude*, exhibited with it, is a satirical title of an admirable picture; it also represents a study or library, richly furnished, and abounding with *objets de luxe* and costly-bound volumes, among which is a young girl evidently lost amid her surroundings. *The Conspirators* was a contribution to the Scottish Academy exhibition of 1866; *The Whisper*, which was exhibited in the same year, represents a page and soubrette or waiting woman probably occupied in discussing some love revelation. As an example of *genre* painting, it could scarcely be surpassed. *Waiting for a Last Interview* was hung in the Royal Academy exhibition of 1866; and the *Old World and the New* appeared in the same gallery in 1869.

In 1869 Mr. Douglas was elected secretary of the Academy in succession to Mr. D. O. Hill, but he relinquished that office after holding it for only a short period. On the death of Mr. James Drummond, R.S.A., in 1877, Mr. Douglas was elected as curator of the Scottish National Gallery, a position for which he was eminently fitted, and during his time a revised edition of the catalogue, with interesting notes from his hand, was published. In 1882, on the death of Sir Daniel Macnee, he became, at the call of the Royal Scottish Academy, the president, though in doing so he made a considerable pecuniary sacrifice, and in May of the same year he had the honour of receiving knighthood from the Queen at Windsor. In 1884, on the occasion of the centenary of the university, he received the honorary degree of LL.D.

After a period of inactivity Sir William Fettes Douglas greatly surprised and delighted his friends by taking to water-colour drawings of landscapes, and these he executed in a very beautiful way. As a rule he touched them with a broad and effective pencil. The subject had always an interest of its own, but the charm of the drawings consisted in their soft, restrained colour and delicate treatment of aerial effect. Many of his friends who were fortunate to secure such drawings cherish them among their pictorial treasures. From all that has been said, it will be readily perceived that Sir William Douglas has long held a leading position among Scottish artists. His pencil rarely touched a subject that he did not adorn.

His favourite subjects have been very well indicated in the recital given above of his principal works. He occasionally treated Scottish rustic life, but he found more congenial themes in history, in depicting the lives of antiquarians and bibliomaniacs, and in that remarkable series of pictures which deal with the "uncanny" mysteries of the astrologer and alchemist, which began in 1844 with *The Astrologer*, and were rounded off in 1873 with *The Magic Mirror* and *A Dabbler in Alchemy*. In these the touch of *diablerie* is so dexterously given that the spectator feels insensibly moved in the same way as the messenger, for example, in that splendid work, *The Summons to the Secret Tribunal*, who comes into the dark chamber with his cross-hilted sword held before him. In all these pictures no one can fail to admire the thoroughness with which they are painted. The draughtsmanship of the figure is masterly, the characterisation varied and appropriate, the colour is often rich and glowing like that of an old Italian master, and added to that we find displayed in the works the great skill the artist had in his handling of light and shade. In the pictures, too, with antiquarian subjects, how delightful are his studies of still life; with what subtilty and delicacy he painted parchments, old books and furniture, and how beautifully harmonised in colour these were by the unity of purpose which always distinguished his works. In minuteness of finish and keen observation no pre-Raphaelite could have rivalled him, and he has not inaptly been termed the greatest painter of still life that Scotland has produced. Occasionally Sir William painted a landscape in oil, and if one were asked to name his masterpiece in that department of art it would be the upright picture of Stonehaven, dated in 1875.

Sir William Fettes Douglas was a man of various accomplishments, especially in all subjects that had a relation to antiquarian lore. He resided a good deal in Italy, and, as already indicated, the old curiosity shops of that country had for him a great fascination. He picked up many good and rare things in his day. He formed, for example, a fine collection of coins and Renaissance medals, which were disposed of to good advantage at Christie's in 1883. As a recreation, he went in for collecting works illustrative of what might be called the by-ways of Scottish history and topography, and his fondness for hand-illuminated books, such as missals, and of books with fine old bindings, was also well known. He was an excellent linguist—spoke French, German, Spanish and Italian with fluency; and he had a marvellous memory. A great reader, he remembered much of what he had read. What he saw in his frequent travels was also tenaciously retained, so that at the proper time he never failed to display great command over his intellectual resources. Though possessing a knowledge of art second to none in Scotland, he rarely wrote on his favourite subject. After he became President of the Royal Scottish Academy, he felt it an irksome thing to put ink to paper to put down even the heads of his addresses to the students or of his speeches at the annual banquets. His addresses to the students generally were original, rich and racy, and of a stimulating character. Sir William Fettes Douglas was a man of hospitable disposition, and for some years, when he lived in the quaint old mansion-house of Bowbutts, Kinghorn, where his rich and varied collection of curiosities were displayed, he entertained his friends with characteristic generosity. Latterly, since he fell into bad health, he has lived a quiet, almost retired life. He was a Member of the Board of Manufactures and a Fellow and office-bearer of the Antiquarian Society, and at both of these Boards his counsel was sought and valued. His wife, who survives him, is a daughter of the late Mr. Barron Grahame, of Morphie, Forfarshire, who in his day was a great virtuosi and collector.

A JERUSALEM CHURCH.

THE last number of the "Quarterly Statement" of the Palestine Exploration Fund contains a description by Professor Hayter Lewis of some ruins of a church on the Skull Hill, Jerusalem. During the last few years, he says, building operations to a large extent have been carried on in the environs of Jerusalem, and several objects of interest discovered during the attendant excavations have been duly noted from time to time in our "Quarterly Statements." Amongst these discoveries was that of the small Crusaders' Church near the road, north of the Damascus Gate. The remains of the Crusaders' Church still exist as so described, but the stone on which were the very interesting paintings (representing Our Lord and His Disciples) has been exposed to the air, and only faint traces of them can now be seen.

The land to the eastward of this church was purchased some years since by the French Dominican Friars, whose excavations for the erection of their buildings soon exposed one of the most interesting series of tombs near the city. They have been preserved by the Friars with great care and at considerable expense. Continuing their excavations westward, a trench 8 to 10 feet deep uncovered portions of a tesselated pavement in good condition, and composed entirely of different coloured marbles. I was enabled to see this in 1886, owing to the kindness of Dr. Selah Merrill, the well-known author and American Consul at Jerusalem, who had specially noted it, and so much of it was then exposed as to show that it was the pavement of one long corridor or other apartment, at least 50 feet long. But there was nothing in the design of the mosaic or any of its surroundings to disclose the nature of the building.

Since then, however, the excavations have so far proceeded as to uncover the greater portion of it, and when I saw it again last year it was clearly shown to be the remains of a church, presenting several peculiarities of much interest. It is on the well-known Skull Hill and north-west of Jeremiah's Grotto, and about north of the tomb suggested by General Gordon as probably that of Our Lord, and so indicated in the sketch, &c., given in the "Quarterly Statement" of April 1885. It was evidently three-aisled, with an apsidal eastern end to the centre and square ends to the other aisles, the total length, exclusive of apse, being internally about 105 feet and the breadth 65 feet, being thus about the same width as St. James's, Westminster, but 20 feet longer. The fine church of St. Anne at Jerusalem is only 90 feet long.

The site of this edifice has been interfered with in a very singular way by two deep cuttings in the solid rock. The southern one is cut perpendicularly down to a depth of 16 feet, its shape being irregular, averaging about 36 feet by 27 feet. The northern one has only a trench dug round it, and Mr. Schick is no doubt correct in saying that these excavations were intended "to make a tank or pool, and to quarry stone for building at the same time." It is tolerably certain, however, that the pool was never used as a tank, as a careful examination shows no trace of any cement lining. It is unnecessary to enter further into the purpose or date of these rock-cut excavations, because they do not seem to affect in any way the description of the church, except that they were supposed by the Friars to point out the site of St. Stephen's Tomb —but not the slightest trace of this has been found.

At the western end of the church the wall has nearly disappeared, but there are sufficient traces remaining to show its position, which seems to have been fixed by that of some ancient tombs. One of them has been closed by a rolling stone. The positions of the two aisle columns to the west are well marked, and the Friars assured me that another one had been found, although again covered up. I could not, however, fix its exact position. The sites of any other columns on the north side were still unexcavated when I last visited the place, and, of course, the pool (now entirely cleared out) has obliterated all traces of any work on its site.

Very fortunately one moulded base has been found, evidently belonging to the column mentioned below, its section being like those in the basilica at Bethlehem, the upper torus of which has a peculiar flat and ungraceful form. A long length of one column has also been preserved; its diameter of 3 feet, supposing it to be Corinthian (as in all probability it was), would give a height, including base and capital, of about 30 feet. The three door sills show the probable place of the old doorways.

But the most interesting part of the church, and, fortunately, the best preserved, is the eastern. The stonework of its walls has been, indeed, to a large extent removed, but their external outline has been curiously preserved by a coating of plaster with which they were originally covered, and which now adheres tenaciously to the *débris* which lies against them, showing with complete distinctness the mark of every stone and joint.

I have not met with such another instance of this in any excavations, but Mr. Petrie tells me that he has found such a one in Egypt. There is not anything to indicate the precise form of the interior, but there can scarcely be a doubt that the centre was the usual circular apse.

The steps from the general level of the mosaic to the chancel floor are *in situ*, and so is, to all appearance, the curious slab in the centre of the apse. There are no other indications of the original floor of the chancel, but at the east of the slab was found a large stone, roughly cut to a circular form, 5·2 in diameter and 2·7 high. Both its upper and lower surfaces were quite flat and even.

The shape of the slab with its curious lip and the channels made evidently for the purpose of receiving and pouring off liquids will strike anyone conversant with Egyptian antiquities as having strong resemblance to the tables of offerings, numbers of which are in the museum at Gizeh, and many also in the museums of Turin and Paris. In our own (British) Museum there are several such tables, many of which have a short leg at each angle. But this is not seen generally, and the slab at Jerusalem does not have it.

I know personally of no example of such a slab in a Christian church, and I cannot learn from those of my friends who are best acquainted with Christian antiquities that such another is known in Europe.

Mr. Butler, in his well-known book on the Coptic churches in Egypt, describes several altar-slabs, with channels for washing, and also particularly one at St. Pudentiana in Rome of the fourth century. And the "Encyclopédie Méthodique: Antiquités," vol. i. p. 377, also notices that "Quelques autels antiques sont creusés en dessus et percés de côté pour recueillir et laisser écouler ensuite les libations." But the peculiar lip is absent, and there are no crosses in the Jerusalem slab such as one would expect to find in an altar-stone in any but a Coptic church. Mr. Butler also mentions that beneath the Greek altar there was always a place to carry off the rinsings from the priests' hands and the water used for washing the sacred vessels, and in reference to this I find many notices in ecclesiastical writers, *e.g.*:—

In Durandus, lib. i. "De Altaris Consecratione:" "Ecclesia quoque interim aspergitur et aquæ residuum ad basim altaris funditur." Again, in Martigny's "Dictionary of Christian Antiquities," he describes under the head of Autel (page 60):—"A la base de l'autel se trouvait une piscine où le prêtre se lavait les mains, &c.; on y jettait aussi l'eau qui avait servi à laver les vases sacrés." The absence of crosses appears to me to show that the slab was not an altar, but that it was used as our piscina, to receive the washings. But the lip is a form which, so far as I know, is unique in a Christian church.

The circular stone is equally curious. Bingham, in his "Antiquities" (vol. ii. section 8), speaking of the French Council in A.D. 509, notices that "whereas before that time (in France) they were in the form of tables, they now began to be erected more like altars, either upon a single foot or pillar in the midst, &c., or upon an edifice erected like a tomb." Such a tomb-like edifice exists in the subterranean church of St. John the Baptist at Jerusalem (v. "Notes to Ordnance Survey," p. 59), but I have no recollection of an altar-stone "on a foot or pillar." Professor Middleton, however, states that there is one so constructed at the very early church of St. Angelo at Perugia. This example (which has escaped my notice) may certainly be taken as a confirmation of Bingham's statement. Probably, therefore, the circular stone may be considered as used for a similar purpose.

Finally, we have to consider the tesselated mosaic which formed the pavement of the church. This is made of different coloured marbles, viz. white, black, red, yellow and blue, there being no terra-cotta or stone used anywhere. The tesseræ are ⅛ inch to ¼ inch square, according to their position. The border is one of the ordinary Roman patterns, and the rest of the work is only peculiar as being very plain in design for so costly a material, no figures or foliage being introduced. The workmanship throughout to the border is good, but the tesseræ to the main portion are laid very irregularly. It is everywhere, so far as I could see, fitted to the walls, and was, to all appearance, laid after they were built.

For some clue as to the date of the floor we may turn to another example in Jerusalem, viz. in the church of St. Cross, which is said to have been built by Justinian, and only partly destroyed by Chosroës. I have not seen this pavement, and only know it from a description kindly given to me by Mrs. Finn and from Pierotti's drawings; but if these be correct it is very debased work and the design very poor.

Many other mosaics are now being uncovered in the vicinity of Jerusalem, more particularly near the present Zion Gate, and these are of good workmanship, but plain, and much like that at the church which I am describing.

If we turn to other parts of Palestine we shall find, perhaps, the best example in that given by E. Renan in his "Mission de Phenicé," of a Byzantine church about two leagues from Tyre, and said to have been built in the sixth or seventh century; and there is an inscription which distinctly assigns the mosaic to that date. But in a long and careful treatise on the subject given by Renan, it is clearly shown that this inscription is an interpolation, the mosaic itself being of a much earlier date.

We have, then, the following facts, viz.:—That the church of which we have the ruins on Skull Hill was very ancient, as is shown by its single apse. That the octagonal form of this apse, externally, proves that it was designed under Byzantine influence before the distinctive features given to it in the plan of Sta Sophia at Constantinople and nearly all later Byzantine works. That the church was arranged according to the Roman rite, and with very antique arrangements of altar, &c. That the pavement was Roman, and laid down at a time at which great activity prevailed in ecclesiastical work at Jerusalem generally, as is shown by other large remains of similar mosaic pavements in other parts near the city. That the marble linings still remaining to the north-eastern base, together with the costly mosaic floor, show that this church was one of great magnificence. There is no mention of its erection in the account of Justinian's work given by Procopius.

It appears to me that its authorship is explained satisfactorily in the annexed note, given to me for other purposes by Sir C. W. Wilson:—"I do not think that sufficient attention has been given to the great building period at Jerusalem when the Empress Eudocia was there. She built St. Stephen's Church, and it was, too, about this period, or a little later, that I attribute the many churches including that, *in probatica*, the Siloam Church of Antoninus, &c." The history of the Empress is well known. She married the Emperor Theodosius II. in A.D. 421, made a pilgrimage to the Holy Land in 438, and a short time afterwards began the erection of St. Stephen's Church, in which she was buried, her death taking place in 460. It appears to me that the remains of this church fulfil the conditions which we might expect at such a time, when Roman work had been influenced by Byzantine.

The position of the church appears to agree fully with the requirements of this opinion. It is situate on the commanding hill which is well known as the Place of Stoning, close to the Gate (Damascus) which was formerly known as St. Stephen's, and answers to the description given by the Russian Abbot Daniel (1106-67 A.D.), who appears to have entered by the Nablûs road:—"To the left, near to the road, there is the church of the first martyr, St. Stephen—it was at this place that he was stoned by the Jews."

There is, however, the fact to be ceded that the pilgrim Theodorich (c. 1172 A.D.) says, in describing his tour from west to east, outside the walls of Jerusalem, "before you reach the northern gate you find, upon a hill, the church of St. Stephen, the protomartyr," &c. The pilgrim Antoninus (c. 570 A.D.) makes a similar statement, so that we have his description of

the site of the ancient church before the destruction of the churches by Chosroës, and Theodorich's description to the same effect after its rebuilding by the Crusaders.

These accounts would, apparently, place the church on the hill to the west of the Damascus road, and away from the Skull Hill, the position being that suggested by Dr. Chaplin in the "Quarterly Statement" for 1876, p. 9, and very close to the tomb which Major Conder has suggested as being very probably that of Our Lord. Some of the other pilgrims appear to support this view, but others place the site of the stoning and of the church in entirely different positions from the above, and the various statements are otherwise singularly confused and at variance with each other. They are given clearly, and collated, in the Appendix A to the description by the Abbot Daniel (P. Pilgrims' Test. Soc.), and I will not attempt to reconcile them.

All that can, I think, be said at present is that we have no remains except those of the church which I have above described, which appear to fulfil the conditions of the Empress Eudocia's church. The sarcophagus which was found on the Western Hill (v. "Quarterly Statement," 1876, page 9), though of great size, was, I believe, quite destitute of ornament, and not likely to be that of an Empress. The position of her sarcophagus may possibly be indicated by the chamber to the south of the church.

REHOUSING THE POOR IN MANCHESTER.

A SPECIAL COMMISSION of the *Lancet* has reported on the schemes for the rehousing the poor in Manchester, and it will be seen that some of the statements are applicable to other towns:—

So far back as the autumn of 1889, it was decided to lodge a petition with the Local Government Board, asking for a local inquiry. In November of the same year a Bill was prepared for Parliament, entitled the Manchester Dwellings Scheme, 1890, by which the Corporation were to have the right of expropriating the owners of the condemned property, and of erecting in its stead suitable dwellings or lodging-houses for persons of the working class. Four different areas were included in this scheme. The first that has been mentioned, measured 19,271 square yards, and had 1,250 inhabitants; the second, 4,233 yards, with 400 inhabitants; the third, 863 square yards, with 120 inhabitants; and the fourth, 956 square yards, with 100 inhabitants. The cost of the land and improvements was set down at 103,000*l*. The interest of this scheme rests not so much with the size of the areas involved, but on the far-reaching plan of action on which it is based. The Corporation intended on the first and largest area to build a model common lodging-house, similar to those already built by the city of Glasgow. This common lodging-house, like those of Glasgow, was to remain the property of the town. On the remaining land model tenement dwellings or artisans' cottages were to be built, and let out directly by the municipality to the occupier. This being accomplished, the municipal property was destined to serve as a model and a menace to all property owners. Having set the example, the authorities of the town were to treat all owners of insanitary and degraded property with unprecedented severity. They were to be told that if they did not make their houses as good in every respect as the houses, &c., owned by the municipality, they would, in their turn, be expropriated, and the town would undertake to build proper dwellings. In a word, the Corporation was about to compete with private owners, and compel the latter to vastly improve their property or to sell out.

This seemed a bold scheme, and at first sight gave every promise of success. Unfortunately, we have to deal with a number of details that combine together to thwart the scheme. A very important change has taken place in Manchester during the last thirty years, and it very disadvantageously affects the powers for doing good the municipality would otherwise possess. Formerly most of the owners of the property tenanted by the poor of Manchester were fairly respectable people. They had of necessity, however, to employ a very harsh class of men as rent collectors, or property agents. These agents were often rough, hard, uneducated men, the very last class of person likely to appreciate the broad interests of humanity involved in the cause of sanitary reform. Yet these property agents have now become to a very large extent property owners. The former owners, sometimes gentlemen of broad and generous views, were also often spendthrifts. They therefore too readily consented to accept loans of money from their rent collectors, and the latter thus gradually became owners of the property for which they had been but the agents. Soon a numerous class of people commenced seeking by every means to become the owners of poor cottages and of bad property. By the operations of building societies also a good many houses have passed into the hands of this class of person.

The mischief this has wrought will be easily understood. As a class these owners are opposed to sanitary reform. It is the bad, over-crowded, degraded and insanitary property that, in proportion to the capital invested, brings in by far the largest profit. The tenants for the most part pay their rent once a week, and are very often a few weeks in arrears. They stand, therefore, in terror of the collectors, who at any moment may throw them out into the street. As most of these tenants occupy, not lodgings, but cottages, they have votes for the election of the Town Council, but they generally vote for the nominee of their landlords. Thus this new class of property owners, which has sprung into existence within the last few years, influences both the poor and the members of the Town Council. Yet, and in spite of this undoubtedly strong and hostile influence, the very bold scheme of sanitary reform we have described above was adopted by the town and received the sanction of Parliament.

If we look a little below the surface, it will be seen that those who receive their income from the poor may still hope to enjoy for some time to come a very large measure of immunity. It will soon be discovered that, after all, the Housing of the Working Classes Act of 1890 works to the advantage of the landlord. With the exception of the 10 per cent. extra compensation for compulsory sale, it is in the main a repetition of the Land Clauses Act. The sum of compensation which the sanitary authority must give to owners of condemned property has to be fixed by an arbitrator, and this arbitrator can, if he chooses, take into consideration not what the property is worth, but what it may be worth by-and-by. He may make allowance for the unearned increment that may accrue at some future date. Nor is this all; the owners of the property, however vile and worthless it may be, have the right to retain counsel at the expense of the sanitary authority. Consequently they often employ the most expensive legal advice available to defend their interests. In this way the legal costs are sometimes greater than the value of the property; and in practice the cost of expropriation is likely to prove prohibitive. The length of time which the arbitrator takes to investigate the claim, the costs incurred by the owners of the condemned property, result in so heavy an outlay that the whole scheme is handicapped at the very commencement, and the hope of financial success rendered doubtful. Obviously, condemned property should not be treated in so lenient a manner. If a property is in a good condition and does no one any injury, and yet the owner has to be expropriated so as to make room for some public works, thoroughfare or other improvement, the desire to treat such an owner fairly and generously can be understood and approved. But where the owner so far fails in his duty to maintain the property in a sanitary condition that it becomes unfit for human habitation, and the sanitary authority have to go to the trouble of taking this property over so as to pull the bad houses down and build good houses in their stead, the claim to full compensation does not hold good.

At Manchester, however, everything indicates that the law costs will be so heavy and the compensation given to the owners of the property so liberal that the sanitary reformers will be discouraged and the scheme will not be followed up. The actual scheme will of course be carried out, but the rehousing of some 2,000 persons out of a population of more than half a million, will not very materially contribute to reduce the Manchester death-rate. It was, above all, the effect that this scheme would have on the owners of bad property which promised to produce such good fruits. If, on the one hand, the owners of the condemned dwellings had been expropriated at a comparatively small cost and at some loss to themselves; and if, on the other hand, the property thus municipalised proved a source of income to the town, then the threat of treating other property in the same manner would indeed serve as a sword of Damocles, and terrorise speculators in bad property and make them put their houses in order. As it is, such persons will not care for the threats of the sanitary authority. They will know that these threats are not likely to be carried out on account of the great expense, and that in any case they will get good compensation. Thus the poor of Manchester will continue to be badly housed in spite of the large sum the municipality is now expending.

Yet the difficulty of dealing with such an area as that we inspected ought not to be great. There can be no possible hesitation as to the necessity of pulling it all down. The entrance, for instance, by a particular court, presents a most deplorable picture. The houses on either side of this court, though facing the main road, are so old and dilapidated that there is not a straight line remaining. The floors, the steps, the gable of the roofs, the frames of the windows all slant in different directions, and have ceased to be horizontal with the street or the foundations. The passage or court is a yard wide, and across are beams and planks, so placed as to prevent the houses on either side from falling in upon each other. Alone they could not stand, and yet they are inhabited. Beyond the court passage there are some very small two-roomed houses, these rooms measuring 845 and 847 cubic feet of space each. Who can say how many persons have slept at one time in these

very small houses? The statistics of the number of inhabitants were taken long after it was known the district was about to be condemned. Every preparation had been made for the inspection, and it was carried out during the day, so that there was no reliable knowledge gained as to the overcrowding. Yet, even under these circumstances, seven inhabitants were found in two rooms measuring in all 2,645 cubic feet. The space in the bedroom was only 1,210 cubic feet, so that if they all slept together there would be but 174 cubic feet each. Another house of two rooms, measuring 1,104 and 1,305 cubic feet, was occupied by two families numbering six persons in all. The inside space in one house was only 1,690 cubic feet, and there were four inhabitants; next door the house measured 1,694 cubic feet of space, and had five inhabitants. It may be argued that this makes a little more than 300 feet for each person, which is sufficient under certain circumstances, such as in a dormitory with efficient ventilation and little or no furniture. But these houses contain lumber and furniture and sometimes a hawker's stock-in-trade. The breathing-space is thus very considerably reduced. Some of the inhabitants are Italians—organ-grinders and penny-ice dealers. What the condition of ices made in such courts must be had best be left to the imagination. Other inhabitants are very poor labourers, and of course the habits of this class of tenants do not tend to improve the property. The scenes of misery, of squalor and of dirt to be witnessed within these small, ricketty houses are truly appalling. The dirt and despair of the one discourages the other, and these tenants will never be raised from their present abject condition till they are removed to better surroundings.

In hopeful contrast with this scene of misery is the exhibition in one of the rooms of the municipal buildings of the plans and drawings for the rebuilding of this rookery. A competition has been organised for the best scheme for the artisans and labourers' dwellings that are to be built by the town on the condemned area. These plans are replete with all manner of conveniences, even of luxuries and artistic attractions. Thus one designer carefully provides sills on all the windows for the cultivation of flowers. On each floor there are shoots for coal and for rubbish. On the roofs there are terraces. There are separate, well-ventilated, well-flushed water-closets for males and females. There are hot and cold water baths, recreation grounds and gymnasium. Special inlets and outlets for the ventilation of rooms are provided, independently of the opening and shutting of windows or of doors. In fact the projects exhibited suggest what will be considered a working man's palace when compared with the existing slum. Such a transformation should be hailed with joy and hope by those who have at heart this great question of the housing of the poor, and perhaps, by promptly exposing the dangers and obstacles that are in the way of thorough and widespread reform, the results may be more favourable than we are at present tempted to anticipate. In any case, it is very necessary that the sanitary reformers at Manchester should not be content to rest on their laurels; otherwise, the improvement about to be realised, the scheme now sanctioned, may be utilised, not as an example to secure other and greater progress, but rather as a scarecrow to frighten the ratepayer and prevent further attempts being made in a similar direction.

THE LONDON COUNTY COUNCIL OFFICES.

THE report of the Offices Committee of the London County Council announces that advantage has been taken of the electric current having been introduced into the office for the lighting of the council chamber, to light by electricity certain of the rooms in the offices in which better means of lighting were much needed. Benefit having been derived by the adoption of the electric light in these rooms, other rooms are now about to be provided with it. Arrangements have recently been made for the better protection of the county hall at night. A fireman is now on duty each night, and patrols the buildings at certain specified times. With a view also to speedy assistance being rendered in case of fire, telephonic communication has been established with the headquarters of the fire brigade. No additional premises have been taken during the past year, but the committee are now in negotiation for the premises No. 31 Spring Gardens, which the special committee on water supply and markets request should be taken in connection with the work relating to the water supply. The request is supported by the main drainage and the bridges committees, who state that the chief engineer urgently needs additional accommodation to enable him to carry out the work of those committees in connection with the new survey of sewers, and the preparation of the contract drawings for the Blackwall Tunnel.

The committee had still before them the resolution of the Council of January 28, 1890, referring it to the committee to consider and report as to acquiring a suitable site for a council chamber and offices, having also regard to any site which already has erected upon it buildings of a character likely to be available for the purpose. The subject has from time to time received the careful consideration of the committee. In the committee's report of last year it was stated that communications had been entered into and a conference held with the City Lands Committee, with reference to the vacant land on the Embankment belonging to the City Corporation; but that the committee had found, however, that until the Council had passed a definite resolution that a site should be acquired for a council chamber and offices, it was not in a position to enter into practical negotiations for the purpose. Acting upon the resolution of the Council passed on January 28, 1890, the committee again approached the City Lands Committee on the subject of the site, and, after a conference with that committee, came to the conclusion that the price asked was too high to justify a recommendation being taken up to the Council in favour of the acquisition of the whole or any portion of the vacant land. Through another channel the question of this land has again been brought before the committee, but no further practical negotiations have taken place. Other sites have been brought under the notice of the committee, and among them are the following—(*a*) Christ's Hospital, (*b*) Site near the British Museum, (*c*) Millbank Prison. Careful consideration was given to each of these sites, but the committee came to the conclusion in each case that the site was not a suitable one for the purposes of the Council.

STANDARD MEASURES.

IT has just been discovered, says the *Times*, that the standard yard and certain other measures and weights supposed to have been lost when the Houses of Parliament were destroyed by fire in 1834 are still in existence. For over half a century they have lain in the Journal Office almost unnoticed, and but for some inquiries recently set on foot by Mr. Bull, the chief clerk, respecting the present standards, they might have remained unnoticed for a much longer period. A reference to the contemporary records shows that after the fire the standard bars of 1758 and 1760 were found among the ruins, "but they were too much injured to indicate the measure of a yard which had been marked upon them." The principal injury to both of the standards was the loss of the left-hand gold stud, but whether this was caused by the action of the flames or otherwise is not known. When the Palace of Westminster was rebuilt the two bars were deposited in the Journal Office, and, until brought to the notice of Mr. Bull last week, they appear to have rested in obscurity amongst a quantity of lumber. On Tuesday they were examined by Mr. Chaney, the Superintendent of Weights and Measures; and on Wednesday the Speaker visited the Journal Office for the purpose of inspecting them.

The chain of incidents which led up to the identification of the old standards is peculiar. About a fortnight ago it was stated in the lobby that one of the duties of the Speaker was to inspect once in every twenty years the standards immured in the sill of the lower waiting-hall. Inquiries at the Standards Department of the Board of Trade elicited the fact that, so far from any statutory requirements being imposed upon the Speaker in the direction indicated, section 35 of the Weights and Measures Act, 1878, which provides for the care and restoration of the Parliamentary copies of the imperial standards, specially exempts the walled-up copy from periodical inspection and comparison. It transpired, however, that in 1871 Speaker Denison took cognisance of the standards, and the natural assumption was that Mr. Peel, who is ever anxious to keep up the traditions of the House, would follow the example of his predecessor. The Speaker's attention was called to the matter; but the ordinary records giving no indication of the procedure adopted by Speaker Denison, and Mr. Palgrave having only a vague remembrance of the circumstance, Mr. Bull was asked if he could throw any light upon the subject. Mr. Bull was unable to discover any reference to Speaker Denison's inspection, but in the course of his inquiries one of his subordinates mentioned that when the contents of the Journal Office were recently transferred to the new wing he noticed amongst the lumber some old weights and measures. These proved to be the missing standards referred to above.

The most important of the standards thus rescued from oblivion are the yard measures constructed by Bird in 1758 and 1760. The former was copied from a bar in the possession of the Royal Society, which was itself a copy of a standard preserved in the Tower, and the second was constructed under the directions of a committee of the House of Commons from the 1758 standard. "Each of these two standard yards consisted of a solid brass bar 1·05 inch square in section and 39·73 inches long. Near each end of the upper surface gold pins or studs 0·1 inch in diameter were inserted, and points or dots were marked upon the gold to determine the length of the yard." The other standards in the custody of the Journal Office are two brass rods answering the description of the old Exchequer yard, and four weights supposed to be certain of the "copies,

models, patterns and multiples" ordered by the House on May 21, 1760, "to be locked up by the clerk and kept by him." The most important weight—the standard troy pound—is not amongst those now brought to light.

Correspondence

The Congress of Hygiene and Demography.

SIR,—As President of the Architectural (No. 6) Section of the International Congress of Hygiene and Demography, which will be opened by the Prince of Wales on August 10, may I be allowed to appeal to members of the profession generally to give their support to the Congress by attending the meetings of our section as largely and as frequently as possible, and by taking part in the discussion of the various interesting subjects which will be brought forward. As the programme of these has already appeared in all the professional journals, I need not now repeat it, but I may remind your readers that the meetings of the section will be held daily at 10 A.M., from Tuesday the 11th until Friday the 14th inclusive, in the West Examination Hall of the University of London, Burlington Gardens. Tickets of membership, which will entitle the holder to a copy of the "Transactions" and admission to some of the social receptions, can now be obtained at the honorary secretary general's office, 20 Hanover Square.—Faithfully yours,

ARTHUR W. BLOMFIELD.

8 Montagu Place, London, W.: July 21.

Sculpture in England.

SIR,—Having spent much time and effort in procuring data concerning equestrian monuments, it has occurred to me that the readers of *The Architect* might be able to furnish me with facts and illustrations concerning any piece of equestrian sculpture not enumerated below which exists in the British Islands; and that, as the matter comes somewhat under the classification of curious information, you might be willing to publish in *The Architect* the following list of sculptured subjects, concerning which I have already gathered the necessary material. Patient research on this side of the Atlantic has disclosed the fact that the following complete works are still to be found in England, namely, in London:—"Richard I.," by Marochetti; "Wellington," by Boehm; "Wellington," by Chantrey; "Charles I.," by Lesœur; "George III.," by Wyatt; "George IV.," by Chantrey; "Prince Albert," by Bacon; "William III.," by Bacon. At Aldershot—"Wellington," by Wyatt. At Windsor—"Charles II.," by Strada; "George III.," by Westmacott; "Prince Albert," by Boehm. At Bristol—"William III.," by Rysbrach. At Hull—"William III.," by Scheemaker. At Liverpool—"Prince Albert" and "Queen Victoria," by Thornycroft; "George III.," by Westmacott. At Halifax and Wolverhampton—Copies of Thornycroft's "Prince Albert." At Durham—"The Marquis of Londonderry," by Monti. At Chester—"Marshal Combermere," by Marochetti; "Hugh Lupus," at Eaton Hall, by Watts.

In Scotland there are these:—At Edinburgh—"Wellington," by Steell; "Charles II.," sculptor unknown; "Prince Albert," by Steell; "Earl of Hopetoun," by Campbell; "Alexander and Bucephalus," by Steell. At Glasgow—"Wellington," by Marochetti; "William III.," unknown; "Prince Albert" and "Queen Victoria," by Marochetti.

In Ireland there are:—At Dublin—"George I.," by Van Ost; "George II.," by Van Ost; "George III.," unknown; "William III.," unknown. At Belfast—"William III.," by Hems.

To these portrait groups may be added the following subjects, more or less dependent on imaginative effort:—"A Moment of Peril," South Kensington Museum, by Brock; a group of "Huntsman and Hounds," at Eaton Hall, by Smith; "Perseus and Andromeda," on a fountain at Witley Court, by Forsyth; the two monuments to General Ponsonby, by Baily, and General Abercromby, by Westmacott, at St. Paul's Cathedral; another group contains, "Clydesdale Stallion," at Luton Hoo, by Boehm; "Doncaster and Groom," at Eaton Hall, by Boehm; "King Tom," at Mentmore Park, by Boehm.

Groups which have never been carried any further than the model include:—"Lady Godiva," by Birch; "The Mourners," by Lough; "St. George and the Dragon," by Boehm; "Lady Godiva," by Thomas; "Wellington," by Adams.

And the following models made for the Blackfriars Bridge competition:—"Edward, the Black Prince," by Story; "Richard I.," by Brock; "Edward III.," by Armstead; "Cromwell," by Pinker; "Edward I.," by Thornycroft; "Edward III.," by Brock; "Henry V.," by Birch; "Edward, the Black Prince," by Belt; "Richard II.," by Pinker; "Sir Robert Fitzwalter," by Adams.

To these should be added the casts in the Crystal Palace of:—"General Outram," by Foley; "Francis I.," by Clésinger; "Colleoni," by Verrochio; "Queen Victoria," by Marochetti; "St. George," at Prague.

And there should also be included the "Caligula," in the British Museum; "The Tomb of Malaspina," at South Kensington; a copy of "Marcus Aurelius," on the arch at Wilton House.

If any of your readers can help me to complete this list of executed or unexecuted work I shall be extremely beholden to them, and shall not scorn information concerning statuettes, such as "The Last Call," by Birch; or bas-reliefs, such as the group of "Hercules and the Horses of Diomedes," on the Mews at Buckingham Palace; or such mortuary memorials as the bas-reliefs of the "Queen's Ninth Lancers," at Exeter Cathedral; or that in honour of the "Crimean Cavalry," in St. Paul's. Information concerning equestrian sculpture that has passed out of existence would also be welcomed by—Your obedient servant,

WM. ROTCH WARE.

Office of *American Architect*,
211 Tremont Street, Boston.

GENERAL.

The Awards to the exhibitors at the Jubilee Art Exhibition at Berlin comprise seventeen large and seventy-three small gold medals. Among the British artists who have received the large gold medal is Mr. A. Waterhouse, R.A.

Mr. J. H. E. Partington, according to a correspondent of the *Manchester Guardian*, has been appointed to the position of Art Director to the National Gallery of the Colony of Victoria, Australia, at a salary of 600*l.* a year, rooms provided, and the right of private practice. Since Mr. Partington left Manchester with his family he has been residing in San Francisco.

The "Standard" says:—Professor Encke, the sculptor, has finished the model of the intended statue of the Empress Augusta, which is to be placed in the mausoleum at Charlottenburg.

Mr. Whistler has been at work lately upon a large and interesting series of drawings in pastel for exhibition.

Royal Academy Architectural School.—The following students have been admitted to the Upper School:—Messrs. H. C. Corlette, J. Paxton, J. S. Stewart, A. F. Usher, and E. W. Wonnacott. Messrs. E. R. Barrow, H. Bulman, A. J. Forge, A. Hill, C. O. Law, H. Tarbolton and J. H. Tyars have been admitted as Probationers.

The Mosaics of the church of St. Christopher discovered at Kabr Hiram, near Tyre, by M. Renan in 1863, are now being placed in the Mollieu Room of the Louvre.

"General" Booth stated at a departure meeting in Exeter Hall on Tuesday that it was proposed to take a site at 10,000*l.* a year rent on which to build a great "International Salvation Army Temple," at a cost, in round figures, of 200,000*l.*

Mr. Bousfield (of the firm of Fox & Bousfield) sold by auction, at the Mart, Tokenhouse Yard, on Wednesday, the site of the church of St. Olave, Jewry, together with the fabric thereof, for the sum of 22,400*l.*

The south-west portion of the Bishop's Palace, Elgin, adjoining the cathedral, one of the most interesting of Scottish ruins, has collapsed. The palace was lately handed over by the Dowager-Countess of Seafield to the Town Council.

The Old Custom House in Greenmarket, Dundee, an example of the architecture of the sixteenth century, is being demolished by the Police Commissioners, in consequence of the building being in the line of a projected new street.

A Bazaar has been held at Ellon in aid of the building fund for a Volunteer and Public Hall, proposed to be erected at a cost of 1,000*l.*

The Subscriptions to found a cottage hospital for Galashiels and the district have reached 2,120*l.*, and it is expected that 3,000*l.* will be obtained before the books are closed.

In View of the damage done to churches lately by lightning, the Dean and Chapter, to protect the tower of Gloucester Cathedral, have fixed a rope wire conductor to the south pinnacle of the tower.

Paignton Promenade Pier, which was constructed in 1879 at a cost of 10,000*l.*, has lately been sold by public auction. The biddings started at 3,000*l.*, and the property was knocked down for 3,700*l.* to Mr. Jasper Bartlett.

Sanction has been given by the Edinburgh Dean of Guild Court to St. Cuthbert's and Dean School Board to erect a new school at Comiston Road to accommodate 600 children. The cost of the work, the plans of which have been prepared by Mr. Robert Wilson, architect, 3 Queen Street, is estimated at 8,900*l.*

The Architect.

THE WEEK.

The decision in the House of Lords on Tuesday determines one of the questions which the Employers' Liability Act left open, and which has puzzled English and Scotch courts; that is to say, what rights are gained or lost by "common employment." In modern building construction sub-contracts and quasi-independent contracts cannot be avoided, and as accidents may happen in connection with them, questions of responsibility arise. Heretofore, owing to the uncertainty of the law, settlements have been made by the evasion of the main principle. Thus, when a sub-contractor's man has been injured through some neglect that under ordinary circumstances could be attributed to the general contractor, compensation has been given in the form of charity, a receipt being secured that was entirely expressive of gratitude for a favour conferred. When the accident was even remotely chargeable to the sub-contracter, there was less difficulty about settlement—that is, assuming he was able to pay, for sub-contractors generally are considered as interlopers, and they wish to avoid anything which is likely to excite prejudice among the contractor's men. As regards the chances of an accident, they may be considered as being against men who work on sub-contracts. In the case before the House of Lords the accident was caused by the fall of a bucket containing concrete, which was being raised by a sub-contractor's workman, and the man who was injured was employed by the general contractor. He brought an action against the sub-contractor, and a jury, looking at the facts of the case, awarded 52*l.* 10*s.* The Divisional Court set aside the verdict on the ground of common employment, and that view was confirmed by the Court of Appeal. However, the House of Lords came back to the original decision, and the award of the jury was upheld.

It is difficult to reconcile a builder's or workman's idea of common employment with that which has been held by the majority of judges. In ordinary cases of employment it is assumed that a workman is able to measure the risk he runs, and his pay thus represents that risk as well as compensation for labour. If he sees defective plant, or has to do with overseers that are careless of the consequences of incurring danger, the law supposes he is free to seek safer employment. He has had opportunities to gain knowledge of the men and things that he has to deal with, and if he remains indifferent he is not to expect that protectors will be found for him. The Courts cannot treat men as if they were mere bales of goods, and a good deal of the disappointment which follows actions under the Employers' Liability Act arises from the plaintiffs discovering that they are held to be free agents and competent to avoid danger to themselves. But in the cases of their working on sub-contracts all the conditions are changed. There is mutual ignorance. A workman who may be employed for many weeks on a building discovers suddenly that a sub-contractor or specialist is beginning operations. How is he to test the risks which are introduced? The work may be novel to him, and he is not permitted to interfere with it in any way. On the other hand, the sub-contractor's men are confined within certain limits of space, and they are liable to pains and penalties if they stray elsewhere. There is little or no co-operation between the two sets of men, and not seldom there is ill-feeling. The judges observe that the sub-contractor or specialist is generally paid through the general contractor, and hence assume that the former is only a sort of director or foreman for a temporary purpose. But it is not easy to understand how arrangements (which are often fictitious) between general and sub-contractors can affect men who have no cognisance of them. This is the view taken by the House of Lords, and it is satisfactory for many reasons. It is quite enough for an employer to be responsible to his own employés, and for the latter to avoid the risks which arise in their own business.

In the *Daily Graphic* of Tuesday, the 28th inst., are three drawings in connection with the proposed extension of monumental space at Westminster Abbey. In one Mr. H. P. Burke-Downing has delineated in his clever characteristic style the memorial chapel as proposed by Mr. J. L. Pearson, R.A. Mr. Seddon's scheme comes next, and in the third place a plan of the Abbey and precincts, showing the alternative sites for a proposed monumental chapel. Mr. Downing concludes the note that accompanies the sketches by saying:—"If I were one of those for whom the new memorial chapel is being proposed, I would ask no better than to be laid in the cloister garth, though my memory received but a tablet on the cloister wall."

The Rev. Canon Grainger, D.D., of Broughshane, has presented his valuable collection of British and foreign antiquities to the public museum in the free library of Belfast. It will be necessary to build an addition to the free library buildings in order to properly accommodate the collection. The floors of the library, it is said, are not sufficiently rigid to sustain such an additional weight, but there will be little difficulty in introducing stronger beams. The arrangement has commenced, but as it will be necessary to prepare special cases, and the classification will be onerous, some time must elapse before the people of Belfast can enjoy the new acquisitions.

The West Sussex County Council have decided to employ the whole of the money available from beer and spirit duties in aiding technical education. As the Council was the last to come to a conclusion, it is known, therefore, how all the counties will deal with the surplus. The majority will give the money for technical instruction. Gloucestershire, Staffordshire, East Sussex, the North Riding of Yorkshire, Leicestershire and Herefordshire have resolved to use only a part of the surplus for that purpose. Middlesex and the county of London, for the present at least, will not contribute towards technical classes. Nearly the whole of the Welsh counties will also support them. There is no doubt that for a time it will be difficult to produce advantageous results from the outlay. In country districts adults and young people are not disposed to renew their experiences with teachers, and it may be long before a system of instruction is organised which will be at once attractive and profitable to the provincial mind.

It is not often the memorial of a surgeon can have any interest for an artist or a lover of art, but a statue was unveiled on Sunday in the French town Bernay which deserves to be one of the exceptions. It represents Jacques Daviel, who in the eighteenth century was the first oculist in France, and the portrait which was used by the sculptor was produced out of gratitude by one of the patients. Daviel was an expert in the extraction of cataract; in fact, he was the earliest who was able to prove the success of the operation in a great many cases. It happened that a young sculptor named De Vosge was treated by the older method, and one eye became useless. He had recourse to Daviel, and implored his aid. The oculist was then renowned, and could command extraordinary fees. But he took pity on the artist, and succeeded in curing him. The first use De Vosge made of his restored sight was to design a plate, which, after the manner of the time, represented Daviel proceeding to the Temple of Fame, escorted by Genius and Invention. It was from a copy that the sculptor, M. Guilloux, modelled the statue. De Vosge was surpassed by the pupils he taught. One of them was Prudhon, who at a time when revolutions were brewing, produced figures of amorini which neither Albano nor Stothard surpassed. He seemed to live in some ideal world. But the paintings in the Louvre, *Christ Expiring on the Cross* and *Crime Pursued by Justice and Vengeance* are evidence that his master taught him some of the secrets of tragedy. Another pupil of De Vosge was François Rude, the sculptor of the great relief on the Arc de Triomphe, and other works less renowned. A third pupil was Ramey, who executed some of the sculpture of the Arc du Carrousel, which has survived the burning of the Tuileries. De Vosge, therefore, may be said to have endowed France with at least two great artists, and without the aid of Daviel that would have been an impossibility.

ARCHITECTURE, MODERN AND INDIAN.*

WE suppose every reader of this page is well acquainted with the shortcomings of the "History of Architecture," by the late JAMES FERGUSSON, and therefore it is not necessary to say much about the volumes. They form a work which could have appeared in no other country but England. The author was an amateur, whose study of the art was gone through in India, and who judged all things artistic by an Indian or semi-barbarous standard. His books were addressed mainly to students who were to become practitioners of the art, and yet his ambition was to degrade them and the men from whom they were likely to derive inspiration. But in England people are tolerant, and the books in which his extravagances were most marked brought him most profit. Those that were intended for the instruction of Indians and English officials in India were failures. FERGUSSON of Calcutta was not a name to conjure with, even when the subject was as simple as caves or "topes."

In England a man who sets up as an oracle somehow finds believers among people who are wiser than himself. When FERGUSSON declared that all Europe could not show a single architectural building erected in post-Reformation times that was perfectly truthful, men who were well acquainted with the towns of Europe dared not demur to the statement. When he contrasted Indian methods of building with English, and announced that "in the East men still use their reason in speaking of art and their common sense in carrying their views into effect; they do not, as in modern Europe, adopt strange hallucinations that can only lead to brilliant failures; and in consequence, though we may feel inclined to despise their results, they are perfection itself compared with what we do, when we take into account the relative physical and moral means of the Asiatic and the Anglo-Saxon," he so captivated statesmen in authority that he was appointed "Inspector of Public Buildings and Monuments." Happily, he was not allowed many opportunities to introduce Indian methods in building works. Nor so far as is known did he agree to accept an Indian rate of remuneration for his valuable services, or the pay which satisfied that "extraordinary man," ANGELO GATT, the architect of one of Mr. FERGUSSON'S pet churches in Malta, who for twenty years gave his whole time in return for fifteen-pence a day, while latterly he was blissful with two shillings, which formed a pension and a salary.

GATT and great artists like him are the heroes of Mr. FERGUSSON'S architecture, for underlying all his attempts at reasoning there is something that is financial. The men who are unworthy of the art, according to his view, are those who are eager to be paid at a reasonable rate for their services. We have only to read between the lines and we can understand why he objected to "a limited and especially educated class of architects," whose "productions are appreciated only by a small class of scholars or archæologists," for, of course, specialists will not work for a handful of rice or a few pence. To the FERGUSSON mind, on the contrary, what does it matter if in a public building "the pillars were one diameter more or less in height, if the proportions of the entablature were altered, and even if the cornice were half or twice its proper projection," so long as cheapness is secured? The ideal building is one like the cathedral at Boulogne, which a simple Abbé erected and which a FERGUSSON could imitate. To an educated man it is admitted the building is "simply horrible," but to the inhabitants "it is a more beautiful building than the Walhalla or the Madeleine, because it has the form of a Christian church, which they understand, and because its parts answer the constructive purpose for which they were designed," to say nothing of the saving which the simple Abbé effected through being his own architect. In writing his history the author showed that he retained the characteristics of the Indian traveller in 1839, who boasted about "the great and wealthy Mr. FERGUSSON" doing everything for himself, down to making his own bed and cooking his own dinner. He was as ambitious to play many rôles as BILLY BOTTOM himself, and architecture he considered was one of the least important, for as he said once, and he was versed in the manipulations of the kitchen, "Identically the same process which makes the difference between a boiled neck of mutton and a dish of *côtelettes à l'Impériale* can convert the most commonplace building, merely designed for shelter, into a palace or a temple." In the pages of his book he tries to show how well he could have acted as a substitute for the most renowned architects since the dawn of the Renaissance, and when criticising he appears to say, "If I could only have had such materials, what a wonderful hash would be produced!"

It may seem puzzling that, with so many defects, the "History of Architecture" should have gained so much success. The reason is simple. The author in almost every page exhibits his deficiencies, but at least he is consistent in what he writes. Mr. FERGUSSON does not bestow blame or praise to order; all his judgments are his own. We may consider him to be over-vain and unqualified for his office, and what he lays down will not sustain examination; yet nobody can doubt that he is honestly inspired. With a different sort of training his critical faculties would have been more fairly balanced, and he might even have lost some of the faith in his own infallibility. Fortunately he was not skilled in the art of explaining the course of his thoughts; he was unable to do more than lay down his law in a sort of bow-wow manner. The student soon learns to detect the weakness, the criticisms are questioned, and if their groundlessness is easily discovered the process is not without use for beginners. It is remarkable how rare are the occasions when anything said by Mr. FERGUSSON about modern architecture is referred to as authoritative. As they grow in experience students lose their faith in him, and his work is more often referred to for its descriptions than opinions.

It was no easy task, therefore, which was imposed on Professor KERR when he was entrusted with the editing of the "History of Modern Architecture," and what he has done reveals the defects of the original. When he says "as regards the original text of the work it has been thought best to make no alteration whatever," it is evident that it was considered hopeless to bring the author's ideas into harmony with the editor's, and the Professor was only true to himself when, as he says, "he confined himself to the task of introducing occasional comments, with the object not of correcting the author, but of accommodating his bold and forcible opinions to the modified thinking of the present day, and perhaps to the practical experience of the working architect." The advantage of the arrangement is that Professor KERR in his numerous additions is enabled to express his own opinions frankly. He does not act after the manner of the modern showman or "illustrator," who tries to discover all that can be said in a limited time in support of his subject, and who passes lightly over all that is apparent on the other side. Professor KERR does not forget the duty that he has incurred, but while very courteous to his author, he never ignores what is mischievous in the volumes. In consequence the pages now seem to be inspired by two opposing spirits. One is very bumptious, with the narrowness that comes from self-formation and a tendency to exalt conclusions from immature data into universal truths; the other is less confident by reason of a wider experience which shows that theories, like men, must undergo changes. Mr. FERGUSSON, as became a man who was spoiled by his family, by servants that were little better than slaves, and by sycophants who were rather worse, appeared to think he was a born legislator, and the world would not go right until there was a clean sweep of everything he disliked and a reconstruction under his own superintendence. Although his writings, as we have said, were never accepted for guidance, yet we believe that indirectly his manner of criticism has had a pernicious effect on many students. Professor KERR, on the other hand, who in his day was not sparing of criticism, evidently now believes that when it is one-sided it is not a profitable indulgence, and the following bit of advice will, it is to be hoped, serve as a corrective for many of the pages of the history:—

> It would be useless and only what is called old-fashioned, or even pedantic, to pretend now to criticise by means of academical canons the artistic merits of current examples: the prodigious cultivation of the picturesque has ruined criticism. The only thing, perhaps, that

* *History of the Modern Styles of Architecture.* By James Fergusson, D.C.L., F.R.S., &c. Third Edition. Revised by Robert Kerr, Architect. London: John Murray.

History of Indian and Eastern Architecture. By James Fergusson. London: John Murray.

may be safely attempted for the present is the enforcement of broad precepts of obvious propriety. That every building ought to be most carefully devised and organised for the strict fulfilment of its purposes of occupation is the very first point; and here the occupants must generally be allowed to be witnesses. This rule, moreover, will be found to reach a great deal farther than most of our artistic architects may suppose. The frank acceptance of such forms and features of conventional art as shall be perfectly appropriate, straightforwardly truthful, and unaffectedly graceful, may be relied upon as another rule; and especially that the common sense of the many should not be outraged by any uncommon sense of the few. Intoxicated architecture may always be rejected; ambitious architecture may be at least regarded with suspicion; paper architecture is worthless—that in which the fascinating touch of the draughtsman is the chief or sole source of pleasure; quaint or funny architecture is almost invariably a delusion, concealing the architect's want of care or want of genuine skill. Science never jests. On the other side of the question, however, we ought, even in this kind of criticism, to cherish liberality of feeling, and, if only as matter of expediency in such unfavourable circumstances, forbearance and modesty in delivering an adverse judgment. Who are the critics whose laugh has been loudest in our day? Not the most learned students in the libraries, not the most able craftsmen in the studios. The pen of the ready writer in censorship, especially that of the amateur, is all too ready to run away with its master. The more we cultivate that generosity of judgment which pertains to elevated thought, the sooner our coming canons of taste will come. Error on the safe side in this particular matter is not reluctance to admire, but unwillingness to blame. Leaving out of account, of course, that which is unmistakably otherwise, let us always bear in mind that the work before us has cost its author pains, that his aim has been to please us, and that every blade of grass, however feeble, helps to make the swathe of hay.

The English section of the History of Modern Architecture was closed by its author at a time when Gothic was in the ascendancy, although the laity seemed to prefer the Classical styles. Mr. FERGUSSON's hope was in the reappearance of "a *tertium quid*, a style which, for want of a better name, is sometimes called the Italian, but should be called the Common Sense style." As we know, that consummation continues to be devoutly wished for. Professor KERR does not take up the historical narrative after the completion of the Houses of Parliament and the erection of the Museum at Oxford, which exemplified Ruskinism when strongest. He sees in work of the present day, in our latest form of architecture, that the crafts are not only employed, but sometimes become supreme, and therefore he turns back to the Hyde Park Exhibition of 1851, when they were first allowed to assert themselves publicly, and sculpture alone among fine arts became admissible because it was supposed to be allied to them. Here is a passage in which he shows the effect of industrial art at large:—

The most promising course to adopt in any attempt to trace the progress of architecture throughout the world in the Victorian era would be to note its condition in each of the great communities at the year 1851, and from thence to follow its local progress with express reference to *industrial art at large*, comprehensively, popularly and non-academically. As regards England the consequence of such a study must be this. We soon leave behind us the constrained and pedantic "Fine art of Architecture" of the academical books, applying itself to certain accepted kinds of the dogmatically-glorified building, and to nothing else. We find ourselves in a far wider sphere of influence. The very formula of Royal Academies—the Renaissance formula of "Painting, Sculpture and Architecture"—changes its significance. Architecture, more especially, steps down from her academic pedestal and welcomes to her embrace a whole family of non-academicals. "Minor arts" is what they have been called hitherto, supplementary arts, subsidiary arts and so on, mere ornamental and decorative arts, inferior arts, commonplace industries. *Architectural art* now embraces them all, no longer of unequal dignity with herself, but of altogether equal and similar comeliness of grace. Bone of her bone, indeed, and flesh of her flesh, they group themselves, as they have always done, around the ancestral central art of building, but they are constituents now and colleagues, not poor retainers and subordinates. We have only to think for a moment of the generous philosophy of this unity, and what must follow is precisely what we see. The English architect of to-day has for his fellows and fellow-workers no longer the dainty dilettante only, or the pious ecclesiologist, but all those popular handlers of the pencil—the same pencil as his own—the decorator, the colourist, the ornamentalist, the glass-painter, the modeller, the carver, the statuary, the metal-worker, the furnisher, the tissue-worker, the clay-worker, the plaster-worker—in short, the whole order of those designers who produce *art architectural*, amongst whom he is sufficiently proud to be, as his name implies, *Architectus* only, technical chief.

If Mr. FERGUSSON could have his way architecture would be an art without artists, or at least any that were acknowledged. As a gourmand he would argue that it was only in exceptional cases a cook was allowed to associate his name with a sauce of his invention, and why should architects gain credit and fame for combinations of forms which they had not originated? That history is the record of what was said and done by individuals, and that the individual element cannot be too prominently expressed, he could not admit as being true in architecture. Mr. FERGUSSON wished to ignore the architect while considering his work. He complained "that hardly any one has attempted to write a continuous history of the Renaissance styles of architecture, but VASARI, MELIZIA, DE QUINCEY and many others have written the lives of the most eminent architects," and, while admitting that such "lives" found readers, he added, "it is only so because the art is cultivated on mistaken principles which can never conduce to progress or lead towards the attainment of perfection." In order that the reputation of architects might be effectually suppressed, Mr. FERGUSSON set up the wonderful theory that their art, in common with tailoring and cooking, was a technical art in which men served as substitutes for machines, while it is only in the phonetic arts that authorship was of importance. In technic arts such as architecture "the individual is nothing, the age everything; if a giant does occasionally appear he only makes a rapid step in advance, which would be accomplished as certainly, though more slowly, by ten dwarfs." Professor KERR has no rancour to gratify by undervaluing architects, and in his additions he endeavours to counteract the defects of the original work by showing, as far as space allows, the relations between the idiosyncrasies of an architect and his buildings. The following estimate of two prominent Gothicists will suggest his method:—

Burges and Street were men of a highly artistic temperament, but they were as unlike each other in every way as any two such men could well be. Burges was personally very much of a Bohemian, whimsical to absurdity, paradoxical, pedantic and perverse, but possessing singularly refined powers of elegant, contemplative, and what is called poetic design, with a leaning towards nicknackery. Street, on the contrary, was robust, bigoted and domineering; a solemn fighter, armed *cap-à-pie*, and with no weakness at all—except excess of strength be weakness—having a positive disgust for the elegancies and graces, and a sort of delight in architectural uncomfortableness, which it was impossible not to admire because of the vehemence of it as an act of sacrifice. Both had a radical and contemptuous distrust of the nineteenth century in respect of all its ways and works, but their conceptions of the thirteenth or fourteenth were essentially different. Street might have been a building abbot, ruling with a rod of iron, if ruling well, or a building baron, sealing his delineations with the hilt of his sword; while Burges would have been neither priest nor warrior, but some eccentric wandering star of infinite jest and humour. That Burges was the more refined artist the majority of pleasant people will probably maintain; but that Street was more grand there will be some hard-mouthed admirers of the severities of art with equal emphasis, or even more, to affirm. At any rate, Burges loved the amenities and sunshine of Mediæval art, Street its austerities and clouds. That they had a pretty correct appreciation of each other's shortcomings need scarcely be said; they were always competitors, never comrades, both great architects.

All portraiture is affected by the authorship, and it does not follow necessarily that all the touches in the foregoing are true to nature. But we maintain that it is a better aid to students who wish to understand what are the qualities which differentiate STREET's work from BURGES's than if told that "our present mistake is, first, in insisting that our architects must be archæologists, and fancying, in the second place, that a man who has mastered the science is necessarily a proficient in the art." Professor KERR gives a sketch of another remarkable man who, like BURGES, and in spite of what Mr. FERGUSSON asserts, failed to convince the bestowers of commissions that a mastery of science and an enthusiasm for archæology could coexist with proficiency in the art and practice of building:—

Fergusson used to say of Digby Wyatt that he had never seen his like in this very remarkable respect:—Give him any conceivable subject of architectural work, and dictate to him any style you pleased, he could without a moment's hesitation sketch off a design in all its detail which would be perfectly correct and perfectly complete. In other words, his mind was a storehouse of all the knowledge that was to be obtained from travel and the books. This could be said of him, moreover, with reference not to academical architecture alone, but to Architectural Art in the widest sense, embracing all the supplementary and subsidiary arts that could be named. Speaking more strictly, however, it was his knowledge of academical Renaissance Art in all its departments that was so intimate, and he only added to this for its own sake a similar but of course not equally profound appreciation of the most approved examples of other schools—a little Gothic included, but not too much. Academical he was to the core, but his academicalism was so broad that it was practically of the same revolutionary character as Coles's democratic republicanism of artisanship. With all "the industrial arts" at his fingers' ends, despising none,

almost preferring none, here was the very man Cole wanted, a loyal and tractable man also, and not a vain man like too many of such artists, glad of the opportunity to exert himself and to earn honour more than money. Years afterwards, when he asked the Metropolitan Board of Works to give him a District Surveyorship for a living, his testimonials, it is said, made such a grand array as to frighten the members; they would have nothing to do with so glorified a candidate, and he never applied again; but he eventually obtained the better appointment of architect to the East India Company; and if Sir William Tite, who took up the matter, had not, in his own rough way, done many another handsome thing, his action in this ought to be allowed to cover a multitude of sins of the more commercial order.

It must not be supposed that Professor KERR is one of those zealots who profess to believe that under no circumstances can an architect go wrong. There are, unfortunately, too many men of that class, each of them being convinced that when he blunders it is the bounden duty of all architects to come to his aid by maintaining, against the world, that so long as an architect is not dissatisfied with what he does, clients and the world in general have no right to interfere. Professor KERR takes one case which affords as good a text for a sermon to young architects as could be found: it is that of the new Post Office in the City which stands opposite SMIRKE'S building, and was designed by Mr. WILLIAMS, of the Office of Works. The Professor says:—

Most architects were offended when that important edifice was not only projected without a competition, but carried into execution without any architectural direction, except that of the unconspicuous officials of the Public Works Department. It was pronounced, even by the most moderate men, to be an opportunity thrown away. Now the exterior design is certainly not of those polished artistic proportions which would have cost nothing but pains and skill. The interior may perhaps be worse in that respect than the exterior. But compare the building as an organic device with the old Post Office on the other side of the way, a work of which Sir Robert Smirke was considered to be justly proud, or with the same architect's British Museum, or with Barry's Houses of Parliament, or with Street's Law Courts. In each of these cases, how much of the common sense of careful disposition and expressive appropriateness, of the repose of usableness, of the indescribable completeness of perfect convenience, has been deliberately and (as many very good people would plainly say) maliciously compromised for the sake of—what? No one knows what, except academical architects, and even they are not of one mind about it. In a word, the idea that has become fixed in the minds of such men of business as are at the head of our national affairs seems to be very much like this—that an architect, when entrusted with any important work, begins at the wrong end, and, as an inevitable consequence, misses the proper object of the enterprise; begins with style, fashion, masquerade, histrionics or whatever we may choose to call his perverted desire for spurious display, goes up at the beginning like the rocket and comes down at the end like the stick. This is, no doubt, putting the case strong, but it requires to be put strongly, for there cannot be any reason why English architects and the English Government should not be able to act in harmony, if the architects will only consent to do their work (as the phrase now goes) scientifically, beginning with the skeleton and ending with the skin.

Nobody will resent plain speaking on the part of Professor KERR, for he knows the state of the profession, and is aware that it is not the Government alone that can complain about the sacrifice of utility to appearance, and the neglect of the comfort of residents for the sake of the occasional admiration of a front by the passers-by. He can be no less severe than Mr. FERGUSSON in dealing with indifference to the real purpose of a building, but unlike him Professor KERR could not have the hardihood to say that when an architect succeeds in producing "one of the best public buildings of the metropolis," that is, the prison of Newgate, it was through "mere ignorance," and that "it was just this amount of ignorance which enabled every village architect in every part of England to produce those perfect churches which our cleverest and best educated architects find difficulty in copying, and scarcely even dream of surpassing!" When a vulgar man does try to become paradoxical, it is astonishing to what depths he can sink.

It is evident from several passages that Professor KERR is no longer in allegiance to academic architecture, and the phrase may be supposed to suggest much that was mechanical if not lifeless in architecture. At the same time he will disappoint many who have also emancipated themselves from academicalism by what he says of Queen Anne. Thus, in one passage he writes:—

The buildings actually executed in the Queen Anne style have been numerous and of all kinds, good, bad and indifferent—mostly indifferent. In commonplace examples, red brick has been the favourite material, and red tiling has been largely added in the form of prominent roofs. Ornamental gables, sometimes of enriched and sometimes of very impoverished effect, seem to be regarded as the leading feature of the mode, with all kinds of dormers by way of supplementaries, as if garrets were the most characteristic part of the accommodation. Huge chimney-stacks, also, are thrust into view with the utmost hardihood, making them often the principal means of investing the composition with artistic merit—surely not of a high order. Wooden bay windows are deemed so essential that they are actually recessed into the wall rather than they should be omitted. Paltry doorways and incomprehensible little windows enter their protest against dignity without, and "nooks" and "ingles," twisted passages, breakneck steps for the sake of the questionable pleasure of surprise, and tipsy arrangements generally, carry out the same scheme of artistic merriment within. Breadth of treatment and repose are understood to mean the introduction of an occasional expanse of ostentatiously plain brick wall, or two or three windowless storeys in a shapeless tower, as a foil to the aspect of pleasantry elsewhere; and when the window-sashes are made like the lattices of a fancy bird-cage, and all the external woodwork painted with the brightest of white lead, after the manner of a doll's-house, the domestic virtue of "the Queen Anne style" is at length fully asserted. In far better work than this, and in the hands of really good artists, the detail is still so coarse and corrupt—for the sake of "quaintness"—that even careful proportions and graceful forms fail to redeem the character of the composition; and it is doubtful whether any specimen of the style above the rank of a country cottage will withstand the commonest criticism twenty years hence. But, nevertheless, there is one respect in which we may accord a certain amount of praise to this singular fashion. The dainty, ladylike, furniture design of some of the interiors is certainly more than pretty; it is minor art *in excelsis*. Whether it is high-class architecture is quite another question; but it fully illustrates the principle that academical pretension is giving way before the advance of the popular appreciation of art, more enjoyable because more simple.

After reading the foregoing extract there is likely to be some doubt about the sincerity of Professor KERR'S conversion, and he has yet to give proofs that he can be loyal to Queen Anne. A style of the kind that is now so much in vogue may be supposed to have advantages, for extravagancies often gain admiration because they are believed to be originalities. Amidst so much competition as prevails in our time there is risk in repetitions, no matter how perfect may be the forms. Clients prefer remarkable to refined details, and even in cheap terraces expense is incurred to secure variety. It would be better if people could be brought to understand what are the limits of architectural design, and for that reason the following remarks by Professor KERR merit general attention:—

The reader's idea of what "copying" means in architectural designs will depend very much upon whether he himself is, or is not, a working designer. To the amateur critic resemblances often appear to be striking which to the experienced artist are scarcely discernible. This is a well-known fact in simpler matters. The average Englishman, who regards himself as a most discriminating observer, thinks all Chinamen are alike. But it is also well understood that the equally self-confident Chinaman thinks all Englishmen are alike, and is even more amused at the likeness. How many intelligent people there are who will tell us any day that St. Paul's in London is almost exactly like St. Peter's in Rome, and was, in fact, "copied" from it, only on a reduced scale! There is no doubt about the circumstance that the Scotch Church in Regent Square, Bloomsbury, a work which Sir William Tite in his very young days won in competition, was considered at the time to be a direct "copy" of York Minster, and so good a copy that even genial Professor Donaldson, half a century later, reminded a large assembly of architects, to their great amusement (it was after dinner), that Sir William had been "the leading Gothic architect of the day." None know better than the leading Gothic architects of the present time how readily their clients and others see resemblances where every effort has been laboriously expended upon the achievement of novelty.

In spite of all the advice that may be given, it is to be feared that many a year must elapse before architectural practice in Europe is unhampered by prejudices which arise from ignorance and those which are caused by the obliquity and preposterous conceit which characterised such men as Mr. FERGUSSON. But in America there is a more open field, and the architects have been able in consequence to advance more rapidly than is possible in England and Europe. Mr. FERGUSSON, who would have the caste system introduced among architects, and who considered that any architect who could read, write, draw and admire plans of buildings deserved severe punishment, had the instinctive aversion of all petty tyrants to American ways. The most absurd part of his book is that relating to North America. It is not only unjust to the Americans but to English readers. Professor KERR offers a special apology for the hasty opinions that have been so freely expressed by Mr. FERGUSSON. The editor traces the progress of architecture in the States during the past forty years, and he takes the view of all careful observers, and

recognises the fact that if the development of English architecture is to be followed America must be included in the survey. But it must not be assumed that the Americans will always be willing to follow a course that is not far apart from our own. There is much to be said in favour of the possibility of such a vision of the future as Professor Kerr opens for us when he says:—

Thoughtful Germans and Italians, and even Frenchmen themselves, are already pleased to express a most significant satisfaction with the art works of the English; and in architecture especially, in spite of our many disadvantages, such approval is by no means grudgingly accorded. "Westward the tide of empire holds its way"—what shall we say of America? Practically the case stands thus:—The leading men in the United States are Englishmen on the other side of a somewhat wide ferry; indeed, New York seems to be much more in touch with London than Dublin is, or even Edinburgh. This being so, let us observe how distinctly the English peculiarities are being emphasised and intensified in the typical Transatlantic character, so that already the doctrine is recognised by leading statesmen and men of affairs that the future of England is best to be foretold by studying the advance of America. May we say that the Gothic vigour of the Teuton parting company with the enfeebled refinements of the Latin, and collecting all its energies at last on this westward island of ours, has simply been forced to bridge the Atlantic for elbow-room, and, amidst the expanding potentialities of a truly new world, where the trammels of tradition are entirely shaken off, is of necessity exhibiting expanded powers? We do not require to look far into the future to see that the next century must work surprising changes in the culture and wealth of the Anglo-American race; and to say that the effect upon the arts—which always follow culture and wealth—must to a certainty correspond, is but a truism. Moreover, no one who looks at the rapid progress which art has been actually making in America since the war can fail to see that the foundations of an American artistic individuality are being already laid, and the names of its pioneers already recorded. For the present the art-students from the great western continent come for their inspiration to England and France, and no doubt they must for some considerable time continue to do so; but just as England has ceased long ago to rely, as it once did, upon the Continent, so may America in due time cease to rely, as it does now, upon Europe. Let us remember, for instance, how the accident (in a certain sense) of the High Church movement brought out in the Gothic revival a wealth of native artistic power which not only was unexpected in other countries, but is still astonishing to true critics amongst ourselves. What is to be the accident in America, and when it is to happen, it is not necessary to speculate upon; if history is to be as history has been the hour will come, and the men. One thing, however, we may at any rate venture to predict:—The new mode of America will not be an effeminate manifestation, but a masculine one.

Enough has been said, we hope, to suggest the value of Professor Kerr's editing. The young student will henceforth be guarded against the errors of the original work, and he will be able to form for himself a more rational notion of architecture as an art and a profession. It is hard to have to expend so much labour in trying to compensate for the wrong done in writing a history without adequate qualifications. There is also a risk that it is labour in vain. So much has to be corrected and qualified, doubts must arise in a reader's mind, and the value of the remainder, or unedited part, is naturally diminished. But if the "History of Modern Architecture" is to be studied, the new edition should alone be used.

There were few temptations before Mr. Fergusson when he was writing the "History of Indian and Eastern Architecture," and hence it is more satisfactory than any of his works which treated of buildings in Europe. It was a great feat to bring into order so much that hitherto seemed chaotic, and the author's reputation is likely to rest upon the volume. Whether his theories of Indian art are all justified remains to be seen, and cannot be determined until the archæological survey is completed and the results discussed. But great credit is due to Mr. Fergusson, and more especially to his publisher, for undertaking so costly a work at a time when the Indian remains were neglected. There is no doubt that through Mr. Fergusson's labours something has been done for the preservation of Indian work, which was too often sacrificed by British officials. Their value in a historical sense has yet to be assessed. We may shut our eyes to their existence, but a history of architecture can only be fragmentary in which their peculiarities are not made plain and brought into relationship with other styles. There may not be much which will bear transference in Indian works, but the account of those which Mr. Fergusson gives in his large volume is like a revelation of a new world, in which building is carried on under conditions that at first sight appear mysterious, but afterwards are found to be as rational as those of the West.

THE VENTILATION OF THE HOUSE OF COMMONS.

THE Select Committee appointed on June 22 to inquire into the ventilation of the House of Commons have prepared their report. The total cost of the suggested alterations is estimated by Mr. John Taylor at 4,735*l.*, the principal items being 2,200*l.* for carrying out the recommendations contained in par. 5, and 1,100*l.* for that contained in par. 7. The recommendations set forth in par. 1 are estimated to cost 250*l.*; par. 2, 250*l.*; par. 3, 200*l.*; par. 4, 10*l.*; par. 6, 300*l.*; par. 8, 100*l.*; par. 9, 300*l.*; and par. 10, 25*l.*

1. The Committee recommend that for the better general ventilation of the House of Commons, including the Debating Chamber, the Committee-rooms, Libraries, Dining, Smoking, Reading, Tea-rooms and corridors, the existing inlets for fresh air drawn from the Terrace be enlarged and altered; and, further, that in order to provide an increased area of intake, the rooms in the basement storey on the river side (eight in number) now in occupation of the Chief Clerk of the House of Lords, and used for the storage of Parliamentary papers, also the adjoining room now in the occupation of the Serjeant-at-Arms of the House of Commons and used as a general store, be made available for the purpose of providing additional air inlets, and that provision for the storage of the present contents of these rooms be made elsewhere.

2. That for the purpose of increasing and improving the supply to the Debating Chamber of air drawn direct from the river front of the building a more powerful air-propeller be provided, and that the existing heating and air-filtering system be rearranged and enlarged.

3. That additional facilities for the admission of air to the Debating Chamber be obtained by making openings beneath the Members' and Ladies' Galleries, so that the incoming air may enter the Chamber through the fretwork at a higher level than at present; while air should also be brought into the Chamber at other suitable points, whereby they believe inconveniences complained of as arising in certain places from draughts may be more effectually prevented.

4. That provision be made for the admission of air at the south end of the "Aye" Division Lobby.

5. That the ventilation of the Committee-rooms be improved by enlarging the existing inlets or by providing additional inlets by means of vertical tubes or perforated flooring, according to the requirements of each room; also that the extraction-shafts, common to all the rooms, be furnished with non-return or back-pressure valves, in order to prevent down-draughts, and that the existing ventilating-furnace arrangements be improved.

6. That the system at present used for ventilating the Committee-room corridor be altered so as to be wholly independent of that of the general ventilation of the Committee-rooms, and that provision be made for the introduction of fresh air beneath the floor of the corridor from the courtyards on the west side, and also for the extraction of the vitiated air through the ceiling and roof of the corridor by means of four upcast or extraction shafts.

7. That double windows be provided for the whole of the Committee-rooms now without them.

8. That means be provided for the admission of air at the inner or eastern wall of the Reading and Tea-rooms, the air to be introduced at a high level instead of as at present from the skirting near the floors of each of these rooms.

9. That the existing water-closets and urinals in the Library corridor be abolished, and that others be provided in the room at the south end of the corridor, now used as a stationery store attached to the Library; the existing doorway to be blocked up, and a more private entrance to be provided.

10. That the ventilation of the serving bar in the Members' Dining-room be improved.

11. The Committee also report that they obtained some evidence on the question of taking the air for the supply of the Houses of Parliament from a high level, rather than as at present from the ground level. The Committee were informed that the former plan was adopted at the opening of the present House of Commons in the year 1851, and was continued in use until the year 1854, when the entire system was reversed, and the Clock and Victoria Towers, which up to that time had been used as down-cast shafts for the admission of fresh air, were altered so as to become up-cast shafts for the extraction of vitiated air from all parts of the building. No specific reason for the change is recorded in the reports of the committees of both Houses by whom the subject was considered, but it appears to have been thought that an improvement in the ventilation of the House of Commons had been effected by the reversal of the system, and a similar course was followed in the House of Lords, apparently after mature consideration.

12. The Committee also took evidence as to the system of drainage of the Houses of Parliament, which was established in pursuance of the report of the Select Committee on the Ventilation of the House in 1886, and they find that the system

works satisfactorily. The Committee are satisfied that the connection between the Houses of Parliament sewer and the metropolitan main sewer is so constructed that no backwater or return of sewage or of sewer-gases from the metropolitan sewer can enter those of the Houses of Parliament; and the Committee are convinced that no offensive smells or injurious emanations now proceed from the drainage system of the Houses of Parliament, which they are of opinion is as perfect as possible.

13. The Committee have also ascertained that steps were taken to approach the Metropolitan Board of Works with a view of obtaining some improvements in the drainage of that part of Westminster lying immediately outside the Houses of Parliament, and that among other remedial measures an attempt was made to ventilate that portion of the low-level sewer which runs close by the Clock Tower, by connecting it with an extraction shaft or outlet of low elevation situated at the termination of the parapet of the Victoria Embankment, where it joins Westminster Bridge; this ventilator, the Committee have ascertained, was, very shortly after its erection, stopped up owing to the complaints of foul smells which pervaded the immediate neighbourhood. The Committee recommend that communication be made to the London County Council requesting that body to consider the desirability of improving the ventilation of their main sewers in the neighbourhood of the Houses of Parliament, especially by the erection of suitable shafts and furnaces in convenient positions to create powerful exhausts, so that the gratings at the ground-level may become inlets for air to the system, instead of as at present outlets for gases from the sewers; the Committee, however, cannot approve of a suggestion made to them that a ventilating shaft should be introduced into and carried to the top of the upcast shaft in the Clock Tower for that purpose.

ST. MATTHEW, WESTMINSTER.

AN application was presented in the Consistory Court of London on Monday by the Rev. W. B. Trevelyan, vicar of St. Matthew, Westminster, and the churchwarden, Mr. Hubert Poole, for a faculty to carry out certain alterations in the church. The petition set forth that it was desired to cut away part of the buttress on the south side of the chancel, and to form archways through the buttresses on the east and north sides of the chancel, in order to make a passage to a room outside the vestry; to erect a new vestry with a chapel over it; and to place a holy table in the chapel for occasional use, the passage thus made connecting the old vestry with the new vestry.

The Rev. W. B. Trevelyan, the vicar, moved for the faculty, and in the course of his evidence said that the church was in Great Peter Street. It had no churchyard, but stood in a small piece of enclosed ground. It was built in 1854, and no burials had taken place in it. A clergy-house had been erected on ground which was to be vested in trustees, and which adjoined the ground surrounding the church. That was on the south side. On the other side of the chancel he wanted to build a vestry and to make an entrance from the south aisle into a chapel which was to be erected above the vestry. The chapel would be entirely separate from the chancel, and there would be steps leading into the west end of the chapel. There would also be another entrance from the clergy house. The vestry would be built on part of the ground which surrounded the church, and the chapel would be placed over it. The chapel would be used generally for private services, and occasionally for early services and communion. The population of the parish was between 8,000 and 9,000. The ground had not been consecrated, but the church had. The cost of the proposed alterations would be about 1,000*l.*, and the money would be forthcoming. The Charity Commissioners were aware of what was proposed, and had raised no objection.

Mr. H. Poole having concurred in the application, the Chancellor said that the Court was prepared to grant the faculty. It would, however, be necessary, as the chapel was entirely distinct from the church, and was to be used on occasions when it was inconvenient to use the church, and as it was intended to place a holy table in it, that the chapel should be consecrated. As there seemed to be no difficulty about that, and as there was no objection on the part of the Charity Comissioners, he would grant the faculty as prayed.

ST. HELEN'S CHURCH, BISHOPSGATE.

ON Monday an application was made by the rector of the united parishes of St. Helen's, Bishopsgate, and St. Martin Outwich, and the churchwardens, for a faculty to carry out certain restorations of their church on plans submitted by Mr. J. L. Pearson, R.A.

According to the petition these plans included the erection of new vestries, the lowering of floors, the repaving of the church, altering the position of the pulpit, the reglazing of windows, and the addition of three windows. The estimated cost was 7,000*l.*, of which the Charity Commissioners were prepared to advance 4,092*l.*

The Rev. J. A. L. Airey, the rector, moved for the faculty as prayed. He said that the Merchant Taylors' Company, the patrons of the living, proposed to give 2,000*l.* in addition to the 4,092*l.* authorised by the Charity Commissioners towards the restoration. There were two chapels now in existence in the church. There was no screen between them, and he did not propose to erect one. There was a communion-table in one of the chapels, which was the old original slab forming the *mensa* of the lady chapel. It was now lying on the floor, and it was proposed to put it on pedestals, and to use it for celebrations at which small numbers of people were present, and for week-day services. In lowering portions of the floor it would be necessary to lower some of the tombs, though they would still remain on their original site. There was one tomb, that of Sir Francis Bancroft, which it was desired to place in the crypt, as it was a great disfigurement to the church.

The Chancellor (Dr. Tristram) said he should like to know what tombs were to be moved. He would inspect the church before the faculty was issued, and would see what tombs they proposed to move, so that there might be in the faculty a special proviso with regard to consent.

Mr. John Codd, manager to Mr. J. L. Pearson, R.A., Mr. T. Rolfe and Mr. E. G. Cherry, churchwardens, having expressed their concurrence,

The Chancellor said that, with regard to the slab, it would be safer to place it on wooden pediments than to use stone for the purpose, as that would keep it within the decision that had been given by the Judicial Committee of the Privy Council. The Court would grant the faculty as prayed, subject to certain provisoes and certain consents. Before the faculty was issued he would inspect the church, so that he might be able to direct what proviso should be inserted. There must be included in the faculty a power to close the church during the restoration, as well as a provision for the publication of banns of marriage, and for certain other matters in an adjoining parish.

CORRESPONDENCE

Westminster Abbey Enlargement.

SIR,—One of the reasons given for its adoption by those members of the Royal Commission who are in favour of the refectory site is so opposed to the principle on which the old monks or freemasons would have worked, that I beg to send you in proof thereof a brief description of the refectory at St. Mary's Abbey, Jorvaux, about two miles from Middleham in Yorkshire.

At Rievaulx the church itself is the conspicuous object. Here at Jorvaux the majestic refectory and domestic buildings stand out in massive grandeur against the surrounding woods. The plan of the church is cruciform, with aisles to a nave of ten bays, and with a choir of four bays; a transept of three bays with east aisle, and a lady-chapel. The cloister court is on the south-west of the nave. In line with the west front is the ambulatory with dormitory above; on the east side is the oblong chapter-house, the kitchen and abbot's lodge; to the south was the noble refectory of seven bays and two aisles.

Sir Walter Scott represents Harold the Dauntless as a pillager of one of the brotherhood:

> Then heeding full little of ban or of curse,
> He has seized the Prior of Jorvaux's purse.

The exquisite chapter-house retains its corbels with colours on them. The kitchen exhibits three enormous fireplaces 9 feet wide. The chapter-house had a central arcade with six hexagonal pillars of grey marble. The last abbot, John de Sedburgh, was hanged at Tyburn for his share in the rising of the north.

I observe that a discussion is going on in the columns of the *Times* as to the relative advantages of two sites for the intended enlargement of our Abbey. The refectory at Jorvaux is in exactly the same position in relation to the Abbey itself as the refectory is (or rather was) at Westminster, but the above particulars show that in the old times it was not thought desirable to build something insignificant (even for a refectory), which "we should not see at all until we were beneath its vaulting." I have no hesitation in saying that we shall be more likely to restore the outward appearance of the Abbey and the ancient plan of the monastery by building nobly rather than timidly, whatever site may eventually be fixed upon.

BENEDICTUS.





INK-PHOTO SPRAGUE & Co 4 & 5 EASTHARDING STREET FETTER

NEW TRAVELLERS' CLUB, PICCADILLY, W.

Messrs. T. & F VERITY, Architects.



INK-PHOTO. SPRAGUE & Co 4 & 5. EAST HARDING STREET. FETTER LANE, E.C.

CHURCH OF S. MARK, MILVERTON, LEAMINGTON.

GEORGE GILBERT SCOTT, M.A., Architect.

The Architect. July 31st 1891.



NK PHOTO SPRA[illegible] HARDING STREET

CHURCH OF S. MARK, MILVERTON, LEAMINGTON.

VIEW LOOKING EAST.

GEORGE GILBERT SCOTT, M.A., Architect.



NEW PREMISES FOR MESSR



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UNG & MARTEN, STRATFORD.

ILLUSTRATIONS.

NEW TRAVELLERS' CLUB.

THIS building, situated at the corner of Piccadilly and White Horse Street, is now being erected for the above club by Sir HENRY BROWNRIGG, Bart. The accommodation provided consists of morning, smoking and dining-rooms, cloak and service-rooms on the ground floor, reading, writing and card-rooms, private dining and billiard-rooms on the first floor. On the upper floors are the secretary's rooms and bedrooms for the convenience of members. In the two basements are the lavatories and retiring-rooms for the members and staff, kitchen, cellars, stores, offices and boiler-rooms, &c. The front is executed in Ham Hill stone, and the building is entirely of fireproof construction on Messrs. DENNETT & INGLE'S system; the warming and ventilation is being carried out by Mr. W. W. PHIPSON, and the sanitary work by Messrs. JOHN BOLDING & SON. The contractors are Messrs. A. BUSH & SONS. Messrs. T. & F. VERITY are the architects.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NOS. 392, 393.—CHURCH OF ST. MARK, MILVERTON. [G. G. SCOTT, M.A.]

MESSRS. YOUNG & MARTEN'S PREMISES, BROADWAY, STRATFORD, E.

THIS drawing represents the premises of Messrs. YOUNG & MARTEN, in the Broadway, Stratford, E., as recently altered and enlarged. There is now a handsome new central entrance, having a staircase with two branches leading up to the gasfittings and paper departments on the one side, and to the chimneypiece and stove departments on the other. In the rear extensive warehouses have been built, which are fitted with hydraulic lifts and trams, so that the heaviest goods can be easily brought into the show-rooms. Steam power is also provided for driving the lathes and forges as well as the dynamos for the electric light. The works have been carried out from the designs and under the superintendence of Mr. ARTHUR ASHBRIDGE, F.R.I.B.A.

WESTMINSTER ABBEY.

IN the report of the Commission on Westminster Abbey it was stated that Sir A. H. Layard, Sir F. Leighton and the Dean of Westminster differed from the other Commissioners. The subject has given rise to the following correspondence in the *Times*:—

Sir A. H. Layard writes:—It appears to me to be of some importance that the public should be informed of the nature of the objections of Sir Frederick Leighton, the Dean of Westminster and myself to the refectory site for the monumental or mortuary chapel proposed to be added to Westminster Abbey, as we had no opportunity of stating them in the final report of the Royal Commission, of which we were members. I venture, therefore, to ask you to allow them to appear in your columns. The grounds of our dissent from our colleagues, Mr. Plunket, Mr. Jennings and Mr. Waterhouse, are the following:—

1. The proposed addition to the Abbey should be, as far as possible, a part and continuation of the Abbey itself, and should be capable of acquiring, in the future, a similar prestige and sanctity. These conditions would not, in our opinion, be fulfilled by the erection of the chapel on the refectory site, which is separated from the Abbey by the cloisters—a much-frequented public thoroughfare. On this objection the Archbishop of Canterbury, in his weighty evidence, laid great stress. As the Dean of Westminster stated to the Commission that the remains of the refectory afforded almost the only spot available for an office for the clerk of the works and for storing fragments of the old masonry (often very valuable), timber, lead and other materials, a chapel erected on the site would run a grave risk of becoming a lumber-room, especially as the cloisters are open to the general public, and the chapel would consequently have to be usually closed. The refectory site, from the very different associations which its name and ancient use—that of the monks' dining-room—suggest, would increase the difficulty of investing any new building raised on it with the associations and sacredness of the Abbey itself.

2. It is proposed, if the refectory site be adopted, to retain as the northern, and part of the eastern, wall of the chapel the existing wall, part of which dates from the period of Edward the Confessor, and the remainder from that of Edward IV. The rest of the building would be entirely new, and there would thus be an extraordinary and by no means pleasing contrast between the two portions of the interior. The old wall would not be available for monuments unless largely restored, or, indeed, partly reconstructed. Any such measure would provoke very keen opposition from all persons interested in the preservation of ancient buildings, and especially from influential archæologists.

3. That part of the refectory site now available would be inadequate for the erection of a monumental chapel worthy of the Abbey. It would be absolutely necessary to reacquire, even for the erection of a building of moderate size, the portion of it made over by Act of Parliament some years ago to the governing body of Westminster School, who, we are informed, would strenuously oppose any such retransfer. Moreover, a building erected on this site would seriously interfere with the lights of Ashburnham House, their property. Even with the addition of the alienated portion, a chapel worthy of the object intended, and of a size sufficient for the reception of monuments for any long period of time, could not be erected upon the refectory site, and the question of want of space would again arise. The proposed structure would only be about 130 feet in length by 37 feet in breadth, and it is very doubtful whether any means could be found for enlarging it. The north side of it, as already stated, would not be available for monuments if the ancient character of the wall forming it is to be preserved, and the opposite side would be encumbered by architectural details—as shown in Mr. Pearson's design (No. 12) annexed to the first report of the Royal Commission.

4. The plea urged in favour of a chapel on the refectory site—that it would "be hardly, if at all, visible from the outside"—appeared to us to be rather a blemish and disqualification in regard to a structure which, to have any significance, must, to future generations, share in the dignity of the great Abbey itself.

For these and other reasons we believe that interment in a chapel on the refectory site could never come to be considered as "burial in Westminster Abbey," and this, in our opinion, is an objection fatal to the scheme. On the other hand, on the site at the east end of the Abbey, which was preferred by Sir Frederick Leighton, the Dean of Westminster and myself, an edifice might be raised which would be in direct communication with the Abbey and would actually be part of it as its east end entrance—an edifice which would admit of further extension and could be erected in sections, and which might form, with the Abbey itself and the chapter-house, an imposing and beautiful group of buildings. It is to be regretted that the important evidence given on this subject by Mr. Pearson at the last meeting of the Commission was not added to its report. That eminent architect submitted to the Commission a very elaborate and most carefully-prepared design for this proposed addition to the Abbey, which enables us to state with some confidence—without, however, committing ourselves to any opinion as to its architectural features and details—that a structure which by its dignity and stateliness would perpetuate the solemn traditions attaching to the Abbey itself might be erected on this site, and that interment in it would be considered "burial in Westminster Abbey."

In conclusion, I may advert to an excellent suggestion made by the Dean of Westminster with the object of preserving the ancient wall of the refectory, that it might form part of a modest structure to serve as an office for the clerk of the works, and as a kind of museum to preserve relics of great interest and importance in their bearing upon the Abbey which are constantly accumulating.

Mr. Waterhouse writes:—Sir Henry Layard has stated in his letter to the *Times* of the 16th inst. the reasons which induced him, Sir F. Leighton, and the Dean of Westminster to dissent from the final recommendation of the report, that the proposed mortuary chapel should occupy the site of the old refectory of the monastery. Would you allow me a short space to explain some of the reasons which prevented me, as a member of the Commission, from joining these distinguished authorities in their dissent?

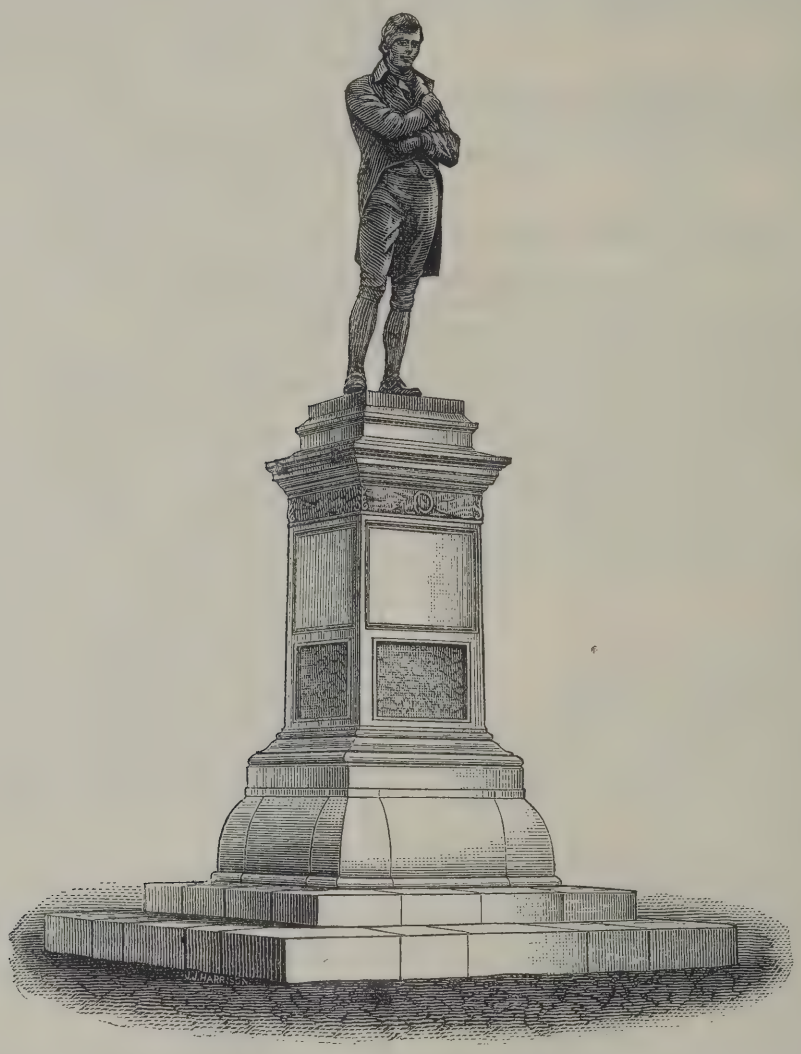
In the first place, though Mr. Pearson, the architect to the Chapter, produced at the close of the meeting of the Commission a very meritorious design for the proposed building on the site south of Henry VII.'s Chapel, it could only be approached from the Abbey by a cloister threading its way, necessarily somewhat awkwardly, through the arches formed by the flying buttresses of the chapter-house, and thus shutting out for ever from view the lower portions of that most beautiful feature of the Abbey group, just where the condemnation, and, as we hope, speedy removal, of the houses which now screen it from Old Palace Yard would restore to public appreciation a piece of splendid architecture, which has for so many generations been too much concealed.

In the second place, and on the other hand, the way to the refectory site from the Abbey is already made. It is one of the most noble and most beautiful that can be conceived—a way hallowed by association with the past—the west walk of the

cloisters. It has been urged against traversing the cloisters to gain the chapel that tradesmen take that way to the residences of the clergy east of the cloisters. This, it appears to me, could be prevented by requiring tradesmen to take another route. But the argument further loses force when we remember that it is the south walk they frequent, and not the west, which appears to lead only to the nave of the Abbey, and which is the entrance actually and at present for all funerals but royal ones.

Mr. Pearson's design, alluded to by Sir H. Layard, for covering the refectory site with a chapel was, again, one of great excellence. It covered an area nearly, if not quite, as large as the unobstructed portion of the nave of the Abbey, and of about the same proportions, and would surely supply the nation's needs for centuries, with the care now exercised to allow none but the greatest finding sepulture or monumental fame within the Abbey precincts. It is true that monks once dined on the refectory site; so have people dined, and, possibly in times long passed, even done worse than dine, in the houses which now occupy the south-east site. I do not think, therefore, that in point of association one site has much advantage over the other. On the refectory site we should have a beautiful structure which would not alter the present outward appearance of the Abbey nor the ancient plan of the monastery in the slightest, which we should not see at all (except perhaps its roof over the cloisters) until we were beneath its vaulting, and which would have a pathway of quite ideal excellence connecting it directly with the Abbey itself. On the south-east site we should have, if Mr. Pearson's design for that site was adopted, and when it was fully developed, a building we might well be proud of, but which would add a new feature to the interior of the Abbey, would be a serious competitor with Henry VII.'s Chapel itself, and be approached by a cloister from the necessities of the case somewhat unworthy of it—a cloister, moreover, which would confuse itself with, and hide the lower portions of, the noble chapter-house. Both schemes, it seems to me, have their merits, or the Commissioners would probably have been able to come to a unanimous recommendation. It is to be hoped that this want of unanimity will not prevent one or other of them being speedily adopted.

Mr. C. L. Eastlake writes:—A distinguished architect and member of the Commission on Westminster Abbey has lately given you his reasons for advocating the erection of a chapel, destined to receive monuments, on the site of the old refectory. Assuming the right of building there at all to have been acquired, I hope your correspondent will forgive me for reminding him of the old maxim, "Ædificare in tuo proprio solo non licet quod alteri noceat." Apart from the question of space available (and I doubt very much whether the area indicated would be sufficient, or nearly sufficient, for its purpose), there is another practical difficulty in the way, viz. Ashburnham House. At present the refectory site is really included in what once was, and still ought to be, a garden at the rear of this fine old mansion—a specimen of seventeenth-century architecture well known and dear to antiquaries, illustrated by Soane and Gwilt, lauded by Britton and Pugin, and possessing a staircase of such exceptional beauty that its design has been ascribed, not unreasonably, to Inigo Jones. This building is now the property of Westminster School, and, as the Head Master recently explained, has been turned to excellent account, without any material alteration of its features, by an appropriation of its several apartments to the purposes of a library and reading-room for the boys, classrooms, masters' common room, &c., all greatly needed, as I well remember, for when I was an *alumnus* at Westminster such accommodation did not exist. Now, if the refectory site be devoted to the erection of a chapel, the present open area which contributes so much to the light and ventilation of Ashburnham House will disappear. Its rear windows will be darkened by the proposed new structure, and many of its rooms must in consequence be rendered useless. Indeed, I fear the next step would be a proposal to demolish Ashburnham House itself. Is it necessary or desirable to encounter such a risk? I do not presume, sir, to offer an opinion respecting the alternative schemes submitted to the Commission, but one of them at least, as Sir Henry Layard, in his able letter to the *Times* of the 16th inst., pointed out, would meet every requirement, without involving the disfigurement and possibly the destruction of an old and highly-interesting building.



BURNS'S STATUE AT AYR.

THE above engraving shows the statue of Burns as unveiled at Ayr on the 8th inst. The statue is heroic in scale, standing 9 feet 1½ inches high, and is from the studio of Mr. George A. Lawson, H.R.S.A., of London. The pedestal is from the designs of Messrs. James A. Morris & Hunter, architects, of Ayr, and is executed in selected Kemnay granite by

Mr. Arthur Taylor, of Aberdeen. It is about 12 feet 3 inches high and has a 12 feet spread of base. The statue is regarded as the most successful of Burns yet produced, and being erected in his native town is of the greatest public interest.

PERSIAN CARPET WEAVING.*

CARPETS are manufactured in many parts of Persia; Isfahan, Shiraz and Kerman have all a certain fame for carpets; and, similarly, Kermanshah, Yezd, Kashan and Shuster are known for their cotton khelims. The most important manufacture of carpets, however, is in North-West Persia, in sundry provinces, with Sultanabad in Irak as the principal centre. Sultanabad is a comparatively new town, having been built, perhaps, sixty to eighty years ago. In the numerous villages by which it is surrounded, carpet weaving has been the great branch of industry for generations past, although in late years considerable improvements have been made in the class of work produced.

Of the valuable ancient carpets relatively few are found nowadays; like curios, the country is pretty well exhausted of them. Persia has been visited by so many European travellers in recent years that its formerly hidden treasures in the shape of curiosities, &c., have been hunted up out of their corners and have found their way to European museums or private collections.

It may seem almost incredible to many people that among the ancient carpets, whose manufacture dates back for such a considerable number of years, there are so many to be found that are still in good condition and comparatively little worn. The secret of this is that not only has great care been bestowed on the weaving of the carpets and on the quality of wool used, but because of the custom prevailing in the houses of Eastern people. Whilst we, with our more civilised ideas, enter our own and other people's rooms with the same boots with which we walk through the muddy streets, a Persian never enters any room, either his own or his neighbour's, without leaving his boots or shoes at the door. The Persian carpets of modern times are now so well known in Europe that a more detailed description as to the way in which they are manufactured may prove interesting.

The weaving is done exclusively by women of all ages. The only share the men take in the work is, that to them the merchants give out the designs (*wagirehs*), the colours, and money required for the weaving. The men also see to the purchase of the wool, &c., and afterwards deliver the carpets to the merchants, getting all the blame for mistakes made in the weaving by their respective wives and daughters. A loom itself is a very inexpensive and simple structure, consisting of four wooden poles, which generally occupy the whole length of the weaving-room. The first thing a weaver has to do when he starts weaving is to buy the necessary material for mounting his carpet and for the warp, the mounting being also a duty allotted to the men. Then he buys his wool and sends it to the dyer, to have it dyed according to the samples given out to him by the merchant. It must not be thought, however, that a weaver, as soon as he has obtained an order for a carpet, hurries home to his village to start it the next morning. There certainly are quick weavers, but they are few and far between. A great many, as soon as they have received the cash advanced to them, spend a greater or smaller part of it on themselves. They buy themselves clothing, pay off debts, gamble, or invest in land, gardens, grain, &c. By the time the carpet ought to be ready the weaver frequently only begins to think of starting it. His speculations often turn out badly, and he finds himself consequently unable to finish the carpet contracted for with the money he has left. However, he buys a little wool to start with, and has it dyed, a quantity sufficient perhaps for one-third of the carpet he has to weave. When this is finished, his resources are probably exhausted, and he is therefore obliged to look out for other means to complete the carpet. His next move is to try and obtain an order for a second carpet from another merchant—of course solemnly declaring that he has no contract for a carpet for anybody else, and promising to deliver it within the stipulated time. He is always, according to his own words, the very best and quickest weaver of his village, and has plenty of reasons to show for happening to be without work just then. Most frequently his excuse for having left his former master is that, owing to a serious (but generally imaginary) illness of his wife, his last carpet was one month overdue, for which interest had been deducted, and he therefore does not wish to serve that master any more. His village being perhaps twenty to thirty miles away, the truth of such statements cannot be determined at once.

Instead of applying to a second master, he also frequently goes to the one for whom he is weaving, and tells him that his carpet is almost finished, that it will be delivered during the next week, &c., but that, as he wants some money for himself, he would be glad of a small advance on account of his next contract. Supplied with fresh money, he then finishes the original carpet. First, however, he must buy the remainder of the wool required and send it to the dyer. The latter is in most cases quite as careless as the weaver, and never dyes the same shade of colour twice, the hue being either darker or lighter. The result is that the wool with which the first part of the carpet is woven is of a different shade from the second part, but this can no more be helped, and the carpet is delivered as it turns out, viz. spoiled. This, however, is not the only consequence of the weaver's private speculations. He has to make up for his loss somehow or other, and accordingly buys an inferior kind of wool than that contracted for, gets other and cheaper colours dyed than his samples, and employs less experienced weavers, so as to save something in wages. With his next carpet he deals very much in the same way, and the only means of punishing him is to dismiss him, and to make him pay for the difference in value between the carpet delivered and that contracted for. If he does the latter he has of course to cheat somebody else first.

Even if we take the case of a good weaver his work seldom progresses without incessant interruptions. Often the dyer disappoints him by keeping him waiting for his wool, but more frequently his own household affairs put a temporary stop to weaving. His wife has to attend to her baby, milk the cows, make butter, see to the sheep, &c., all of which cause constant delays in the progress of the work.

When weaving is going on regularly, three or four women at a carpet of fairly large size, the weaver's wife being, as a rule, the principal weaver, and at the same time superintending the work of her daughters or hired women, the rule is that at each end of the board on which the women are seated there should be one female overseer. For carpets of very large size, in the weaving of which seven or eight women are employed, there is also one overseer in the middle. At the age of seven years girls begin already to assist in the weaving; previous to that age they spend a year or so on the board, watching the other women, so that at an early age they may be accustomed to the work. If a young woman who has been brought up to the loom gets married, the first thing she does is to try and obtain an order for a carpet, so that the weaving of carpets passes down from one generation to another.

People in Europe who buy Persian carpets little think of the enormous labour that has been expended on the weaving. It is done exclusively by hand, and every stitch in the carpet is made separately, being afterwards clipped with the scissors and beaten down. Some idea of the work may be formed when it is known that in a good carpet there are about 10,000 stitches to every square foot.

The clipping and beating down are also very essential points in the work. The clipping, for instance, must be done every time with equal care, otherwise, when the carpet is finished, the pile will be short in some places and longer in others. Upon the beating down depends the closeness of the texture; the more a weaver beats her stitches down the finer, of course, the carpet is. She knows how many stitches she has to weave to every quarter of a Persian yard, but she generally makes less, so as to save wool, time and trouble. There are carpets, like the cheap Heratis, which have no more than 50 stitches, and 75 stitches, at the highest, to every quarter Persian *zar*. Good quality carpets have 85 to 95 stitches, and finely-woven rugs have frequently over 200 stitches. At the latter rate there would be fully 40,000 stitches to a square foot.

In summer time, when the days are long, the work goes on fairly fast; but in winter it progresses very slowly. When the cold is not too intense, the women have a pot with fire between them when weaving, over which they warm their fingers from time to time, but on very cold days they suspend work altogether.

The width of a carpet depends upon the size of the loom, but the length can be made of any dimension. When the weaving has all but reached to the top of the loom, the carpet has to be taken down and rolled up at the bottom, and the work is then started again upwards. The rolled up (finished) part is sewn to the bottom part of the loom, and if this is not done very carefully the remaining portion of the carpet is sure to "go out"—in other words, the carpet turns out crooked.

There are several European firms engaged in the trade, whose headquarters are in Manchester and London. Besides these European houses, a great number of Persian and Turkish merchants export carpets. When the trade was exclusively in the hands of native merchants, no other carpets were woven than the ordinary Herati and Shah-Abbas kinds. By introducing new designs, great improvements have been made in this direction by the European firms. These designs, which have been made at great expense and have cost much labour, are their individual property. Weavers have now grown pretty well accustomed to weaving these new designs, but they frequently

* From a report by M. G. de Vries in the *Journal of the Society of Arts*.

spoil the effect of them by leaving out part of the original design, and placing something of their own invention in its stead. Even nowadays, nearly all the carpets exported by Persians and Turks are Heratis and Shah-Abbas patterns, with a few very simple designs among them. They do not understand the art of designing something novel, but are very clever in the art of pirating the designs belonging to the European firms. Formerly there did not exist any law against this pirating of designs, but as in recent years this evil grew worse and worse, the Persian Government, through the influence of the British Legation at Teheran, have at last, at the commencement of this year, acknowledged the right of property of designs, and the copying of them is now strictly prohibited.

In addition to designs, the shades of colours employed in the carpets are a matter of vital importance, requiring the most careful attention, since they must be in harmony with the ever-changing taste of European markets. At present entirely new colours are the rage, which give a carpet more the appearance of an antique than of a new one; but it is certain that the taste for these fancy colours is only a passing one, and the sooner people return to the former colours the better. Aniline is still greatly used in the dyes by the native merchants, but carpets woven of such colours should be entirely avoided, as the colours fade away after a time. Besides woollen carpets, rugs are exported woven entirely of silk. The weaving of such rugs is done in the same way as the weaving of carpets, but the labour is far greater in proportion, as they are always of a very fine make. Such rugs can be used as table and sofa-covers, portières, &c., but as they are made of pure silk they are very costly.

Altogether, it will be seen from the foregoing that the Persian carpet business is far from being a bed of roses. From all points of view the trade is a most difficult one, and long experience and a thorough acquaintance with the weavers and their ways are necessary to surmount some of the numerous obstacles.

The districts where carpets are woven are Ferahan, Muscabad, Japelag, Kezaz, Cherreh and Saraband, comprising in all about 150 villages, with a total number of looms estimated at about 5,000. The quality of carpets which these looms produce varies according to the districts. Most of the above districts produce only second and third quality work. In two of the largest, however, a fair proportion of the looms produce first quality carpets.

In some of the looms as many as five to six hands are employed, but this is rather an exception. The average is three weavers to a loom of fairly large size, one or two weavers for small looms; so that, if all looms are engaged, close upon 1,000 hands would be employed. A fast and steady weaver could deliver annually three to four carpets of ordinary size; but a large number only weave at intervals, and slow weavers take sometimes eighteen months to two years to finish one carpet. The irregular weaving makes it, therefore, impossible to give anything like a reliable estimate of the annual output or export value.

ANCIENT LINCOLN.

A SPECIAL meeting of the Lincoln Town Council was lately held in the Guildhall, for the purpose of presenting a congratulatory address to the high sheriff of the county, Mr. Jos. Ruston, J.P., and also for the purpose of conferring upon him the honorary freedom of the city. In acknowledging the honour conferred on him, Mr. Ruston alluded to the antiquity of Lincoln. Lincoln, he said, is not what we may call a mushroom borough. We know there are cities and large towns in Great Britain now with half a million people, about which one can only use an expression of that kind when we want to compare those places with the antiquity of this city of Lincoln, and I feel, when we look upon the records of this city in connection with its antiquity, I have every reason to be proud of it, and these words are to me immensely enhanced, and this gift is immensely enhanced by the remembrance of those things. Many hundreds of years ago—more than a thousand years ago—this city was spoken of as a splendid city, with more than a thousand mansions in it, and everywhere we see around us the ruins of noble buildings, and we know that beneath our feet there lie the remains of other noble buildings and noble work, all of which speak to us of the greatness of the men who lived in those days. I need only refer you for one moment to those columns which were discovered by Mr. Allis, in Bailgate, about twelve years ago—two or three columns which indicated there was an important Roman structure there. That discovery was increased by another discovery upon adjoining property, when the line of these columns was more than doubled, and now within the last four months another discovery on the very same site was made by the workmen of your municipality in connection, I believe, with your waterworks, when they laid bare a line of columns, showing that there must have been a building as long as the nave of Lincoln Cathedral. When we reflect that that building went back to a period of 1,400 or 1,800 years ago, I am sure we have something to be proud of when we remember the men who lived in this city so long ago. Why, we sent members to Parliament more than 600 years ago, and I believe the first Mayor that filled that chair, although it was not in this building, was elected in 1384, so that the freedom of this city, which you have been gracious and kind enough to present to me to-day a a mark of your esteem, is not that of a borough or city which has been created within the last hundred years, but it comes from a city which is one of the oldest—one of the two or three oldest—in Great Britain. When I think of these things I am proud to belong to this city of Lincoln. I find it is full of great and noble traditions on account of these great men of old who have preceded us. They have in their works left their mark for us to study and to guide us. I have spoken of that Roman forum or basilica, or villa, whatever it was, and we know during the last hundred years we find treasured in this place or that place different specimens of art-work or useful work in stone which was carried out by those ancestors of ours so many hundreds, almost thousands, of years ago; and then, again, look at the more modern work, the cathedral upon the hill of this city. I like to ask myself—who was the designer of that building, and who were the artificers who carried out the work? Then look at this county as a whole. It has reared great men in statesmanship, in science, art and literature. We have had men who have become eminent in adventures, in travel, in discoveries, in agriculture and in commerce, and whence have come all these modern men, comparatively modern men as compared with the antiquity of Roman times? I speak of such men as Isaac Newton and Lord Burghley and others of three centuries past. I speak of them as modern men, and I delight to find some reason for their existence in connection with the great ancestors who preceded them. I like to feel that I may get some reasonable account of the fact that this county has raised such great men, and that in that respect the mantle of these ancestors has fallen upon the shoulders of their successors; and I believe as we cherish these traditions they will inspire higher ideals and nobler aims in life—the memory of our fathers is enshrined in the works which they have left us, and which we see around us.

TESSERÆ.

Effects of Shadow on Colours.

IT is not surprising that the effect of shadow upon colours should be generally unobserved. When recognised at all, it is commonly supposed simply to darken colour; but this is a loose notion—it really expunges colour. The proper colour of an illuminated object disappears where shadow comes upon it, and not only so, but another appears in its stead, the opposite of that displaced. If the illuminated colour is warm the shadow will be cool, varying from gray to positive blue or purple, and even crimson, which is on the cold side compared with orange and rich green. If the illuminated surface is cool, as in moonlight, the shadows will be warm and brown. Shadows among colours introduce a delicious tenderness and variety of neutral tones, but other influences combine for this, the most potent of which are the reflections which invade shadows. These carry with them the tints of the surface from which they come; hence the blueness of many shadows which receive the reflected light of the sky, and the warmth of a shadowed wall against which the ground tints strike. But other than shadowed spaces are thus affected. Observe the sea receiving on its bosom all the hues of the sky, or the still lake returning those of its shores, or the pool enriched with the colours of its shelving banks and overhanging trees. Such reflections are exquisite in their translucent play. But all things in the glow of daylight return each other's colours wherever their relative positions admit of it, so that colour is broken and spread by this means over almost the entire surface of nature, and by reason of its dim and fitful character, bordering upon mystery, possesses a secret hold upon the imagination. Transparency imparts a peculiarly pure brilliance—not gay, but soft. All coarseness or dulness vanishes, and the colours are penetrated with a hidden radiance which delights the fancy. Leaves are enriched to emeralds, water emulates the trembling splendour of amethyst and topaz, clouds become mother-of-pearl. Yet art must be chary of these beauties, as nature is. Opacity has its satisfaction; the grainy solid masses, the dull and mingled glooms, feast the eye as with substantial wealth. But atmosphere is the most universal and effective agent in modifying colour. Atmosphere gradates colours, but it also changes them. The green near woods become a tender blue in the distance, neutral-tinted rocks a pale crimson, and the brown moorland or dark fir-wood a rich purple. These general facts are noticed by most of those whose rambles lead them into open country. But few observe how the green of a field fades as it recedes; a green field is to

the ordinary eye green all over. The artist notices the varying quality of the green, that when the atmosphere is suffused with sunlight the nearer green is a golden yellow, the distant almost blue.

Melrose Abbey.

The most beautiful of all the northern fanes of whatever time is Melrose. The splendour of Middle Age romance which Scott has thrown around the place has almost obliterated its older and holier renown, when it was described by Bede as the home of the meek Eata, the prophetic Boisil, the austere Cuthbert; when, with Coldingham and Abercorn and Tyningham, it was the lamp of that Anglo-Saxon Lothian which, deriving its own faith from Iona, sped the glad gift to many an English province, and even sent a missionary across the seas to become the apostle of the Austrasian tribes on the Meuse, the Waal and the Rhine. The light of Melrose had long been quenched, when in the middle of the twelfth century St. David bestowed the territory on a colony of white-robed Cistercians from Rievaulx. The site of the ancient shrine, on a lovely bank almost encircled by the Tweed, was still marked by a chapel, which bore the name of St. Cuthbert, and was the frequent resort of pilgrims. But the new monks chose their dwelling some little distance above, on the plain between the river and the skirts of "Eildon's triple height." They dug the foundations of their church in the spring of 1136, and it was consecrated before the summer of 1146 was at an end. This fabric was laid in ruins during the Wars of the Succession—the scourge of which fell so heavy on the border abbeys that the monks and novices of wealthy Kelso, though their house escaped destruction, were driven to beg food and clothing among the more fortunate monasteries remote from the English march. The rebuilding of Melrose, as we now see it, received the especial patronage of Bruce, and occupied almost his latest thoughts. In 1326 he made a grant to the monastery, for the fabric of its new church, of all the feudal casualties and crown issues of Teviotdale, until they should amount to two thousand pounds sterling—a sum equal to more than fifty thousand pounds in the present day. "The good Sir James of Douglas" was appointed steward and warden of the bequest; and the king, from his deathbed at Cardross on the Clyde, addressed a letter to his son and successor, entreating him in the tenderest terms, and by the most solemn adjurations, to see that the grant received liberal fulfilment, and that "all love, honour and privilege be rendered for evermore to the monastery of Melrose, which he himself had in such pious affection, that he had appointed his heart to be buried within its walls." This remarkable letter was written on May 11, and the king expired on June 7, 1329, so that it must have been suddenly and in the last stages of his loathsome malady that the innocent blood of Cumyn and the unfulfilled vow of penance rose before his soul, and he resolved that his dead heart should be borne by the Knight of Douglas on that pilgrimage to the Holy Land which his living feet had failed to accomplish. But the memorable death of the good Sir James frustrated the king's dying wish; and the heart, brought back from the Andalusian battlefield, was by Randolph entombed at Melrose "with great worship." The new building seems for a time to have proceeded slowly. The grant of King Robert was renewed by David II. in 1370, in terms which show that no considerable portion of the two thousand pounds had then been received; and, indeed, it appears that the full amount of the bequest had not been completed even in 1399. Great part of the edifice, however, must have been built before that time, by the help doubtless of the opulent revenues which the abbey enjoyed from other sources. The character of its architecture—graceful symmetry, lavish profusion of ornament, exquisite delicacy of workmanship—has been familiar to every one since the publication of the "Lay of the Last Minstrel," which presents the structure in lines so admirably true that they have passed as definitions into the handbooks of the ecclesiologists. It is less generally remembered that during most part of the century in which this glory of Scottish art was built, Teviotdale was an English county, and the monks of Melrose were liegemen of the English king.

Development of Basilicas.

The first growth made in basilican building was the transept, which pushed back the apse. To one side, that of the entrance, was attached a square cortile, with open colonnades round, and sometimes a fountain in the centre. In the larger basilicas this seems to have been general, but few of them have survived the changes of so many centuries. This roomy court surrounded by dead walls was familiar, from the accustomed arrangements of the Roman dwelling-houses of the more important class. It is still traceable in the mosque of Sta Sophia of Justinian at Constantinople, the churches of San Vitale at Ravenna, San Clemente at Rome, Sant' Ambrogio at Milan and other churches of the first nine centuries. It has disappeared from all the great basilicas at Rome, though we may take the double colonnades of modern St. Peter's as the representative of that of the ancient building. The Romans attached distinct baptisteries to their churches. These generally followed the type of the existing circular buildings from their obvious applicability. That of St. John Lateran, though altered, is still the same in main lines and parts that was built by Constantine, and in which he was said to have been baptized by Pope St. Sylvester. It is octagonal, and consists of an octagonal colonnade supporting a massive architrave, from which rises a second, supporting the octagonal roof. The lower colonnade is surrounded by a wide passage or aisle for spectators. The centre descends by steps into the font. The contemporary church of Sta Costanza was built for a similar purpose, and was used for the baptism of the imperial family, who were buried in the great porphyry sarcophagus formerly placed in it, but at present in the Vatican gallery. The form of this church is still more elegant. It consists of a circular colonnade of arches on coupled columns, surmounted by a vaulted dome and surrounded by a vaulted aisle. On the same model were built the round church of Nocera and the circular church near Bonn on the Rhine. These were either directly on the plan, or mere modifications of the circular aulæ of the baths, such as those of Diocletian, three of which still subsist. One forms the parish church of San Bernardo, and another, smaller, was incorporated by Vanvitelli into Michel Angelo's adapted church of Sta Maria degli Angeli, that of the Carthusian Fathers. These are well-constructed vaults of brick. The Pantheon, older than any of them, being so vast and massive that it was only the gigantic mind of Michel Angelo that has since conceived the idea of rearing such a mass into the heavens on piers and arches. Another circular church—that of San Stefano on the Cælian, said to be an ancient building—is larger than any of these, excepting the Pantheon, but less scientific. It is surrounded by an aisle, but the central part is traversed by walls on which an ordinary timber roof is supported. It was, however, too large and important to serve merely the purpose of a baptistery. Church architecture in Rome made little progress as to type and form beyond this point. Galleries, a marked feature in the basilicas of a more Byzantine character, are rare in Rome itself. Though a requisite in Constantinople for the use of women, they are not to be found in the early basilicas of Rome, or with few exceptions. That of St. Agnes is of the earliest age; but the fact of the church being built in the Catacombs, and, therefore, several feet below the surface of the ground, may have suggested it. The galleries surround the church on three sides, and are approached from the ground level. A very curious old church, called that of the Quattro Santi Incoronati, has also galleries on its two sides, ending abruptly at the altar end, so as to leave a regular basilican transept between nave and apse, the galleries and their colonnades performing the part of the walls, which usually divide the great basilicas and support their roofs. The church is, perhaps, the most direct representative of the actual basilican hall of the old empire, as to its galleries, in existence.

Devonshire Churches.

A certain deficiency in rich and elaborate ornament, which, as compared with those of other counties, may be observed more or less throughout the churches of Devonshire, is probably owing to the nature of the materials with which the local builders were compelled to work. On the borders of Dartmoor, and indeed wherever it was possible, granite has been used; grand and effective in its heavy masses and simple mouldings, but incapable of being chiselled into the buds and bells, the palm branches and the fern leaves wreathed about the arches and capitals of churches in the sandstone and oolite districts. The ferruginous trap, which is the principal stone in the neighbourhood of Exeter and in great part of North Devon, is scarcely softer than the granite; and although Caen stone was largely imported, and is the chief material used for the cathedral, it found in Devonshire a serious rival in a reddish porphyritic "elvan," known as the Roborough stone (to the old fortress of which hundred it probably gave name, Ro-burh [A. S.], the red castle), which is still quarried in the neighbourhood of Plymouth. None of these materials lent themselves to elaborate carving; and the very rich stone pulpits which remain in some few churches are worked in Caen stone. But, as if by way of compensation for this deficiency, the woodwork, which is still to be admired in the churches of Devonshire, in spite of the terrible havoc to which it has been exposed, even within the last century, probably exceeds in beauty and intricacy of detail that of any other English province. How the native artists luxuriated in twining vine branches, and in all the graceful maze of forest boughs and flowers, we may see in the beautiful screens of Cullompton, of Dartmouth, of Harberton, of Atherington, and of numberless other churches scattered over the county. All were elaborately coloured; and, especially in those churches which belonged to the large monasteries, the lower panels were filled with painted figures of saints, many of which remain, of no ordinary execution, and effective in spite of grotesque accompaniments. In one other point the churches of Devonshire surpass those of most other counties—beauty of situation. Sometimes located close to the old manor-house,

and sheltered by the same ancestral woods; sometimes on high ground, and looking across a wide landscape of coppice and orchard and meadow, to the distant ridges of Dartmoor; and sometimes rising in the midst of the long green coomb, over which the lichen-tinted tower flings the shadow of its own antiquity—it is scarcely possible to determine to which position the "insita species venustatis," such as Bede admired on the hill of St. Alban's martyrdom, belongs most completely. There is something, too, which finely harmonises with the surrounding scene in the influences, visible on the buildings themselves, of the soft mists and warm breezes of the west; and the most thorough-paced ecclesiologist would hardly look with an evil eye on the golden mosses and the hart's-tongue that light up the grey walls with touches of the loveliest colour. Whether he would feel equal sympathy with our own liking for many details in the interior fittings of remote Devonshire churches is perhaps more doubtful. Devonshire has by no means been behindhand in zeal for church building and church restoration; and such results as have been obtained at Cullompton, at Tiverton, at Ottery, at Yealmpton, and in many other places may be pointed out with no small pride and admiration. True restoration, however, demands not only the delicate hand of an artist, but still more, a delicate feeling for local character and sentiment. All situations will not bear the same treatment; and there is many a village church, nestled under the tors of Dartmoor, which, with its worn benches, its dimmed window quarrels, its admonitory texts, and its rough granite pavement, is to us far more impressive in its ancient simplicity than the most elaborate display of carved work and of colour could possibly render it. Such churches retain the old-world character of the district.

A. W. Pugin's Stage Craft.

So completely did the mania for theatrical representations enthral Pugin that he was for ever making experiments in order to produce startling and novel mechanical changes, and he made himself acquainted with all that had been written and published on the subject; but little was to be obtained either from the designs of Peruzzi or any more modern artist. The only man in comparatively recent times who devoted attention to the subject was Inigo Jones, who displayed great fancy and talent, not merely as a scene-painter, but in producing pageants and masques, and planning the decorations and machinery for them. Perhaps Pugin may claim to have done as much in his way for producing correct representations of the pageants of the Middle Ages. With a view to help him in this pursuit his parents allowed him to convert the upper floor of their house in Great Russell Street into a model theatre. This he did at much expense, removing the attic ceiling, cutting away the roof, constructing cisterns, and adapting everything necessary to his object. On this model stage he designed the most exquisite scenery, with fountains, tricks, traps, drop-scenes, wings, soffites, hilly scenes, flats, open flats and every magic change of which stage mechanism is capable. Large parties were invited to witness his performances, and probably a more skilfully made model theatre has never been seen. It was not a toy in any sense of the word, but a piece of construction sufficiently large to enable Pugin to exhibit experiments and study compositions before they were adopted on the actual stage. The intricacy of the mechanism was surprising, but every part was so admirably adjusted that the changes in the scenes, wings and sky-pieces were effected with marvellous rapidity, for it was provided with lines, pulleys, grooves, balance weights, machines for ascents and descents, &c.

The National Gallery.

It was not until the year 1824 that the National Gallery was founded in England. On the death about that time of an eminent connoisseur, Mr. Angerstein, it was suggested that the valuable pictures he had collected should be purchased for the nation. Parliament was induced to grant 57,000*l.* for this purpose, and an additional sum of 3,000*l.* for the expenses of exhibition and preservation. The number of paintings thus acquired was not large, but it included several of the highest merit—such as *The Raising of Lazarus*, by Sebastian del Piombo, four fine Claudes, and Rembrandt's *Woman taken in Adultery*; together with nine admirable specimens of the English school, comprising the portrait of *Lord Heathfield*, by Sir Joshua Reynolds; his own portrait, and the *Marriage à la Mode*, by Hogarth; and Wilkie's *Village Festival*. During the following ten years only four pictures were added by purchase, amongst them, however, the excellent *Bacchus and Ariadne*, of Titian; but thirty were presented to the nation, sixteen having been bequeathed by Sir G. Beaumont to the trustees of the British Museum, who deposited them in the National Gallery. Within the next ten years fifteen were bought, comprising several very important works, such as Correggio's *Mercury instructing Cupid*, Raphael's *St. Catherine*, and the great altar-piece in two divisions, by Francia. During the same period one hundred were presented and bequeathed, including the collections of the Rev. W. H. Carr, Colonel Ollney and Lord Farnborough, the greater part being pictures by the old masters. A National Gallery having thus been founded, the duty devolved upon the Government of providing for its proper administration. On the purchase of the Angerstein collection the Board of Treasury, to which by a strange inconsistency the artistic education of the country had been confided, appointed for the purpose a "keeper," whose duty it was to take charge of the pictures, to negotiate for such as might be selected for purchase, and to regulate the admission of students and the public to the Gallery. A committee of six gentlemen was named to undertake the general superintendence. Subsequently this committee was changed into a trust; the number of trustees was increased to seventeen; and the First Lord of the Treasury and the Chancellor of the Exchequer became *ex officio* members of the Board. But a question no less important than the improved system of management had previously presented itself. Where was the national collection to be exhibited? It had rapidly outgrown the space originally allotted to it, and required a building expressly constructed for its reception. It was at length determined to raise a suitable edifice, and Government chose for this purpose "the finest site in Europe," which had been recently cleared to Charing Cross. In 1832 Mr. W. Wilkins, the architect selected, commenced his work; six years after it was opened to the public. The collection of ancient masters comprised 110 pictures, about the number the rooms allotted to them could conveniently hold, if paintings were hung to be seen, and not as mere furniture to cover the nakedness of the walls.

GENERAL.

A Bust of Thomas Carlyle was unveiled on Saturday in the Valhalla of the Wallace Memorial, Stirling. It is a replica of one in the Corporation Galleries, Glasgow, by Mr. Macgillivray.

An Exhibition of Russian art and industry is to be held next year in the great hall and galleries of the Champ de Mars, Paris.

The Arts Committee of the Liverpool Corporation propose making an application to the Department of Science and Art of the Committee of Council on Education, for a grant in aid of the purchase of casts, including portions of the frieze of the Parthenon, and a selection of casts illustrating the Italian Renaissance.

An Altar Recess, containing some rude frescoes, probably of the fifteenth century, has been brought to light during alterations in progress in the Minster at Wimborne.

The Birmingham City Council have approved of the report from the Museum and School of Art Committee asking for authority to extend the Municipal School of Art, at a cost of 15,000*l.*, upon the land in Cornwall Street already acquired for the purpose.

The Family of the late Mr. Stephen Chesters, of Manchester, have undertaken to defray the cost of the restoration of the south-west bay of the Manchester Cathedral. Estimates for the work are to be prepared.

The Marquis of Ripon, as president, has invited the members of the British Archæological Association to visit Studley Royal and Fountains Abbey during the annual congress, which opens at York on August 17.

The Archæological Section of the Birmingham Midland Institute made an excursion to Kingswood on Saturday, under the guidance of Mr. J. A. Cossins.

The Edinburgh Town Council have agreed to recommend the Corporation to confer the freedom of the city on Sir Daniel Wilson, president of the Toronto University, and author of the work on "Old Edinburgh," who is now on a visit to Scotland.

Mr. Charles Ferguson, architect, Carlisle, has been commissioned to prepare plans for a vicarage house for Holy Trinity Church, Carlisle, which it is proposed to build next spring.

The Wrexham Town Council has decided to build a new school of art adjoining the Guildhall.

The Surrey Convalescent Home, Seaford, was opened by H.R.H. the Duke of Cambridge on Monday. It was erected by an anonymous philanthropist, from Mr. Christian's designs, at a cost of 15,000*l.*

The Committee for the proposed public library at Southampton call the attention of competitors specially to the following alteration in the plan of site:—On the west side of the site set forth in the plan a building line is shown, set back 5 feet from Bedford Road, and having reference to a frontage to that road of 128 feet. This dotted building line is incorrect, and should be disregarded. The correct building line on the west side of the site is the street line of Bedford Road, as shown coloured red on the plan.

The Architect.

THE WEEK.

On Saturday, the 15th inst., the Society of Architects will set out on an excursion to Belgium, and there must be few who will not join in the desire that the journey will be satisfactory throughout. The members are to have an audience with the King of the Belgians soon after their arrival at Ostend—that is, of course, if the condition of the Queen will allow His Majesty to be absent from Brussels. Sunday and Monday will be spent in Bruges, Tuesday in Ghent, Wednesday in Antwerp, Thursday in Malines, Friday in Louvain, Saturday and next day in Brussels. In the second week Mons, Tournai, Courtrai, Oudenarde and Ypres will be visited by all who can remain for that time. The route has been well chosen, and even those who are familiar with the Flemish towns will find pleasure in re-visiting them. The charges are most moderate.

The following is the result of the competition for the artisans' dwellings in Manchester, which are to be erected by the City Council:—*Oldham Road Area*—First premium, 100*l.*, Messrs. Spalding & Cross, Queen Street, Cheapside, London ("Practical"); second premium, 50*l.*, Mr. W. R. Sharp, 13 Exchange Arcade, Manchester ("Simplex"); third premium, 25*l.*, Messrs. Gibson & Russell, Old Bond Street, London ("All Things Considered"). *Pollard Street Area*—First premium, 30*l.*, Messrs. Spalding & Cross; second premium, 20*l.*, Mr. T. L. Worthington, Queen Anne's Gate, London.

On Friday last appeals were heard by the new tribunal against some lines of frontage laid down by the superintending architect of the London County Council, the arbitrators being Messrs. Cates (chairman), Driver and Hutton. In the case of Thomson *v.* London County Council, in which Mr. Bezley, instructed by Mr. Baron, raised an important point as to whether an owner is not entitled to erect buildings on any portion of his forecourt irrespective of the building line provided the house existed previous to the passing of the Metropolitan Building Act, 1855, unless the Vestry or Council should give notice to purchase such land. He quoted the case of Lord Auckland *v.* Westminster District Board of Works (*Law Times Reports*, August 31, 1872), when Justice Mellish ruled that "an owner's courtyard was as much a secret and private place as any other part of his property." Mr. W. T. Hollands, architect, produced plans and models, and proved the width of the Kennington Road, where the property in question is situate, at 79 feet. Mr. Smith defended his vestry, and Mr. Blashill his opinion as to the building line. The arbitrators reserved their decision for further consideration. The case in question, and, in fact, all these appeals are very important both to the owners of frontages on all old roads, as well as to Vestries *v.* London County Council.

When the bronze lion that long surmounted the column of the Piazzetta in Venice was replaced in its present position after the downfall of Napoleon, the Parisians consoled themselves for its removal from the esplanade of the Invalides by saying it was of no value as a work of art, and it certainly suffered by its journey to Paris. But about the antiquity of the work there could be no doubt. As yet inquiry has not determined the age or the origin of the lion. At the last meeting of the Académie des Inscriptions M. Casati endeavoured to prove that it must have been produced in ancient Etruria. He considers it has something in common with the chimera of the Florence Museum and the Leyden griffin. The two imaginative figures are inscribed with the word "Tinscvil" in Etruscan characters, of which various interpretations have been given, but M. Casati considers that it designated the God known as Jupiter or Zeus. A similar word is not to be found on the lion in Venice, but as many of the characteristics of the three works correspond, he concludes that if two of them are Etruscan the third must have had a similar origin. Besides, the Etruscans were the only people in Europe who seemed to be competent to produce so difficult a work. The theory of the Assyrian origin of the lion cannot be supported by any evidence.

An effort was made at the meeting of the Manchester Council on Wednesday to preserve the tower which has survived the demolition of St. Mary's Church, Deansgate. Mr. Waterhouse is an admirer of the tower, and is in favour of upholding it. But the Parks and Cemeteries Committee believe there is no architectural beauty in it, and that it could not be retained with advantage in the open space which was formed about it. There are, it appears, other reasons for the destruction which it is considered prudent not to divulge. Accordingly, it has been decided that the tower is to share the fate of the buildings of which it used to form a part.

The risk of trusting to agreements which are merely oral was exemplified in a case that was tried at the Liverpool Assizes on Wednesday. The plaintiff, Mr. Stirrup, architect, of Blackburn, sought to recover 149*l.* 5*s.* 10*d.* from a local brewing company for work done. He stated that in May 1889 he was commissioned to prepare elevations, plans and specifications for offices, &c., in connection with the brewery in Higher Eanam, Blackburn, and that in July and August 1890 he was again engaged to prepare plans, quantities, &c., for the erection of a new brewery at the same place. The claim was based on 5 per cent. on the lowest tender for the construction of the offices, and 1¼ per cent. on the lowest estimated cost for the erection of the brewery. The defence was that the company had not employed the plaintiff to do the work, and that he did it at his own risk. It was maintained that the designing was a speculative affair on the part of the plaintiff, and he was not to be paid for the work unless it was satisfactory to the defendants. The judge, who heard the case without a jury, found for the defendants with costs.

That artists in Scotland suffer many grievances through the shortcomings of the Royal Scottish Academy is beyond all question, and the defence which the Academicians recently offered for their conduct was the best testimony in favour of the cause of the reformers. A step has just been taken which is likely, however, to do more than any discussion towards convincing the Academicians that their rights are only of minor importance in all questions relating to the advancement of national art. We referred lately to the formation of a Society of Scottish Artists that purposed to be independent of the Academy. The members rightly considered they had some claim on the authorities for a place of exhibition. Application was accordingly made to the Board of Manufactures, that in Scotland has much authority over property which can be utilised for the teaching of art. The board at once agreed to place the eastern part of the Scottish National Gallery at the disposal of the Society of Artists, but stipulated that the exhibitions were not to be confined to the works of painters and sculptors, and that architects, decorators and designers should also have a right to display their works. There will, of course, be no difficulty in carrying out the arrangement, and in fact it is surprising that the Board of Manufactures should be left to make the proposal.

The patronage of the Conseil Municipal of Paris has been distributed this year among the rival exhibitions, but with a difference in amount. Out of the Old Salon the purchases have been, among the paintings, *The Quai du Bercy*, by M. Guillemet, 3,000 frs.; *The Halles*, by M. Dambourgez, 4,000 frs.; and a *Lock on the Sarthe*, by M. Garaud, 4,000 frs.; with two pieces of sculpture, *Nourricière*, in marble, by M. Chatrousse, 12,000 frs.; and *Le Vin*, in bronze, by M. Holveck, 9,000 frs. From the New Salon in the Champ de Mars two vases in *grès émaille*, by M. Delaherche, were obtained for 700 frs.; a statue in marble, *La Jannette*, by M. Baffier, 5,000 frs.; and two pictures, *The Arènes at Arles*, by M. Montenard, 3,000 frs.; and *The Dinner*, by M. Tournes, 2,500 frs. One pastel was purchased from the exhibition of the Indépendants, *A l'Ombre*, by M. Gozlan, for 1,200 frs. The purchases have amounted to 44,400 frs.

THE BERLIN EXHIBITION.

MANY people have expressed dissatisfaction with the awards of medals to exhibitors in the English Section of the Internationale Kunst-Ausstellung of Berlin, because the awards do not correspond with the English estimates of the value of the artists. It generally happens, however, that if such distinctions are honestly given by a jury of artists, and are not prescribed by officials, they cannot be in accordance with the ideas that prevail among the countrymen of the exhibitors. This will be more evident if we remember that in the majority of instances exhibitions, although called international, are not in reality representative of the work of any country. Take the case of England. The artists whose works are most admired find little difficulty in obtaining purchasers for all their pictures. The owners are naturally chary about lending their property unless they are assured of its safety, and it is not easy to satisfy them on that point. There is no doubt, for example, that the completeness of the Manchester Jubilee Exhibition was mainly owing to the association of the house of AGNEW with the enterprise. It was accepted as a matter of course that the partial exertion of such control as Messrs. AGNEW's was a guarantee that the risks attending the transit of works of art would be minimised, and that precautions would be taken to insure safety during the time the exhibition was open. No Government department could succeed in attracting such treasures as were to be seen in the sheds at Old Trafford, and if the committee desired to utilise more pictures, there would be no difficulty in obtaining them.

It is not every exhibition that can offer similar security, and in consequence the choice of works is limited. Instead of beseeching owners to put up with blank spaces on the walls of their galleries for an indefinite time, the committees and promoters of exhibitions must turn to artists for the use of some of the unsold works in their studios, and in that way general and international exhibitions become supplementary to the annual exhibitions of societies and the displays in brokers' shops. It thus happens that, among all the works by English artists which are to be seen in the Berlin Exhibition, only one is described as coming from a public or private collection. England is, however, not peculiar in displaying unsold works; the majority of the pictures from other countries also await purchasers.

In stating these facts we have no wish to depreciate any of the paintings, but at the same time it is well to explain that the Berlin Exhibition is not made up of works that were selected as evidence of the height reached by the painters in various parts of the world. It is simply the best collection that could be made up in spite of many difficulties, and the value of the awards should be determined accordingly. It is not to be supposed the jurors believed that the artists who obtained high-class medals are the foremost in their respective countries. The judgments were determined solely by what was visible in the various sections of the exhibition. Their value, so to speak, is local and counts for nothing outside the triangular plot of ground between the Strasse Alt-Moabit and the Invalidenstrasse in Berlin. In any of the beer-gardens of the city where artists congregate, the awards would be discounted like the criticisms in the evening papers.

Experience in Berlin as elsewhere denotes that it is time for the bestowal of medals in connection with art exhibitions to be given up. The operations make artists ridiculous. The conditions for such a competition can never be arranged fairly. A limited number of men are judged by works which may not be the most characteristic examples of their skill, and their rank is thus settled by chance. But still greater injustice is inflicted on absentees. It is commonly supposed that as a matter of course every exhibition like the one in Berlin must contain works by the foremost artists, and thus, unless they make announcements on all sides that they are not co-operating, the absentees are considered to have suffered defeat because their names do not appear in the list of medallists. On the other hand, men of inferior ability, through the accident of appearing in a circumscribed exhibition and obtaining a medal, may be raised for the moment to a prominence which they cannot be said to have earned and which they cannot retain.

Although the Berlin Exhibition consists of elements that are fortuitous in combination, and the judgments of the jurors cannot be accepted by contemporaries and are not likely to be endorsed by posterity, the sections contain much that will delight artists and amateurs. Since international exhibitions began not one was seen that, as regards painting in oils, was more interesting. Elsewhere the art was compelled to compete with the numerous varieties of industrial work and natural products, but in Berlin it is supreme. Students of painting in particular cannot fail to profit by an attentive examination of works which may be said to embody many theories and traditions. The pictures are so hung as to allow of the study of detail, and as the various schools are kept together, national and local characteristics can be discriminated from those which pertain to individual artists.

On plan the buildings may be said to consist of three principal parts. First is a large square, comprising the courts assigned to Hungary, Austria, Italy, Holland, Belgium, Spain, Denmark, Russia, Norway, Poland and America. There is also an "internationaler Saal," in which works from many countries are found—France and Turkey being among them—but somehow English works are excluded. The Kaiser-Saal forms part of the square. Along two of the sides are several compartments, in which works on a small scale are seen. The second division is almost semicircular in plan. It contains in the middle the English section, which adjoins the Düsseldorf. Along the curve are also compartments for water-colours, pastels, engravings, &c. Finally comes the German building, with sections for Berlin, Dresden, Munich, Karlsruhe and Stuttgart. A separate building contains architectural drawings. The grounds are well-laid out, and among the attractions is an excellent copy of a Greek Doric temple, which at present enshrines a panorama of Constantinople painted by the members of the Verein, which is as illusory as most of those which are the work of specialists. The exhibition building has a satisfactory façade, and is surmounted by a dome, which is adorned with figures that are skilfully foreshortened and have a vivid appearance. The Kaiser-Saal appeals to the hearts of all Germans, for it contains portraits of some of the actors in the scenes connected with the formation of the Empire. But while Count MOLTKE is duly honoured—the portrait of the Field-Marshal on his death-bed shows the fine lines of the skull which in life were concealed by an ugly wig—there is no portrait of Prince BISMARCK.

The German section reveals how far removed the modern paintings are from those which were produced from thirty to fifty years ago, and which still are supposed to reflect the qualities of German art. In colouring, especially, there is a vast difference. As yet the painters have not gone so far as some of their Austrian brethren in the search after chromatic effects, and they are not as successful as the French in the use of quiet colours and in compelling a variety to unite in producing an effect that seems impossible by any other or a simpler arrangement. But if much remains to be done, much has been accomplished, and the German section is one of the most gratifying in the exhibition.

When it is remembered that Germany has gained her supremacy by war, it is astonishing how few pictures of military scenes are to be found in the exhibition. After going through all the independent sections it may be doubted if a visitor could discover half a dozen paintings that relate to the war with France, while the campaign against Austria appears to have passed into the mythic period. There are, of course, portraits of military officers, but they are not shown in action or with such surroundings as at one time in England were considered to be as indispensable as the uniform when the subject was a soldier. In the windows of print shops in German towns there is a similar absence of military scenes. Everywhere there is pride in the army, and there is no forgetfulness of what has been accomplished by disciplined courage; but it seems to be accepted that neither artist nor writer is requisite to keep up the war spirit in any part of the empire. Judging by the paintings, it might be concluded that the Germans are more domesticated than the English. Scenes of simple life are in a majority, portraits as much abound as in an exhibition of the Royal Academy, and there is no lack of landscapes, the subjects being mainly derived from native

scenes. High art seems to be as little patronised as among ourselves, ancient history is rarely utilised for inspiration, and the ideal figures which at one time enabled German artists to display their splendid if somewhat archaic draughtsmanship are out of fashion, or at least for pictures.

There is one class of work which may be said to be peculiar to Germany, and there are many most interesting examples of it in the exhibition. It is known as "Diplome," which may be translated as illumination as applied to addresses. The Germans exceed all other peoples in complimenting and congratulating, for the terms used and the manner of using them suggest genuine cordiality. In England the presentation of addresses is common enough, but the composition is more stiff than anything to be found in a ready letter writer; while the caligraphy is manifestly a production of the law-writer's office, and recalls those ponderous "indentures" on parchment which no party thereto looks at a second time unless under compulsion. A German address is a work of art, and generally shows more inventive power than is seen in the majority of the oil-paintings. The subject inspires novelty. The address may be congratulatory on a birthday or a silver wedding, a testimony of good-fellowship to an emigrant, or of affection from students to a professor, or of gratitude from employés; it may be a humorous "trinker-historie" which will recall happy nights in a keller of which the walls seemed to be an anthology of wise and witty versicles, or a dutiful acknowledgment of loyalty from subjects to a prince; but whatever may be the purpose any competent artist can turn it to account and introduce in the address graceful figures, and that fine and affluent type of ornament which belongs to the German Renaissance. Is it not better for young artists to exercise their talents on work of this kind than remain moping in studios or taverns until the time arrives when the public will be willing to compete for possession of their oil-paintings? There must be a large sum spent every year in England for addresses which, from the style of execution, the possessors are generally afraid to hang in their houses. An imitation of the German practice might therefore be introduced with advantage. An illuminated manuscript like one of those in the Berlin Exhibition would be worthy to adorn a palace, and to be the companion of pictures or statues.

The English section contains about fifty oil-paintings, besides water-colour drawings and etchings; as they have been seen in exhibitions in England the titles will recall their appearance. Sir Frederick Leighton sends an *Idyll*, an Arcadian shepherd piping before two girls, and a *Sibyl*, a figure of a mild prophetess clad in a purple robe, who regards a scroll. Sir J. D. Millais has one portrait, *The Last Rose of Summer*, a girl in a dark-red cap that has no sign of pining or of approaching dissolution. For so hale and hearty a girl the title is a misnomer, and may not be owing to the painter's invention. Sir John Gilbert sends a picture of men crossing a lake, which is described as a subject taken from "Sir Lancelot of the Lake." Sir J. D. Linton has a portrait of *Miss Wardour*. Mr. Watts is represented by one of his ecclesiastical allegories, *Christenthum*, which is a painted sermon to all churches, and by his *Professor Joachim*. The former has faded in the course of its journeys to exhibitions, but the portrait remains a masterpiece. Mr. Ouless has two of his best portraits, the *Cardinal Manning* and *T. S. Cooper, R.A.* There are four portraits by Mr. W. B. Richmond besides his *Venus and Anchises*, which is not his best work. Mr. Herkomer sends six works, and, as a matter of course, *Mein Vater* and *Unser Dorf* figure among them. Mr. J. J. Shannon has two portraits. Mr. Walter Crane rarely meets with justice in a picture exhibition, and his animated painting of the fleeting hours, *Die eilenden Stunden*, is placed as high in the Berlin-saal as it would be in London. But the vigour and skill in arrangement cannot be entirely obscured. Mr. Alma-Tadema contributes his *Adrian at a Romano-British Pottery*, but as no marble is apparent, there must be much disappointment among visitors, that is hardly compensated by the mosaic, woodwork and pottery which are the principal elements in the painting. Another picture of the same period is Mr. Madox Brown's small replica of one of his mural paintings in the Manchester Town Hall, representing the laying-out of "Castræ Mancuniensia" under the direction of Roman soldiers. It is a picture that is historically interesting, as a record of the intensity of English pre-Raphaelitism. Mr. Poynter's cabinet work, *On the Temple Steps*, a Roman girl at a privileged fruit stall, reappears in Berlin. Mr. Stanhope Forbes's *Auction*, in which the pathos is deepened by the prosiness of the transaction, is enough to suggest the principles of the Newlyn school. Mr. Colin Hunter's *See-Silber*, a northern harbour with fishing-boats, refreshes the eyes; and as the blues in the *Westwärts*, by Mr. Henry Moore, have become softened, and the sun does suggest a glow, it must also please many an inland dweller. Mr. E. A. Waterlow merits much for discovering Connemara. *Die Waise* shows a shepherd boy who is a careful nurse for motherless lambs, but the group is subordinate to the landscape in which an arm of the Atlantic, a quiet lake and great purple mountains combine with the greenest of pasture, and all appear as if no more than a transcript from a real scene. A picture from one of Shakespeare's plays would secure more attention in Berlin than in London, but English artists know the risk of painting one. That the power of representing dramatic or melodramatic incidents on canvas has not entirely vanished is shown by Mr. Pettie's *Traitor*, where a man is seen lying on the floor at the mercy of his fellow conspirators. The scene is impressive, while free from all exaggeration or staginess. The painter's *Head of a Spanish Admiral* seems to be a portrait of a gentleman who could not have shared in the defeat of the Armada.

In addition are paintings by Mr. Boughton, Mr. J. Collier, Mr. Haynes Williams, Mr. Yeend King, Mr. Moberley, Mr. D. Murray, Mr. Moscheles, Mr. H. R. Robertson, Mr. Wirgman and Mr. Wyllie. The water-colour drawings are by Mr. Abbey, Mr. Parsons, Mr. Aumonier, Mr. T. Collier, Mr. Cuxmoore, Mr. A. East, Mr. Fulleylove, Sir J. Gilbert, Mr. C. Green, Mr. C. O. Murray, Mr. Orrock, Mr. Walker and Mr. Werner. It is needless to say that several prominent artists are absentees.

(*To be continued.*)

RECENT GERMAN ORIENTAL EXPLORATIONS.

ALTHOUGH for many years Germany has occupied the leading position in Oriental studies and the work of her students has been characterised by a most thorough investigation of the subject, it was not until quite recently, says the *Scotsman*, that the Germans entered the field of Oriental exploration. The old Museum at Berlin, built in 1828 by Frederick William III., remained for a long time without any Oriental collection. From time to time consuls in various parts of the East forwarded objects to the Prussian Museum, and one of the best collections is that of Oriental gems obtained by Baron Petermann during his travels. In the year 1845 there was discovered at Larnaca, in Cyprus, the site of the ancient Kition, a black basalt monolith with the figure of an Assyrian king upon it, the front and sides of which were covered by a long inscription in archaic characters. Previous to being noticed by European archæologists, the sculpture had been sawn in half lengthways, and the back position of it was known to have done duty for some years as the counter in a baker's shop. The larger portion was obtained by Mr. Ross, a well-known Eastern traveller, for the Royal Museum at Berlin, and was found to bear an inscription of Sargon II., B.C. 721, the conqueror of Samaria, who sent the monument to Cyprus to be erected after having received tribute from the kings of that island. Anxious to have, at least, some representative examples of Assyrian art, the late Baron von Bunsen, Prussian Ambassador in London, obtained casts of many of the best of the sculptures obtained by Sir Henry Layard. It was not until the year 1888, however, that Germany began to take an active part in Oriental exploration. In 1886 and 1887 a private expedition had visited Babylonia and the districts of Northern Syria; and the report brought back by this mission was so satisfactory that it was determined to take more systematic measures. This resulted in the formation of the Oriental Committee, under the presidency of the well-known archæologist, Professor von Kauffmann, which numbers among its members almost all the best known archæologists and Orientalists in Germany. The first work of this committee was to despatch an expedition to Asia Minor to study the Hittite antiquities. Having traversed the great military and commercial road which intersected the country from the slopes of the Taurus to the

shores of the Ægean, the expedition, which was under the direction of Dr. Humann, decided to commence operations at a site where some antiquities had been obtained a few years previously. The mound of Sendscherly is situated on the old road which leads from Marash through the plain of northern Syria along the eastern slopes of the Taurus down to the Gulf of Alexandretta, the ancient Bay of Issus. The mound is situated near to a pass through which a roadway leads into the Cilician plain, and was evidently the site of one of the celebrated Cilician gates. The work of excavation brought to light the remains of an extensive palace, strongly built of black basalt and dolorite, and decorated with numerous sculptures in the archaic style of Hittite art. Many of these have been transmitted to Berlin, and of others careful casts have been taken. The entrance to the palace was guarded by a pair of colossal lions, rude and archaic in style, resembling somewhat the lion found at the entrance to the temple of the war god at Nimroud, near Nineveh. They also present a slight similarity to the sphinxes found by Perrot at Eyuk. The sculptures which decorate the building are extremely interesting. They show a curious mixture of the art of Assyria and Egypt—the result of a long-continued contact with both nations. In one example, which perhaps is a gravestone, the fusion of the two styles is very remarkable. On the left-hand side of the bas-relief there are portions of the large figure of a god clad in a long robe in the Assyrian style, and wearing turned-up shoes. He holds in his hands a species of rude guitar, and may have been the Hittite Apollo, perhaps another form of the Cypriote Gingiras. In front of the figure is a small table altar with cross legs, and upon it a pile of offerings consisting of bread, fish and the head of a goose or duck.

Now this object is extremely curious, as it is manifestly a copy of the table altar so often occurring on the Egyptian funereal tablets, and which is described as the table upon which are placed all good things. The priest, who stands beside the altar, is evidently one of the *galli* or eunuch priests, with a beardless, effeminate face, having his hair in long ringlets and wearing earrings. He has in one hand a libation cup and in the other a long feather fan. At the bottom of the stole is a representation, apparently of the warrior to whom it was erected, who holds his lance in his hands point downwards indicating death, and leads by his side a horse. The whole style of this monument is very archaic, and may be attributed to certainly the fifteenth century B.C. Many of the forms discovered here are familiar to us in Greek art, and are extremely important as showing the source from which they came, and the enormous influence which the symbolism of Asia Minor had upon the Greek sculptor. We have the winged horse-headed sphinx, a curious form of Pegasus, the eagle-headed demon and the Asiatic female sphinx, a form introduced into Egypt by the Hyksos conquerors from throughout the shores of the Mediterranean, and on the archaic stole at Olympia and on a Phœnician plaque found in Sardinia. In the figures of Hittite warriors here the form of the shield is very remarkable, as it is exactly the form which the Greek vase-painters gave to the Trojan shields, and is also, curiously enough, the form found in the bronzes in the tombs at Spata and in Sardinia. The question now arises, have we any information as to the name of this ancient city kingdom? This we can fortunately answer in the affirmative. In one of the chambers of the palace were discovered the remains of two colossal statues in black basalt, resembling very much in character Phœnician sarcophagi. The larger of these has the head preserved, and represents a curious bearded and long-locked divinity wearing a horned cap. This is evidently a solar divinity. Upon the body of the figure there is written a long inscription in Aramaic-Phœnician characters, which states that it is the statue of the god Hadad, dedicated by Panamnur, King of Samal. Now, Panamnur was a contemporary of Tiglath-Pileser III., and paid tribute to him at Damascus in 732, along with Ahaz, King of Judah. The kingdom of Samal was a very old one, and is mentioned as early as 1600 B.C. in the list of Thothmes III. It seems to have been one of the leading centres of the confederacies of Northern Syria. There remains one other very important monument to be mentioned. In one of the rooms was found a stone monolith, about 10 feet high, which bore a long inscription of Esarhaddon, son of Sennacherib, describing his conquest of Egypt and the capture of Memphis. The inscription tells how a battle took place on the frontiers of Egypt early in the mouth Tammuz, and was followed by two other battles on the 16th and 18th days of the month, resulting in the capture of Memphis on the 22nd day of the month, after half a day's fighting. On the front of the monolith is a representation of Esarhaddon, and at his feet figures of two captive kings. One of these is a negro wearing the royal crown of Egypt, with the sacred serpent on his brow, and is evidently meant for Tarhaka, the Ethiopian king of Egypt. The second figure is probably that of the King of Samal. The discovery of this monument is extremely important, as it gives a marvellous description of one of the most important events in Oriental history. The discoveries at Sendscherly afford another striking example of the enormous wealth of material which lies buried beneath obscure Turkish ruins, and it is to be hoped that the success of the German Oriental Committee will induce many others to enter this rich field, where "the harvest truly is plenteous but the labourers few."

JERVAULX ABBEY AND MIDDLEHAM CASTLE.

THE members of the Yorkshire Archæological and Topographical Association were enabled last week to visit Jervaulx Abbey and Middleham Castle. According to the *Leeds Mercury*, the owner, Lord Masham, of Swinton, regards present-day archæologists as an evolutionary product of the last quarter of the century, but gives them cordial welcome withal, despite that they are many. Not surprising was the greeting, since coming mainly from the large towns—town-dwellers who are the more devoted to research because objects of investigation are removed from the crowd—they assume the form not of destroying angels, but of those professing a mission for the preservation of the "glorious ruins of antiquity." Such rare remains they were able, by Lord Masham's kindness, to investigate in Jervaulx Abbey and Middleham Castle. The excellence of the opportunity was clear to Yorkshire archæologists, else, despite the lowest barometer of the month, and the "very wet" prognosticated by the weather prophets, lady and gentlemen members, comprising contingents from Huddersfield, Bradford, Wakefield, Leeds, Harrogate and Northallerton, and conveyed by special train to Jervaulx, would scarcely have mustered to the number of quite three hundred to partake of the luncheon so kindly provided in the grounds of the newly-titled Baron of Swinton. This "bumper" excursion was truly a happy circumstance, since it celebrated the semi-jubilee of the Association. The results of the day's work and the charming weather enjoyed compensated for attendance and the incumbrance of umbrellas and mackintoshes, which occasional showers in the afternoon did not make quite superfluous. Under somewhat lowering skies, here and there relieved by patches of azure, the surrounding objects were most pleasant to look upon. How bravely these stood out in the landscape—the dark clumps of distant trees, the deep blue of the far-away hills, the light green of the opening vales; while along the incense-breathing country lanes, breaking the reaches between noble trees, were the meadow-sweet, woodbine, the dog-rose, bracken and waving grass, and beyond the tinted hedgerows red and white cattle, companies of sheep, and surprised groups garnering the hay.

Jervaulx and Middleham are words of import to those informed of their picturesque and historic associations. Few piles are in better preservation than the monastery of the White Friars and the great stronghold of Warwick, the king-maker. Jervaulx or Gervis stands in well-kept and picturesque grounds not far distant from the valley in which Miles Coverdale, translator of the English Bible, was born. The abbey was first founded A.D. 1141, in the reign of Stephen, by Acarius, son of Bardolf and nephew of Bodin, who gave land at Fors, in Wensleydale, to Peter de Quincey and other monks of Savigny. But the inclement situation led to removal to East Witton, on the banks of the Ure, where a colony from Byland commenced the house in 1150, and carried out its erection upon "one contemporary and consistent plan." It is recorded that the last of the abbots was executed at Tyburn for having taken part in the Pilgrimage of Grace, while readers of the Waverley Novels will scarcely need a reminder that Prior Aymer, of Jervaulx, was not an unimportant personage in the story of Ivanhoe. The buildings themselves, according to Mr. St. John Hope, were mainly arranged around the large square formed by the cloisters, and had covered passages on the four sides, forming communication between the church and the other parts of the abbey. There were two great divisions, one belonging to the learned friars and the other to the working and unlettered brothers or *conversi*, who were, however, not a lower class than the lettered monks. The abbey probably included about fifty monks and two or three hundred conversi. The former occupied the eastern side and the latter the western portion of the abbey; and they had also a similar division in the church, where walls were built between the pillars of the aisles. In many respects the abbey is similar in treatment to Fountains; but at Jervaulx the superstructure, save a picturesque piece of the monks' dormitory, has largely disappeared. Mr. St. John Hope spoke of the various relations of the structure to those of Fountains and Kirkstall, pointed out the uses of the buildings, and especially called attention to the plan of the church, where a complete altar remains, and to the handsome chapter-house with monoliths in marble. Passing along to Middleham the visitors crossed the cover, and singled out of the range of hills East Witton Fell and Pen Hill. The castle was founded soon after the Conquest by Robert Fitz Ranulph, grandson of Ribald, one of the followers of William;

but in the thirteenth century the castle and the lands of Middleham came by marriage into the family of Neville. Its most celebrated owner was Richard Neville, Earl of Warwick, "the setter up and plucker down of kings," who often at Middleham entertained Edward IV., against whom he afterwards contracted such enmity as to espouse the cause of Henry VI., whom he had been the means of deposing. This castle, with a keep said to be one of the finest in the country, consists of an outwork fortified with four towers, and enclosing the keep. Mr. Atthill says:—"This envelope forms a right-angled parallelogram 210 feet by 175 feet. The Norman keep, the fortress of the first lords, not being sufficient for the vast trains and princely habits of the Nevilles was enclosed by a complete quadrangle, and the first structure now stands completely insulated in the centre of a later work." A section of the party also visited Middleham Church, dedicated to St. Mary and St. Alkelda, the latter the daughter of a Saxon prince, and who suffered martyrdom by strangulation at the hands of the Danes. Her remains are supposed to repose in the church, and her name is preserved by a well hard by.

Luncheon was served in a tent in the abbey grounds, following the inspection of the monastery.

Lord Masham, who presided, observed that he understood the only toast on those occasions was that of "The Yorkshire Archæological Society." He was pleased to see around him such a numerous body, and he was only sorry that he had not known they were to be so numerous, else he would have been better prepared. That they had mustered so strongly he regarded as a compliment, because he believed that was the most numerous meeting the Society had ever held. Although not an archæologist, he had listened with considerable interest to the learned and entertaining lecture upon the abbey by Mr. St. John Hope, and he trusted that a printed account of the old abbey might be issued, because the details presented differed from that previously given to him, and certainly it was very important that the truth should be made known. If 150 years ago they had had such a body of archæologists—if the Lord of Jervaulx could have been surrounded by such a body of archæologists as he saw around him that day, they might not have now had before them at that place the wreck of to-day, and they would have needed no learned expert to indicate to them the character of the abbey as it formerly existed, since they could have seen for themselves the points of the buildings and the uses to which the various parts had been assigned. He supposed, however, that on the Darwinian principle the archæologists must have been evolved during the last quarter of a century, at any rate, they had become very numerous during that period. Speaking personally, he had a stronger liking for castles than for abbeys, and he had much rather that the castle of the Earl of Warwick at Middleham had been preserved than the abbey at Jervaulx, although the latter might have been a very fine structure. They had many abbeys, but they had only one castle belonging to Warwick the King-maker, and he thought had it been properly preserved it would have been one of the most interesting relics of olden times. Had it remained in its former state, it would have been worth half of Wensleydale, since pilgrims from all parts of England, Australia and other places inhabited by English people would have come to inspect the glorious remains of that old stronghold. But the people, by their parsimony, had been led to pull down parts of the structure, and to build barns of the material and that sort of thing. He hoped that in future better care would be taken of what was left. That historic castle once belonged, according to Bulwer Lytton, to "The Last of the Barons," and perhaps they might allow him to say that it belonged once more to the last of the barons.

Colonel Brooke (chairman of the Council) responded. He congratulated Lord Masham on succeeding to the magnificent domain of Jervaulx; but if he gathered his feelings aright he felt more proud of being the successor of the Salisburys and the Warwicks and the great family of Neville in the stronghold of Middleham. The domain had fallen into the hands of a worthy successor, and he trusted those who followed his lordship might long be spared to preserve and enjoy these grand remains, and to hand them down for many years with the same feelings which his lordship had so well expressed that day. On behalf of the Society he thanked Lord Masham for the cordial reception given them, and also Mr. Christie, who had so energetically seconded his lordship's efforts in the arrangements made for their reception. He begged to propose the health of their noble entertainer—Lord Masham.

Lord Masham, responding to the toast, said that in preserving these historic remains it was very difficult to know—and it was very desirable people should be taught—how rightly to preserve them. Some persons stated that ivy destroyed an old ruin, and others made assertions to the contrary. He was very anxious, and Mr. Christie, who lived at Jervaulx, was very anxious to know which was the better course. But doctors differed, and some questioned what, without ivy, a ruin would be worth. While the tooth of time would little by little take away a building as well as other things, it was for archæologists to say what was desirable for its utmost preservation.

A vote of thanks was passed to Mr. St. John Hope, on the motion of Colonel Brooke, who also proposed six new members for adoption.

Mr. St. John Hope, responding, said he would be glad to prepare for publication in the "Yorkshire Archæological Journal" a description of the abbey. With respect to the ivy question, he was one who held that while ivy was an extremely beautiful plant in its proper place, he did not consider that any ancient ruin was the proper place for ivy. Ivy was extremely picturesque, and one regretted its removal from that point of view. But it became a question whether an abbey was to exist for the sake of the ivy, or whether the ivy should be allowed to pursue its pernicious work of reducing a ruin, stone by stone, until our successors in a few centuries would have no ruin to admire. He held that it would be selfish to allow the ivy under such a prospect to continue its wicked course. Lord Ripon had allowed him to deal with the ivy at Fountains, and one of the last things Lord Edward Cavendish did was to assent to its removal from Furness Abbey and to the walls being carefully pointed. He was glad the ivy was not doing as much damage at Middleham as at Jervaulx, but for all that it should be removed. There were one or two parts of the great keep at Middleham which, unless propped, might fall at any time, and it would be sad for it to become a hopeless ruin, seeing that it was one of the finest and largest in the kingdom.

SCOTTISH ASSOCIATION FOR THE PROMOTION OF THE FINE ARTS.

THE report of the committee of management of this Society for the year 1890-91 states that, owing to the troubles in South America, the membership from that quarter had fallen off to some extent. The subscriptions for the year had amounted to 2,319*l.*, whereof Edinburgh contributed 824*l.* Out of the sum placed at their disposal, the committee had purchased, at a cost of 349*l.* 9*s.*, from the recent exhibition of the Royal Scottish Academy, and at a cost of 194*l.* 2*s.* from the exhibition of the Glasgow Institute of Fine Arts, twenty-two works of art, of which seventeen were oil-paintings and five were water-colour drawings. In addition to the purchases from the Royal Scottish Academy and from the Glasgow Institute of Fine Arts, the committee had commissioned, at a cost of 221*l.* 13*s.*, the late Sir William Fettes Douglas to execute three, Mr. R. B. Nisbet four, Mr. C. H. Mackie three, and Mr. James Paterson three water-colour drawings illustrative of the scenery on the river Tay—these drawings being included in the year's distribution. The three drawings by the late President of the Royal Scottish Academy were among the last works done by him. They were very beautiful specimens of Sir William's work, and would be much valued mementoes of the eminent artist. The committee took the opportunity of recording their deep sense of the loss sustained by Scottish art in the death of Sir William Fettes Douglas, several of whose paintings had been among the most valuable prize works of art purchased by the Association. The committee reminded the members of the Association that the presentation work for the year 1885 consisted of a volume containing a series of eight engravings (photogravures) from paintings by Sir William Fettes Douglas, with a portrait and biographical sketch of the president. The presentation work for the year consists of a volume, suitable for library or table, of reproductions of the water-colour drawings by Sir William Fettes Douglas, Mr. Nisbet, Mr. C. H. Mackie and Mr. Paterson, in illustration of the scenery of the river Tay, and containing descriptive notices of the scenes represented. In consequence of the expression of a desire by many of the subscribers that the next presentation work should consist of an important single plate, the committee came to the opinion that it would give general satisfaction to the subscribers were they to be presented with an etching on a large scale of an important painting by one of the old masters, and they had the pleasure of reporting that the Earl of Elgin had given permission to the committee to etch the famous equestrian portrait in his lordship's possession of the celebrated statesman Don Gaspar de Guzman, Comte-duc d'Olivarès, minister to Philip IV., contemporary of Buckingham and Richelieu and patron of Velasquez. The committee took the opportunity of publicly tendering their acknowledgments to Lord Elgin for his great kindness in consenting to allow the picture to be etched. They had commissioned Mr. Hole, R.S.A., to execute the work. The sum at the credit of the National Gallery fund was reported to amount at present to upwards of 500*l.*, including ½ per cent. of the year's subscriptions, in accordance with the charter of the Association. The total sum expended up to this time by the various committees of management in the acquisition of paintings and sculpture

for the members, in the purchase of pictures for permanent preservation in the Scottish National Gallery, and in the production of engravings and illustrated works for circulation among the subscribers, now amounted to upwards of 175,000*l.*

TESSERÆ.

Detail in Painting.

THE contempt expressed for paintings of fruit, flowers, and what is called still life, is, like most other general and unqualified expressions of the kind, unjust; for though it be true that an artist may be able to paint such things well without possessing skill in any of the higher branches of the art, the converse is not so, no artist having been able to paint great things well who could not also paint little things. In the grandest and most perfect production of the pencil, the *Peter Martyr* of Titian, all the trailing plants, spreading leaves and flowers which decorate the foreground are painted from nature, with all the accurate truth of a botanist, though with all the light, airy, playful brilliancy and harmony of effect of a great master. We are aware, indeed, that Sir Joshua Reynolds has hastily denied the fact, and the merit of it if it were so; but the picture, though injured, is still existing to attest it; and if significant and entertaining objects can be employed in such decorations, common sense proclaims them to be preferable to unmeaning blots and random flourishes, which, like all other ornaments signifying nothing, have an offensive character of obtrusive affectation. Hence, so far from despising skilful and elegant imitations of such objects, all the great masters of the art have studiously practised and successfully employed them; and, in proportion to their general excellence in the whole, has been their particular excellence in these subordinate parts. The leaves, fruits and flowers of Titian and Rubens are far superior to those of any professed and exclusive painter of such subjects, and their vases, phials and implements to those of any other artist whatsoever. Even the patriarchs of the truly grand and severe style, the founders of the Roman and Bolognese schools, found it expedient to pay no less attention to these matters of decoration, as the fruit in a picture of Ludovico Caracci, in the Earl of Ashburnham's collection, and the writing-desk, inkstand, books and hour-glass in a portrait of Cardinal Ribbiena by Raphael, publicly exhibited some years in London, may sufficiently evince. Teniers might have envied the fidelity, delicacy and transparency with which the latter are finished. Neither did Salvator Rosa, the most bold, negligent and sketchy of the great painters, think it beneath him to attend to such matters, as appears by the admirable truth, force and brilliancy with which the withered leaves, tattered volumes and bones of fishes and animals are finished in his picture of Democritus.

Colour in the Arts.

The thing in the sense of art called "colour" is never absolute in itself, but derives its value, like the varying lots of human life, from comparison with what is next and around it. The same tint will be bright or dull, according to its environments. As a rule, no colour in a fine work will be found so bright as it looks, and inversely, no colour in bad or ordinary work will look so bright as it is. A tawny sail on a gray sea and sky by Ruysdael will shine like a ruby, while all the reds, blues and yellows, indiscriminately shuffled together, as in some of the painted glass of the present day, will fail to produce the effect of brilliancy, and, indeed, each of them will destroy its neighbour. Of this principle of interdependence in the scale of his palette the true painter becomes more and more conscious, his chief art being to work it out in practice. But no similar consciousness can be attributed to unreasoning races. Therefore, for such evidences of the prevalence of fine colour as are found among them, a different operation of the same principle must be sought. In countries where there is much light we shall invariably find rich and harmonious colouring in the costumes of men and the trappings of animals. Much light bleaches the landscape, and for the greater part of the year, and, in some localities, for the year round, the eye rests only on an arid and neutral-coloured world. This monotony renders all colour, as such, both precious and distinct. Nature sets the example by the brilliant plumage of her birds, and the hues of smaller creatures—a brilliancy never raw or crude; and nature herself gives the materials as well as the example for the same harmonies in the accessories of human life. Eastern races have for ages been aware that only the rich and true colours supplied by their native dyes—the madders, indigos, &c.—and their combinations, will stand the hot and dazzling conditions of their climate. The use of these colours has therefore become such a mere habit that the reasons for their preference may be said to be forgotten. The selection of the fittest has been made for them by nature herself; it being reserved for the Englishwoman in India, who ignores this law, to discover with dismay the dirty mixture to which her fresh Parisian dress in the last tint of the fashion is promptly reduced. Even in their fadings the dyes of India and Arabia—aided by the quality of the native wools, which have an affinity for them—maintain their relative harmonies; and the painter will often prefer the worn rug or robe to the new one. Nor must we overlook another reason for richness and depth of tone, equally independent of the taste of man; namely, the use of colour as an ingredient of distinctness. Seen from afar, across the neutral mass of the ocean, the brilliant hues of the ship's flag or pennon are no matter of mere taste or fancy, but of necessity. In the same way the robe and the turban of the traveller in the desert, and the housings of his horse or camel, have their allotted purpose. Thus it appears that the harmonious combinations of the Persian carpet or Indian shawl are hardly to be credited so much to the "feeling for colour" of the native weaver as to the light and heat which render all false tints fugitive and which these combinations alone resist; the providence of nature having also bestowed materials in which he can hardly go amiss. Not that we would deny to the Eastern weaver, who in such countries offers the only approach to the position of a painter, the exercise of taste, and that sometimes of a high kind, the result of the culture of the eye under long-continued traditional arrangements; but he moves and works, to a great extent, in a groove formed for centuries before him. To turn now to our own land, where, far from having the light and heat and consequent neutral monotony of landscape to which we have endeavoured to trace the use of the rich colouring of the East, our native landscape presents, more or less, all the year round, a mass of that colour most foreign to the Oriental eye and most grateful to our own, namely, that of a soft and refreshing verdure. We sigh for nothing better, nor for more harmonious correlatives than the time-worn hues of stone or brick—the gray church tower and the old brick mansion—the neutral yellows and grays of the cornfield, whether in ear or stubble, and the ever-changing varieties of gray and luminous cloud, all of which receive a relative value from the surrounding green. Other forms of so-called "colour," such as masses of sparkling mosaic, patches of enamel, painted architecture, even precious marbles, are not what the prevalent tones of English landscape and sky really relieve. The lady's Indian shawl is known to be the true and choice thing by a limited jury, but, in her heart, the lady's maid thinks it a dull affair to have cost so much. For we have not light, and therefore neutral tint enough to set it off. That under these differing and even unfavouring conditions English art, from the period of its revival, should have been pre-eminent in the quality of "colour," may be said to be in some degree also the natural consequence of our external world. Dingy cities and gloomy skies engender the desire for mimic scenes of greater brightness. It is characteristic that modern Italian painters frequently choose those misty effects they seldom see—we have too much of them.

Titian as a Painter.

How really to distinguish Titian from the numerous good Venetian painters of his time is a question only answered by an experienced eye. For pictures are like brothers and sisters; however strong the family likeness between them, it vanishes when each member becomes well known. It is soon found, therefore, that Palma, Tintoret and Bonifazio are really as distinct from Titian as from each other. There are works by Titian, such as his *Bacchus and Ariadne*, and his tragically and probably treacherously destroyed *Peter Martyr*, which stand alone as his. But, for purposes of comparison, we must take him in the range of subjects more common to the school. Here he may be distinguished not so exclusively by his colour, his drapery, or his modes of composition, though individual in each, as by the quality he understood to give to his surface. No one more effectually attained that concealment of his means which is the aim of every true painter. His work shows no paint. What is technically called "the palette" is imperceptible. He perceived that in nature texture lies beneath colour, and that the one must be obtained in order to command the other. He observed that nature expresses her differences not only by contrasts of black and white, red and green, or blue and yellow, but by appositions of the transparent and the opaque, the hard and the soft, the rough and the smooth and the dull and the sparkling—each relieving and making prominent the other. For "things, save by their opposites, appear not." The colours he used are known to have been few and common; it was the infinite changes he rang upon them, the varieties of surface he extracted from them, which produced his subtle and mysterious gradations. No one studied the chemistry of effect as he did; the superposition of one tint upon another, the blood beneath the skin, the light within the shade, the colour in the depths. No one so far carried the power which gives to the result of skill the appearance of happy accident. Titian's pictures seen in an early stage were described by a contemporary as "gemmed all over" with solid touches and masses of paint, destined to be masked and united by an overgrowth of the subtlest operations of brush and finger. Palma Giovane, who was for years in Titian's school, has described how canvases in this state would be placed aside for

months, that the master would then lift them up and examine them with a sternness of expression "as if they were his mortal enemies," and set to work like one possessed. Nothing can be truer to life than this description. A painter staring into his first sketch is like a seer looking into futurity—dimly seeing what is to be. Palma Giovane adds that the master kept many pictures going at a time, turning from one to the other, laying on colour or blending tints with a rub of his finger, and, in the last operations, working far more with his fingers than with his brush. Artists and connoisseurs have in vain interrogated the pictures themselves as to the method that produced them. It is told of a Bergamasque painter that in the endeavour to discover the secret of the transparency and luminousness of the blood tints he scraped a fine head to the canvas, and in vain. He might as well have pulled a flower to pieces to know how it grew. Had he asked Titian himself we may be sure the painter could not have told him. Feeling gropes its way to what it seeks, but has no precise rules for the route; where these begin nature leaves off, and mechanical mannerism takes her place. It was this pure feeling which taught him not only what to do, but when to have done. Titian touched and retouched, glazed and scumbled, veil over veil and film over film, but from no false fastidiousness, rather undoing in the end than overdoing the effect of finish.

St. Petronius, Bologna.

St. Petronius takes precedence of the cathedral of Bologna. Erected at the period of Bolognese liberty, about the end of the fourteenth century, at the expense of the parish, this church is a monument of the religious magnificence of the republics in the Middle Ages, and a proof of the eminence and importance of their artists. The architect Antonio Vincenzi was one of the sixteen *riformatori*, and had been ambassador at Venice. St. Petronius is resplendent with the beauties of art. The sibyls on the doors sculptured by Tribolo, the timorous fellow-traveller of Benvenuto Cellini, have the purity and elegance of Raphael. The prophets, the ornaments of the smaller doors, the basso-relievos of Adam and Eve, especially the figure of Eve spinning, with her first children embracing her knees, and the other figures by Jacopo della Quercia, are excellent. Michel Angelo supplied the designs for the magnificent but sombre-painted windows of St. Anthony's Chapel, and these fragile works reveal his power and expression. Among the archives are sixteen designs for completing the front of the church. Four are attributed to Palladio, but as on one of them he wrote "Laudo il presente disegno," it may be concluded that they are the work of one of his friends, for he was among the most unassuming of men. One design is by Vignola, which secured the approval of Giulio Romano and Cristoforo Lombardo; another is by his rival, Jacopo Ranuccio. There are also designs by Tibaldo, Peruzzi, Giulio Romano, Alberti da Borgo, San Sepolcro. One by Francesco Terribilia was approved by the Senate of Bologna in 1580. Cardinal Geronimo Gastaldi, legate of Bologna in 1678, offered to complete the front at his own cost on condition that he was allowed to introduce his armorial bearings as part of the design. The proposal met with a dignified refusal. The Cardinal, in order to gratify his passion for building, then erected two churches near the Porta del Popolo, Rome, which indicate his deficiencies of taste.

Egyptian Monuments.

Upon looking at the monuments of ancient Egypt anterior to the eighteenth dynasty we find two great groups belonging to distinct ages, which are in a certain measure connected, but certainly not linked together by other minor groups which can be proved to stand between them. The first of these groups is that of the pyramids of Gizeh and of the tombs surrounding them. These are unquestionably the oldest monuments of Egypt, and probably of the world. Their massive architecture, which wears an air of primæval antiquity, the similarity of their form to primitive structures in various parts of the world, and the archaic style of the sculptures of the tombs, alike prove their remote age. The subjects of the sculptures also differ greatly from those of later Egyptian art. One of the most striking and remarkable distinctions is the absence of representations of divinities and funeral rites, which are constantly found in tombs of a later period. The manners and customs belong to a primitive age. Labouring men are usually represented naked, which is not usual in other monuments; the chief occupations are connected with agriculture and the tending of cattle, and there is no trace of an army. The language appears in a more primitive form, and the inscriptions, which are for the most part merely descriptive of the sculptures, are very difficult to read. The second important group of monuments bears the names of the kings of Manetho's twelfth dynasty. They consist of a small temple, remains of other temples, tombs, obelisks and statues. The architecture is very different from that of the Pyramids, being less massive and more elegant. The sculptures, though still resembling in style those of an earlier date, exhibit a considerable advance. Separate statues have a better form and superior finish. The animals are admirably represented. There is still an absence of religious representations in the tombs, but divinities are portrayed upon other monuments. The subjects are of a less simple character than previously. The arts appear to have been more advanced, and life to have been more refined and luxurious. Soldiers are represented, and the labourers are usually clothed. The language is more developed, and perhaps may be considered to have reached its perfect state. Such is the impression which an intelligent observer would receive upon examining the monuments on the spot. He could have no doubt of the relative age of the two groups, but he would find no means of determining the period of time which intervened between them. He could see that no one in Egypt could possibly confound two such different epochs, and that therefore the priests would place, as a matter of course, the kings of the first group in an earlier dynasty than those of the second group. So far Manetho's account is confirmed by the monuments, but further than this we cannot venture to go before the eighteenth dynasty. Our real knowledge of the most ancient history of Egypt is almost entirely confined to the Pyramids and their builders.

"Pentimenti" in Italian Painting.

Nothing is more common than for copyists and dealers to show what the Italians call *pentimenti*, that is, alterations made in the composition of pictures during the progress of the painting, as proofs of authenticity in works attributed to these old masters; but they are in reality the direct contrary, their process, for the most part, allowing no such alterations. Giorgione, who was extremely deficient in drawing, and after him Titian, began with a dead colouring or substratum of middle tint, equally laid upon an absorbent ground spread over wood or cloth, which they worked up with repeated coats, till it reached their ideas of just imitation, and then finished and harmonised the whole with those glowing tints of thin transparent glazing which so few of their pictures now retain. By these means they not only obtained the power of altering and correcting their forms during the progress of their work, but also produced a greater variety of broken tints, which imitated more happily the deceptions of vision, and exhibited the appearance of all those little subordinate reflections and refractions which objects not perfectly smooth and even continually present to the eye. This advantage, however, it only retained in the works of the inventor and his immediate successors; while it furnished, to all the following generations of Italian painters, the means of painting without drawing, and thus contributed to sink them still deeper and deeper in that feeble, muddy opacity to which habits of imitation otherwise inclined them. Prior to the Caracci, indeed, the license of alteration seems to have been confined to mere corrections of detail, and never to have been extended, even in the minutest instance, to a change in the design or general composition, which, by accumulating strata of colours in the shadows, must necessarily render them muddy and opaque, as they frequently are in the works of the Bolognese school, and constantly in those of the Italian painters who succeeded to them, but never in those of Giorgione, Titian, Correggio, &c. These patriarchs of colouring knew too well the fatal consequences of changing their composition after the picture was begun not to digest and arrange it thoroughly in previous drawings, both of the parts and the whole; and the last is said frequently to have modelled his figures in clay before he painted them. By working, too, so much in fresco he had acquired an early habit of certainty and precision; so that a *pentimento*, which we have so often heard adduced as a proof of authenticity, is a most suspicious circumstance, and one of which we have never been able to discover a trace in any of the undoubted productions of his pencil. It is greatly to be lamented that Sir Joshua Reynolds, who was an enthusiastic admirer of him, did not proceed on the same principles, since, by continually altering his composition, he muddled his colours, and then attempted to render them clear, brilliant and mellow by vehicles of wax, varnish, &c., which destroyed them. If the old Venetian painters ever employed any such vehicles it was very sparingly, and only in the last glazing, with which they gave the general tone of harmony and effect to their pictures. This always vanishes with the original varnish under the hand of a cleaner, and therefore was probably applied in the same material. It may, indeed, be doubted whether Correggio ever practised, or even knew the Venetian mode, there not being, as far as we recollect, any known genuine work of him in which the substratum of body colour extends into the shadows. Rubens, like the rest of his countrymen, was educated in the original method; but both he and Vandyke, after studying the pictures at Venice, blended the two modes, or employed either, as transparency, brilliancy, richness and variety of tint were respectively aimed at. So likewise did Rembrandt, with a degree of skill and felicity peculiar to himself; but most of his countrymen adhered to the old practice, which is the cause of that clearness and truth that render the productions even of their inferior artists pleasing.

NOTES AND COMMENTS.

THE School of Handicraft in the East of London, which is under the honorary direction of Mr. C. R. ASHBEE, architect, has succeeded in surviving the three years' term which is fatal to so many infant associations. By rigid economy the school has not only paid its way, but has a balance on the right side of about 40*l.* More convenient premises have been occupied, and the director and committee propose to extend their operations by setting up a life class and an embroidery class, besides extending the courses in the existing classes. Among other undertakings contemplated are—(1) The training in workshop practice of young architects' assistants and pupils, especially such as work in the offices of East London firms; (2) the establishment of a special school of brazing and metalwork; (3) the revival of teaching in gold and silversmiths' work, with a view to accepting the offer made by a client of the guild, for the use by the guild and school, for artistic purposes, of one of the finest private collections of gems in England; (4) the development of the English leather industry in its decorative treatment, this being at present almost exclusively in the hands of the Germans; (5) the establishment of a guild and school press for the training of young printers; (6) the foundation of a university extension centre that shall have special bearing on the lines of handicraft conducted in the school, and thus bring the workmen and teachers of East London in direct contact with the old universities. But all this requires money, and so much good has been done already by them, that the director and committee have a claim on the generosity of all who believe in technical education of the best kind.

IRELAND, which has thirty-two counties, some of them having two divisions, possesses officers known as county surveyors, whose duties differ from those in the English shires. The majority of the Irish surveyors are competent civil engineers, and of late appointments are only given by competition. The emoluments are not extravagant. In first-class counties the salary is 600*l.* a year, in second-class 500*l.*, and in third-class 400*l.* The allowance for assistance is only 30*l.* a year. The county of Dublin is one of the smallest in the country, but owing to the number of roads that traverse it there are two surveyors. Prior to 1866 there were three surveyors, each with a salary of 350*l.* In 1866 the number was reduced. One of the surveyors is now seventy-three years old and receives 525*l.*, the other is a year younger and has a salary of 475*l.* The Grand Jury decided lately to recur to the original arrangements, that is to have three surveyors, but with salaries of 350*l.* each. In consequence the present holders of the office would be compelled to retire or to accept a very large diminution of income. Fortunately for them, it is necessary to obtain the approval of the Judicial Committee of the Privy Council before such changes take place. On Tuesday the application was considered at Dublin Castle, and the Lord Chancellor and judges, having a fellow-feeling for ancient officials, declined to recommend the Lord Lieutenant to approve of the proposed arrangements. For the present the two surveyors are safe.

THE Congress of Hygiene and Demography will begin at 3 P.M. on Monday next, in St. James's Hall, when the Prince of WALES will take the chair. The ordinary meetings of the sections will be held on Tuesday, Wednesday, Thursday and Friday. On Saturday there will be excursions, and the closing meeting will be held on Monday, August 17. It is announced that—"The aim of the Congress is to stimulate public interest in the progress of hygiene and demography, by which latter term is understood the study of the life conditions of communities from statistical points of view; and to afford persons interested in these subjects an opportunity of meeting, and of elucidating questions connected therewith by conference and debate." Section VI., "Architecture in Relation to Hygiene," will meet, under the presidency of Sir A. W. BLOMFIELD, in the West Examination Hall of the University of London, Burlington Gardens. The following papers are to be read:—Tuesday.—President's address. Open Spaces: The Earl of MEATH. The Hygienic Principles for the Extension and Internal Improvement of Towns: J. STÜBBEN, city architect of Cologne. The Hygiene of Groups of Dwellings at low Rental: CHARLES LUCAS, Paris. The Control of the Construction of Buildings: THOMAS BLASHILL, F.R.I.B.A. The Heating of Towns by Steam from Central Stations: S. M. BURROUGHS. Wednesday.—The Hygienic Composition of Walls of Dwelling-houses: EMILE TRÉLAT, Paris. Pile Foundations in Marshy Land, and the Exclusion of Damp from Dwellings: P. J. H. CUYPERS, Amsterdam. The Sanitation of Theatres: LENNOX BROWNE, F.R.C.S., Ed. Diagrams Illustrative of the Sanitation of Theatres: ERNEST TURNER. Some Insanitary Superstitions in House Building: H. H. STATHAM. Four-inch Drains *v.* Six-inch Drains: G. M. LAWFORD, C.E. Thursday.—The Principal Causes of the Unhealthiness of Workmen's Houses in Paris, and the Practical Remedies: EMILE CACHEUX, Paris. Common Lodging-houses: P. GORDON SMITH. Cottage Dwellings for the Industrial Classes: ROWLAND PLUMBE. Block Dwellings for the Industrial Classes: JOHN F. J. SYKES, M.B. Dr. KOCH'S new Institute: J. BÖTTGER, Berlin. Friday.—English Isolation Hospitals: R. THORNE THORNE, M.D. The Heathcote Hospital, Leamington: KEITH D. YOUNG. Temporary Local Isolation Hospitals as opposed to a Central Hospital: C. E. FEW, vicar of Seal. Hospital Tents and Huts: Dr. DUCHAUSOY. Asylum Arrangement and Construction: RICHARD GREENE, M.D., and G. T. HINE.

SOME months ago, when the sale of building materials and other objects took place at Arundel Castle, we called attention to a few of the lots which deserved to be purchased for museums. Among them were two remarkable figures in terra-cotta, each being about 10 feet in height. They were purchased by Mr. EDGLEY, who generously decided to present them to the parish of Lambeth. There is appropriateness in the gift, since the figures came from COADE'S pottery in Lambeth. They were probably modelled by JOHN BACON, R.A. Mr. MARK BEAUFOY, M.P., has undertaken the expense of erecting the statues in the garden of the Albert Embankment, opposite St. Thomas's Hospital, which is near the place of their production. The gift has been gladly accepted by the Lambeth Vestry.

A PETITION was presented to the French Chamber, but too late to be acted on this session, by a M. BERNARD, of Bordeaux, which has excited much interest among French painters. Of late years the prices paid for modern pictures in the Hôtel-Drouot indicate that property of the kind can become a most profitable investment; but, unfortunately, the creators of the property, or their representatives, cannot share in the profits. MILLET'S *Angelus* was not the only case where the artist was paid only a small fraction of the ultimate value of his picture. At the sale of the RŒDERER collection a pastel of the work for which MILLET received 3,000 francs—that is, more than he obtained for the oil-painting—was sold for 100,000 francs. THEODORE ROUSSEAU, the landscapist, sold his *Mare au Chêne* for 1,000 francs to M. RŒDERER, when the price obtained for it was 90,000 francs. A landscape for which DAUBIGNY received 2,500 francs realised 54,000 francs. Thus an outlay of 6,500 francs brought a profit of 237,500 francs; but not one franc went to the representatives of the artists. In 1848 CHARLES JACQUE was compelled to sell ten of his own paintings for 300 francs. For one of them 25,000 francs was paid in 1884, and there are signs that JACQUE'S works are likely to be appreciated by wealthy connoisseurs who can pay liberally for their hobbies. M. BERNARD in his petition implores the French Legislature to make arrangements to enable an artist, his heirs, executors and assigns, to obtain some participation in the good fortune which comes to early investors in his works. It is needless to say M. BERNARD'S efforts are Quixotic. He is evidently smitten with the copyright craze, which has made so many French artists fancy that all the world was ready to become impoverished to enrich the painters of bad pictures; but M. BERNARD wishes the enrichment to go on in perpetuity. He shuts his eyes to the probability of pictures for which big prices were paid becoming almost worthless in the market, although it is an everyday experience. Is he prepared to recommend that painters should in such cases make up the losses to the unlucky purchasers?





INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE, E C

RESIDENCE AT BECCLES.

ARTHUR PETTS, F.S.I., Architect.

INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

MONUMENT TO THE LATE LORD FRASER, RECENTLY ERECTED IN EDINBURGH.

R. S. LORIMER, Architect.



INK-PHOTO SPRAGUE & C° 445 EAST HARRISON STREET (LETTER LANE) E.C.

THE GRAND PRIX DIPLOMA: PARIS EXHIBITION, 1889.

Designed by P. V. GALLAND.

The Architectural Illustration Society. Second Series. Plate N°. 395.

The Architect, Aug. 7th 1891.



ST. THOMAS CHURCH, STREATHAM.

SPENCE W. GRANT, A.R.I.B.A., SIDNEY R. J. SMITH, A.R.I.B.A., Architects.



RESIDENCE, MOSS

Messrs. ESSEX &



BIRMINGHAM.

Architects.

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 394.—MONUMENT TO THE LATE LORD FRASER, EDINBURGH [R. S. LORIMER.]

NO. 395.—THE GRAND PRIX DIPLOMA: PARIS EXHIBITION, 1889 [P. V. GALLAND.]

RESIDENCE AT BECCLES.

THIS house was recently erected upon the Grange Estate, from the designs of Mr. ARTHUR PELLS, F.S.I., architect and surveyor, Beccles, and contains three reception-rooms, eight bedrooms, dressing-room and bath-room. The brickwork is of red bricks laid in blue mortar, the roofs being covered with Broseley tiles.

ST. THOMAS'S CHURCH, TELFORD PARK, STREATHAM.

THIS church is proposed to be erected in Telford Park, for Archdeacon GIBBS, and some time ago a limited number of architects were invited to submit designs; but at present a commencement has not been made, as the committee do not feel justified in making a start with the funds they have in hand. The interior we illustrate to-day was that submitted by Mr. SPENCER W. GRANT, A.R.I.B.A., of 63 Finsbury Pavement, E.C., and Mr. SIDNEY R. J. SMITH, A.R.I.B.A., of York Buildings, Adelphi, whose design was selected. The church will consist of nave, transepts, aisles, chancel and baptistery and two vestries, and will be built externally of red brick and Bath stone, while the interior will consist of yellow malm bricks for facing, with Bath stone dressings and red Mansfield stone columns. Accommodation will be provided for 800 worshippers, the estimated cost without tower being 6,650*l.*

RESIDENCE, WAKE GREEN ROAD, MOSELEY, BIRMINGHAM.

THIS residence was recently erected for Mr. W. PERCY HARRISON by Mr. B. WHITEHOUSE, contractor, of Birmingham. The elevations are executed with red bricks and stone dressings, Bracknell rubber bricks being employed for the carved portions. The roofs are covered with brindled tiles. Messrs. ESSEX & NICOL, of Birmingham, were the architects.

BIRKENHEAD CORPORATION AND THE LOCAL ART SCHOOL.

A SPECIAL sub-committee of the Finance Committee of the Birkenhead Corporation have reported with regard to the transfer of the Birkenhead Schools of Science and Art to the Town Council. The report states that at an interview between members of the sub-committee and representatives of the School of Art, the matter was fully discussed, and the trustees were agreeable to the transfer, subject to certain conditions, among others:—(1) The trusts and provisions of the original trust-deed of 1871 to be observed and adhered to as far as possible, and especially as regards the maintenance and continuance of the principal building as a school of science and art; the property not to be sold except with the object of removing the school to some other site; neither the school nor its management to be handed over to the Department of Science and Art; (2) the title of the school to be enlarged so as to embody the name of the donor; it was also suggested that the school should be called "The Laird School of Science and Art"; (3) the committee of management to comprise some gentlemen not members of the Council, and when available a member of the family of the donor to be appointed on the committee; (4) the services of the present head master, who has been connected with the school since its formation, to be retained, at a fixed salary based on the average of his income from the science and art classes during the last ten years (say a salary of 566*l.* 16*s.* 11*d.*); suitable assistant masters to be provided; subordinate servants of long service to be retained; (5) the present trustees to be formally released by deed reciting the origin of the school; (6) all necessary legal and other expenses of and in connection with the transfer of the schools and the release of the trustees to be paid and borne by the Corporation. The land, buildings and furnishings to be handed over to the Council are valued at 7,966*l.*, and the invested stocks at 1,240*l.* In regard to these funds the trustees suggest that the present trust fund of 600*l.*, which is invested in a Birkenhead bond, should either be put on one side with the object of starting a museum or picture gallery, or remain invested and the interest applied annually to purchasing and adding to the present stock of examples, models, &c., or as a further alternative, appropriated in providing a prize fund. The present cost of carrying on the two schools amounts to about 1,000*l.* a year, but subscriptions, fees, &c., had nearly caused the accounts to balance. If the schools were transferred as proposed, subscriptions, &c., would cease, and the Council would have to find money to carry on the schools. For the year 1891 2,100*l.* had been received for technical education purposes, and it is suggested that for the present the Council retain this money. In concluding the report the sub-committee recommend, "That the Council should take over the existing Birkenhead School of Science and Art, together with its branch at Tranmere, and that all the necessary legal and other steps should be taken to effect such transfer; and that for the present and until some reliable estimate can be formed of the cost of carrying on the School of Science and Art, together with its branch at Tranmere, under the management of the Council or of the mixed Committee of Management to be hereafter established, it is inexpedient to make grants of money to any schools and institutions in the borough which have already made, or may hereafter make, application for aid." The Finance Committee will recommend the Council to approve and adopt the suggestions contained in the report.

MANCHESTER ARCHITECTS.

AN article in the *Manchester Guardian* lately contrasted the state of architecture in London, as shown by street improvements, with the neglect of the art in Liverpool and Manchester. The following questions were asked by the writer:—1. Why has there been no corresponding improvement in Manchester and Liverpool? 2. Is it that Manchester and Liverpool architects do not know what has been and is being done in London? 3. Or is it that they do not regard it as worth attending to? 4. Or, finally, is it the fault of the public, which will not have new ideas?

A "Manchester Architect" in reply says:—Are not the architects very much what the public make them? As Mrs. Poyser said when women were complained of—"They were made to match the men." It may, perhaps, be worth while roughly to classify or group the architects. Some few have powers of design, knowledge of architecture, ability in construction, the skill that comes from long experience, the taste that comes of natural cultivation of a natural gift, delight in the practice of their art; and these are men who would work at architecture for the work's sake. In others some of these qualities are altogether wanting, and those that remain are tempered by the conviction that to get work is of the first importance, and this damps all enthusiasm for architecture as an art. By a third group architecture is treated as a trade. To get work is the first thing, and to get paid for it is the highest good. There are some architects who have been carefully trained and taught, and who have studied their art at home and abroad. But there are others who have passed their three or four years' apprenticeship in a second or third-rate office, and who have very little general knowledge and almost no culture. There are others, again, such as builders' foremen, or clerks of works, or builders retired from business, or (as Lord Beaconsfield said) from whom business has retired, or office-boys promoted, who have picked up, as they think, the trick of how it is done, who pose as "practical" men, and who often get, from an ignorant and uncultivated public, no inconsiderable amount of work. Again, some buildings owe their conception to architectural pupils or assistants having the acquaintance of builders who have got "jobs" and want them put on paper. The architects of Manchester and Liverpool who properly deserve the title do know what is going on in London and elsewhere. That knowledge, however, nor even consummate knowledge of their art, does not necessarily bring them work to do. But the larger number of those referred to above, who write "architect" or "architect and surveyor" on their doors, probably do not keep themselves well informed of what is being done in London and elsewhere. So, in reply to question 3, those who do not know what is done elsewhere for the most part also do not care. But why should they care? If they are entrusted with buildings to carry out they are unlikely to believe that their offices would be fuller of clerks or their pockets of money if they spent their holidays in seeing what their abler and more cultured brethren have done in this generation or in past time. The answer to the fourth question is the simplest, and may well be the most emphatic. The chief reason why the architecture of Manchester has not improved is that the public are so little able to discriminate between what is really good and what is inferior or bad that the best and ablest architects are not duly encouraged. In the eyes of many persons a mass of stonework is a "handsome" building, even

though it be also a mass of crudities. Some, again, see beauty in fantastic abortions which have been happily named "acrobatic architecture." But commonplace people, to whom commonplace buildings appeal most, are so vastly in the majority that commonplace architects (and worse) have a wide pasture whereon to graze. Many buildings of the warehouse, office and shop class are got up by architects more or less as speculations. Some (so-called) architects spend most of their time and the best of their energies in getting hold of work to do. They watch sites, or they get sites into their own hands in such a way that it is difficult for anyone to build on the land in question unless this man is employed. He may be an architect of a low or of the lowest grade, but the situation may be to the client of more importance than the building. Much miserable building of poverty-stricken design is to be accounted for in this way. Unless it happens that an able professional assessor is appointed, it is most often the case that in architectural competitions the best design does not stand the best chance of being adopted. Very few committees or other such bodies have the necessary knowledge, taste and judgment to enable them to choose the best. It not unfrequently happens, particularly in this district, that the more a man knows the less chance he has of a design embodying his knowledge being adopted. The assumption of superior knowledge which such a design implies is in a way resented by the not well-informed judges. It is believed that many appointments of architects to buildings about to be erected are made in consequence of direct or indirect commissions paid to those who influence the appointment. If this be so, other considerations than proved ability or special qualifications on the part of the architect will prevail. Another cause—but this is chiefly in house-building—is the offers made by tradesmen of the class of decorators and others "to save" gentlemen—and still more ladies—"all trouble" by designing and building the house and furnishing it "all complete." Even an ironmonger in a large way of business told me he had an order for a large and costly house for a customer, and that he had undertaken to design and build and furnish it complete for habitation at his own price. At the very best such houses look like manufacturers' architecture. They exhibit ignorance of architectural style, inconvenience of plan and arrangement, and, though apt to be overloaded with ornament, possess no inherent right to rank at all as architecture. Many of these reasons brought forward to account for the poverty of design and the want of improvement in architecture are no doubt of equal force elsewhere. But in the comparison between Manchester and London it has to be remembered that a very large part of what is now called London is residential, while no part of Manchester proper can be so called, and in the immediate suburbs in or out of the borough there are very few new houses excepting those run up as building speculations, and the name of these is legion. To quote again from the article in the "Edinburgh" to which you refer:—"This is architecture built purely for the sake of percentage returns, nor can there be any change for the better until the public learn to recognise and to demand good architecture in our streets as something worth having and waiting for."

WINTOUN HOUSE.*

WINTOUN HOUSE is situated about twelve miles eastwards from Edinburgh, and about one mile from Pencaitland. The long unbroken southern front of the building stands on the edge of a steep bank, sloping down to the valley of the river Tyne; on all other sides the surrounding ground is level, and laid out as parks and policies. During this century extensive additions have been made to the house along the north and west sides. Fortunately these additions are not high, as otherwise the best parts of one of our finest seventeenth-century mansions would have been blotted out, as it is on the north front that the architect of the house has exerted his utmost skill. The south front is very plain, the reason of this being that the existing house is an enlargement of an earlier building which was a comparatively plain structure. At a later time the north and east fronts, and parts of the west front, were enriched and added to; while the south front, although heightened, was otherwise left in very much its original condition. The evidence of the staircase towers and the ornamental windows and chimney stacks of the north and east fronts being insertions and additions to an existing house is very obvious.

The late Mr. David Rhind, architect, in the "Transactions of the Architectural Institute of Scotland," 1851-52, expresses an opinion that the house stood unfinished for some time at the height of two storeys, and that when it was resumed it was continued in a more elaborate manner. Whether the view be adopted of the house having stood unfinished, or having been finished and afterwards altered, the fact of a change of style equally remains. The main portion of the house is an oblong, measuring about 79 feet long from east to west by about 31 feet in width, with a wing at the north-east corner about 25 feet square, having a turret staircase in the re-entering angle. These portions appear to have formed the original house, which was thus constructed on the old L plan. In connection with the later extensions there was added, at the north-west angle, a large staircase tower about 17 feet square, thus converting the plan into a shape similar to that of Castle Stewart and Pitreavie. The staircase in this tower ceases at the first floor level, and is continued in an angle turret, the tower itself becoming available for bedrooms. The wall of the south front extended westwards of the west gable. The building is three storeys high towards the north, but owing to the slope of the ground to the south an additional basement storey is gained in the main block, in which are situated the kitchen and offices entering from the south and communicating with the first floor by a private stair.

The principal entrance doorway was probably in the large staircase tower of the north-west angle. The staircase led on the first floor into the present drawing-room, which was then the hall. The room to the east of this, now called King Charles's room (which has access by a separate staircase) was probably the drawing-room, and the room to the north of it the owner's private room. The upper floors consist of bedrooms entering off a passage or corridor running along the north side. These have been modernised, but the old panelled plaster ceilings are in many cases preserved. Most of the interior, with the exception of the drawing-room and King Charles's room, has also been modernised. The interior of these apartments, with their fine plaster ceilings and ornamental fireplaces, are characteristic of the time of James I. It is interesting to note that the ornaments used in the plasterwork of Wintoun are identical in many instances with those of Pinkie House and Moray House. This indicates that the same plasterers were in all probability employed on all these houses, and that then, as now, it was found much easier and cheaper to copy the enrichments already made than to design new ones. In the drawing-room fireplace the figure-subjects on the inner panels are of wood and modern, the whole space having originally been an open fireplace.

From Maitland's "History of the House of Seyton," we find that Wintoun was built by George, tenth Lord Seton and third Earl of Wintoun:—"He built the house of Wintone (being burnt by the English of old and the policy thereof destroyed) in anno 1620. He founded and built the great house from the foundation, with all the large stone dykes about the precinct, part, orchard, and gardens thereof." According to Nisbet, he was the second Earl of Wintoun, and died in 1650; while David Laing styles him the sixth Earl.

In the "Transactions of the Architectural Institute of Scotland," 1851-52, the late David Laing has stated that, whilst examining various records, he accidentally met with a notice which seemed to leave no doubt that Wintoun House was designed and built by William Wallace, who then held the office of King's Master Mason for Scotland. Wallace was the first builder of Heriot's Hospital, and, in Mr. Laing's opinion, architect as well. Dr. Balcanquall, Dean of Rochester, who was executor to George Heriot, has been put forward as having been the architect of the hospital, which claim Mr. Laing disproves, and goes on to say:—"The house of Wintoun, in the parish of Tranent, may have contributed, through the recommendation of Mr. Robert Balcanquall, then minister of that parish, to his brother Dr. Balcanquall, along with his established character, and the personal knowledge of his fellow-citizens in Edinburgh, to his being employed in the erection of the new hospital." The hospital was begun in 1628.

Wallace, of whom only a few facts have been gleaned by Dr. Laing, was admitted a burgess of Edinburgh in 1621. He was deacon of the Freemasons' Lodge there, and was employed for repairs on Edinburgh Castle and Holyrood Palace, and for "his guid, trew and thankfull service" done there, he was appointed Master Mason to the King in 1617. He died unexpectedly in October 1631.

The following seems to be the notice which Dr. Laing founds his conclusion on as to Wallace having designed Wintoun House. It is from the "Register of Confirmed Testaments," December 12, 1632, regarding an allowance granted to him for special services to the Earl of Wintoun:—"Item: Thair was awin to the said umquhill William Wallace be George Earle of Wintoun, in acknowledgement of his panes in his lordship's works, conforme to his lordship's tiket, subscrivit with his hand, the sowme of 500 merkis, quhilk sowme of 500 merkis is upliftit sen the Defunctis deceas be Nicoll Adwart, baillie, and as yit is in his handis and custodie. Item: Be his Majistie's Thesaurer for the Defunctis fees as Master Massone to his Majistie, and for his leveray clothes due, to be pait be his Majisties Thesaurer ond Ressareris, the last of October 1631, 330 merkis."

While the above does not prove Wallace to have been the

* A paper by Mr. Thomas Ross, published in the *Transactions of the Edinburgh Architectural Association.*

designer of Wintoun House, it may be held as conclusive evidence that he was either the architect or the builder, and from the date we see that it must have been in connection with the enlarging and enriching of the house, to which we have already referred, that he was employed. That he was a man skilled in architecture may be inferred from what we know about him in connection with Heriot's Hospital. Thus his receipt to the treasurer in August 1629, for 100*l.* awarded to him by order of the Governors, bears that it was "for my *bygone panes and extraordinarie service in the Frame* and building of the said Hospitall this year bygone."

And again his widow, in an application to the Governors for relief after her husband's death, "being left with ane great burding of many young small babies," says:—"It is not unknown to your lordships what extraordinair pains and cair my said umquhile spouse had and tuik upon the said wark thir diverse years bygone, and at the beginning thairof." This was acknowledged by the Governors, who gave her 200 merks, "with the soume contenit in hir compt, and to ressave frae hir the haill muildis and drauchtis the said umquhile William haid in his handis."

All this seems to show that Wallace was something more than the builder of Heriot's—that he was, in short, the architect; and if his title to be so considered is clear in the case of such an important building, which Mr. Laing considered it to be, we may without hesitation assume that it was as the architect and builder of the ornamental part of Wintoun that the earl acknowledges Wallace's "panes on his lordship's warks."

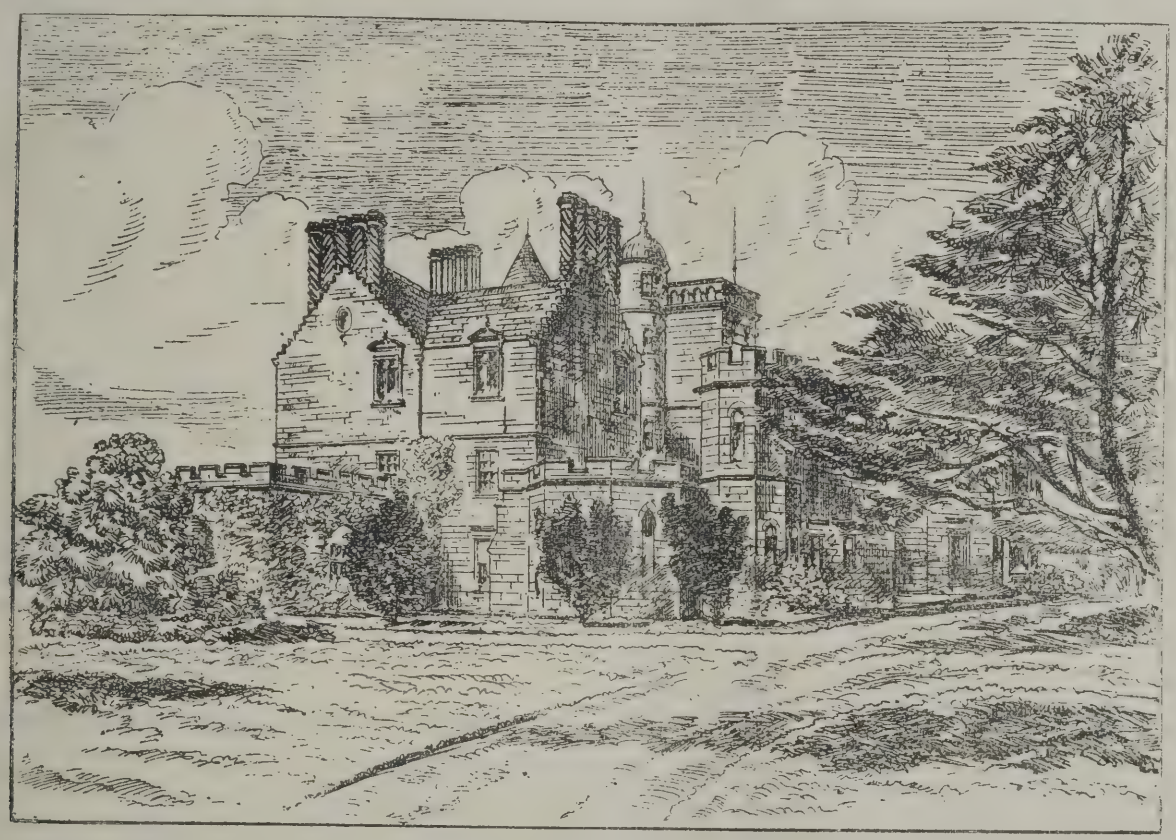
We may call attention to the manner of slating adopted in the curved roof of the "Wallace Tower," the slates being cut into patterns in a very unusual manner. There is a high terrace wall continued eastwards from the house, a few feet in advance of the south front, ornamented on the top with an open arcaded parapet, of the same design as that round the top of the "square tower," and otherwise the wall is ornamented on the face with coats of arms, &c. Stairs descend from the terrace to the lower grounds, and there are indications that the ornamental pleasure-grounds were at one time of considerable extent.

It is unfortunate that so little is known of Wallace, the architect, and where he studied his art, as a clue might thus have been obtained to the place whence the Scottish Renaissance chiefly came. Although the general character of Wintoun House is Scottish, there are many features in the design of this building (as well as in Heriot's Hospital) which forcibly recall the style adopted in England in the times of Elizabeth and James. The tall stone chimneys, ornamented with spirals and other enrichments, and the cornice and parapet of the square tower are strikingly English in feeling, while the octagonal angle turret and windows, with entablatures surmounted with interlacing scrollwork, have rather more of a Scottish character. Had this building stood alone, there is perhaps enough of English feeling in the design to justify its being attributed to an English architect. Hence, perhaps, the motive which has sometimes inclined people to assign this mansion, together with Heriot's Hospital, Drumlanrig, and every other building in Scotland in which the Renaissance style predominates over the Scottish, to Inigo Jones as a well-known and representative foreigner.

But when we examine other Scottish designs, and consider how the various features which are here met with in a completed form, were gradually and slowly introduced, we feel convinced that these features simply indicate the change of style which was then penetrating Scottish architecture, as the revival was affecting every other branch of human activity.

Many features of English architecture were introduced into Scotland about this period. Thus, at Leslie Castle, Kellie Castle and elsewhere, we have detached stone chimneys, set diagonally. At Moray House the detached chimneys are very tall, and stand on a pedestal, like those of Wintoun. At Craiginvar Castle, Fraser, Duntarvie, &c., instances occur of towers with flat roofs, provided with parapets and balustrades; at Innes House the chimneys are detached and the tower is square, and is covered with a parapet of unusual design; while at Heriot's Hospital a Renaissance style is introduced, in which few traces of the old Scottish remain, and which savours rather of Germany than of England.

The Rev. James Coullie, B.D., supplemented the above description in the following words:—



On the ceiling of the small dining-room there are the royal arms and the letters C. R. (Carolus Rex), and tradition has it that Charles I. on one occasion slept there. In the wall of the upper terrace is to be seen an elaborate stone panel containing the royal arms, and the words, "James I., King of Britain, France and Ireland." This panel is said to have been over the former entrance to the castle, and to have been placed in its present position for safety when the additions were made about the middle of last century. To the old house of Wintoun, Queen Mary is said to have been a frequent visitor. We remember that Mary Seton was one of the "four Maries." There used to be an old bedstead preserved in the attics called Queen Mary's bed. The estate of Wintoun was forfeited in 1715, when George, fifth and last Earl of Wintoun, was outlawed for his attachment to the house of Stuart. He was taken prisoner at Preston in Lancashire, tried for high treason, and sent to the Tower to await his execution. He effected his escape and fled to Italy. He died in Rome, aged 70. The York Buildings Company, a company formed for the purpose of buying up and again selling confiscated estates, bought Wintoun and sold it to Hamilton of Pencaitland. Thus the two adjoining properties became one, and Wintoun Castle the manor-house of the combined estates. Colonel Hamilton enlarged the house, adding to it the present large dining-room, ante drawing-room and front hall, changing the entrance from its former position near where the kitchen door now is. It was in his time that the present approach was made, and the high road thrown

back from the centre of the park to where it now runs. Traces of the old road are still to be seen near Pencaitland Cottage, and the trees in the field near old Wintoun toll-house mark its course. It was Lord and Lady Ruthven who built the present terraces, and abolished the old village of Wintoun, which stood in the centre of the park not far from the garden wall. It is said that Sir Walter Scott took Wintoun as his model for Ravenswood in the "Bride of Lammermoor." Not far from the west end of the present terraces there stood a mill. Traces may still be seen of the old mill lade by the side of the meadows. It was Colonel Hamilton who gave the Tyne its present straight course through the haugh between Wintoun and the bridge near the church. On the south side of the Tyne near the iron bridge, and where the clump of trees now stands, was the village of Pirnie. The Session Records speak of Pirn Castle, where some poor people lived, and the place is still known as the Pirnie Braes. At Loanfoot, where the keeper's house at present stands, there was once a group of houses, and away over near Wintoun Station stood the farm-steading of North Mains of Wintoun now absorbed in Wintoun Hill. A solitary tree in the middle of the field marks the site. There used to be near the church an interesting building known as the "College." Some say the name is taken from Colleague's house, and that it was, in fact, the old vicarage in which two priests lived. But all trace of it was swept away in 1856, when the churchyard was extended. The old part of the churchyard must be very old, but we have no tombstones with dates older than within thirty years of the beginning of the seventeenth century.

SANITARY ADMINISTRATION.

AT the meeting of the British Medical Association at Bournemouth an address on the evolution of local sanitary administration was delivered by Dr. Edward Seaton, lecturer on public health at St. Thomas's Hospital and medical officer of health for the administrative county of Surrey. After briefly sketching the rudimentary condition of sanitary administration before the passing of the Public Health Act in 1872, he described the effect of that Act in extending the sphere of medical and scientific influence in sanitary administration. That influence had been of incalculable advantage to the public health. Under the Act of 1872 certain large towns, notably in the North and in the Midlands, had appointed medical officers of health of a kind altogether different from the occasional sanitary referees who had preceded them. The health officers of the new creation were skilled advisers, whose chief function it was to exercise a continuous pressure on the authorities whom they served in all matters pertaining to the health of the community. The most important result of that influence was seen in the local Acts defining the conditions under which new buildings could be erected which had been obtained by several large towns between 1873 and 1878. These Acts not only improved the health of the towns to which they related, but led to the promulgation of the complete "Model By-laws of the Local Government Board," which were now being adopted throughout the country. With the view of giving effect to these regulations, some "pioneer" corporations had appointed a special building-surveyor, who should be responsible jointly with the medical officer of health for the enforcement of the by-laws. An illustration at once of the far-reaching effect of local legislation and of the influence of medical advice on local authorities was afforded by the notification of the Infectious Diseases Act, which was first introduced by the Town Council of Bolton, in Lancashire, in 1877. The great advantage of notification was that it enabled sanitary authorities to combat the actual, as well as the potential, causes of disease; for instance, by tracing an outbreak of infectious disease to a particular water supply. The public have not yet learned the lesson that different diseases require to be controlled by different methods. They are still under the dominion of what Carlyle would have called a "formula," to the effect that the cause of all disease is dirt, and that sanitary salvation is only to be found in well-flushed drains. The danger of this simple creed is that when the faith which has been pinned on cleanliness as an universal safeguard is shaken by the discovery that there are diseases which a system of drainage is powerless to prevent, sanitary science as a whole may be unjustly discredited, and runs the risk of being treated as the savage treats the fetish which has failed to produce the desired effect. The chief value of the notification of diseases is that it enables sanitary authorities, basing their action on medical and scientific knowledge, to wage war against the actual causes of the mischief in any given case (such as a water supply, a milk supply, a school, &c.), instead of wasting their energies in twirling the sanitary mop among potential causes. Notification is only a means to an end; and can only be useful when the immediate causes of the diseases notified are accurately known and amenable to control; but it could not produce any very remarkable results in checking the spread of such diseases unless it were complemented by the provision of an efficient sanitary staff and of adequate means of isolation in special hospitals together with disinfection. The former of these requirements was a matter of administrative policy which was hardly yet ripe for discussion. With regard to hospital accommodation for cases of infectious disease, the needs of a large town and the way in which they might be met were exemplified by the work of the Metropolitan Asylums Board. A sketch was given of the origin of that Board and of its development into a central authority for the hospitalisation of cases of infectious disease in London. The total provision made by the Metropolitan Asylums Board was not far short of one bed to every 1,000 of the population, which was the standard of requirement for public health purposes. The excellent example set by the Board in this respect had already been followed by several large towns, and before long no town of importance would be without the means of isolating cases of infectious disease. On the other hand, the Metropolitan Asylums Board had taken a lesson from sanitary authorities by throwing the isolation hospitals open to all patients, whether pauper or not, without payment. The position of the Board had, however, been greatly changed by the Local Government Act. The county councils formed by that Act were intended to be the chief sanitary authorities of counties in the future; they already had control of the lunatic asylums, and it would simplify sanitary administration if the control of the isolation hospitals were also relegated to them. A special reason for the transference of this responsibility in London from the Metropolitan Asylums Board to the County Council existed in the fact that the latter body had a responsible medical adviser of its own, while the former had to depend on casual and irresponsible counsel. On the whole, the Metropolitan Asylums Board, having done the work which it was created to do, had no longer any sufficient *raison d'être*. In county sanitary administration it would be advantageous if the county councils were immediately to undertake the functions of central sanitary authorities. As far as isolation hospitals were concerned, the present system was an administrative chaos. Owing to division of authority, hospitals with every provision for the isolation and treatment of infectious diseases might stand empty while epidemics were rising almost at their very doors, but outside the administrative districts to which they belonged. With regard to the future of sanitary administration, further evolution should be in the direction of greater simplicity in organisation and a nearer approach to uniformity in the size of sanitary districts and in the methods of administration than was now the case. The question of "whole service" must be considered in connection with that of the formation of administrative areas large enough to provide sufficient work and adequate remuneration for the medical officer of health. While deprecating cut-and-dry systems of administration and excessive centralisation, Dr. Seaton thought the present freedom of local authorities from all control was apt to degenerate into administrative license, with serious results to the community at large.

ST. GILES'S CATHEDRAL, EDINBURGH.

THE work of constructing the Chambers Memorial Chapel in St. Giles's Cathedral has now, says the *Scotsman*, reached an advanced stage in its completion. The chapel has been formed out of a building which was erected against the north-east side of the transept probably a short time after the Reformation. It has been used in the course of its history for a great variety of purposes—at one period, it is believed, as municipal offices—and had continued to be utilised as a sort of vestry down to the time when it was resolved to convert it into a chapel to the memory of the man who has done so much for St. Giles's. This building has now been opened up and thrown into the cathedral by a wide Gothic arch rising into the vaulting of the north aisle. The handsome groined stone ceiling—which the committee decided to introduce in order to adhere to the best traditions of the ancient edifice—springs from the four corners of the chapel and meets in the centre, with massive ribs, in a very fine ancient carved boss, belonging to some portion of the old church of St. Giles's, on which is represented the emblem of one of the evangelists. Corner columns with carved and moulded capitals in the style of the ancient work of St. Giles's support the ceiling. In the course of the construction of this chapel the removal of the plaster which covered the old east wall of the transept revealed some remains of moulded work, and their attention being drawn to it the committee decided to have a thorough examination made. They were rewarded by discovering the remains of a very fine Gothic window, sadly mutilated and broken certainly, but still sufficiently perfect to enable the architects to arrive at a fairly accurate idea of its original character. During the alterations at the beginning of this century the north transept was greatly changed. All the other walls were taken down with the exception of the one referred to, on which is now found the springing of the ribs of

the groined ceiling of the old transept. This, along with the window, is the only piece of ancient masonry now remaining in St. Giles's which has not been tooled over in modern times. The window is very much in the style of those at the east end of Melrose Abbey, being divided in the height with a transom supported on cusped arches, and having small battlemented ornaments along the top, after the style of the Perpendicular Gothic. The jambs of the window have rich mouldings, with carved capitals at the springing of the arches. On the inside the window must have been one of excessive richness. On its two sides there are the mutilated remains of elaborate canopies, evidently intended to contain statues—a circumstance which has led to the supposition that an altar had previously stood beneath. No part of the tracery of the window was found, although diligent search was made; and the committee, after giving the matter careful consideration, came to the conclusion that the restoration should be after some decided Scottish example. That selected, as the most characteristic, was one of the windows of Dunkeld Cathedral, the tracery of which was found to harmonise admirably with the other details. In pursuing this work of restoration a little further there was discovered above the window, on the outside, the remains of the carved cornice that ran beneath the parapet. It was enriched at intervals with carved corbels, two of which in a very fine state of preservation were secured, and have now been built into the archway leading to the chapel from the aisle of the cathedral, where they can be well seen. A good many loose stones with carving were also found, one of the most interesting being a Norman capital. It is well known that there was a Norman porch at one time on the north side of the cathedral, unfortunately taken down about the end of last century. A careful drawing of it, however, which was made and can be found in Sir Daniel Wilson's book, reveals the fact that the capital found during the excavations clearly did not belong to this doorway. It is of quite a different, probably an earlier type, and furnishes conclusive evidence that a church stood on the site in the twelfth, or certainly early in the thirteenth century. Another find, it will be remembered, was the arm bone, which caused a good deal of controversy, and was for a time supposed to be the arm bone of St. Giles. The construction of the chapel has been the means of greatly improving the cathedral, what used to be an exceedingly dark part of the interior being now admirably lighted. The committee hope to be able in the course of a few months to complete the work they have so happily begun. It is proposed to introduce two stained-glass windows into the chapel—one of which will be to the memory of Dr. Chambers, the restorer of the cathedral—and a brass tablet setting forth the history of the renovation. The architects for the work are Messrs. M'Gibbon & Ross, Frederick Street, Edinburgh.

EXCAVATIONS AT AYR.

THE following description in connection with the excavation of the church of St. John the Baptist at Ayr is contributed to the *Scotsman* by a correspondent :—

At the instance of the Ayrshire and Wigtownshire Archæological Association, a series of excavations is at present being conducted in the immediate vicinity of the tower that in olden days formed part of the church of St. John the Baptist, the parish church of Ayr. As far back as 1726, or about that year, the walls of the church proper were demolished to build, or to complete the building of, the steeple of the Tolbooth, which, after standing for almost exactly a century, was itself removed to make way for the march of public improvement. Since that time the blowing sand, accumulations of rubbish and finally the greensward, have combined to shut out the ruins from sight; but now, by the labour of the excavators, the long-buried remains are being gradually exposed, and in a week or two at the furthest the archæologists will have the satisfaction of knowing exactly the site occupied by a building which, in its time, played no inconsequential part in the national history.

Happily, St. John's was perpetuated by Slezer; and his view, taken in 1693, was available as an index to the searchers. In proof of the accuracy of the engraving, the foundations were discovered on the very first attempt, and the excavators have since been rewarded by the finding of the floor of the church and by the unearthing of a stone coffin in an excellent state of preservation. Other remains, in the shape of carved stones, &c., have also been brought to light; and it is highly probable that when the ground comes to be thoroughly searched at a further distance from the walls of the church, even more interesting relics may be disinterred. The workmen employed in 1726 in demolishing the edifice have made a clean sweep of everything adjacent to the walls. The lid, for instance, had been removed from the stone coffin and the contents dissipated. Their vandalism stopped short there, however, to all appearances, and close by the workmen of to-day have come upon immense quantities of human remains. The dead do not seem, save in the solitary exception of the stone chest, to have been provided with coffins. In some instances they were buried with their faces downwards; in others lying on their side; in no case has a skeleton been found on its back. Of course the utmost care has been taken of these remains, and where it has been necessary to disturb them they have been reinterred as close by their original place of sepulchre as was possible. In one instance, the skeleton of a man was found lying beneath the foundation-wall. It is hardly conceivable that he could have been so "eirded" after St. John's was built; and the inference seems irresistible that he must have been buried about the close of the twelfth century. So far as can be ascertained, no interments have taken place in the churchyard since 1654—the year in which the existing old church of Ayr was built—and it is worth noting that not in one single instance has a decayed tooth been found. The burghers of the centuries between the twelfth and seventeenth do not, therefore, seem to have been cursed with toothache.

When St. John's was built there is no means of knowing. William the Lion made Ayr a royal burgh in 1198 or 1200. Eight or ten years previous he erected a castle on the banks of the river, and it was from this "novum castellum" that he dated the charter. St. John's may have been founded at the same time, if it was not, indeed, already in existence. In 1224, according to the chartularies of Paisley, the master of the school of Ayr acted in a cause as judicatory, on a mandate from the Pope; and it may be assumed that the kirk was in existence, and a well-recognised centre of ecclesiastical influence, at at least as early a date as the school. But it is not till 1233 that the church itself appears on record. In that year a dispute arose between the monks of Paisley and Gilbert, the son of Samuel of Renfrew, when an examination of witnesses took place in the parochial church of Ayr; and between that year and 1292 there are three ecclesiastical references to St. John's. In 1324 or 1325, William de Lyndesey built a chapel, which he dedicated to the Holy Trinity. Lyndesey was Chamberlain of Scotland during a long period of the reign of Robert I. One of his successors, David Levingston, was Keeper of the Privy Seal under James III. from February 1482-83 till 1488; and another, Andrew Lockhart, became Treasurer of Scotland in 1530. In addition to the rector—afterwards, when Ayr was established a prebend of Glasgow, the curate—there were a number of chaplains, who officiated at the different altars; and, according to the records of the burgh, there were several choristers or singing boys, with an organist at their head, who played on the organs, sang in the choir, and taught a singing school in the town. St. John's had four principal altars, dedicated respectively to the Holy Trinity, to the Holy Cross, to the Holy Blood, and to the Virgin Mary. Other altars were dedicated to St. Michael, to St. Nicholas, to St. Peter, and to St. Ninian; and the conveners of the trades of Ayr founded an altar in honour of St. Anna, St. Eloy, and other saints, the patrons of the different trades. James IV. made numerous offerings in St. John's; and when at Ayr, in September 1497, his treasurer gave twenty shillings to the priests to say "a trentale of masses of St. John" for the king.

The tower of the kirk, which still stands intact and entire, was growing grey ere the Auld Brig was thrown across the rushing river. It may have seen a century go by—and it must have seen half a century at least—ere King Haco sailed up the Firth of Clyde, in 1263, to be crushed by the Scots on the shore of Largs. It looked across a few hundred yards to the castle of Ayr, where the flag of England flew, when as yet the spirit of Sir William Wallace had only begun to move in the camp of the people. Its walls must have reflected the glare that shone in the night sky when the patriot fired the barns and consumed the English soldiery in the fierce hecatomb. From the summit of the tower the friars may have watched the English army of revenge storm the castle, and, after holding it for a few months, effect their escape in haste when Wallace had swept the remainder of the westland clear of the enemy. Robert the Bruce came to the castle and set fire to it, in pursuance of his policy to leave no vantage ground for the Southrons; but the flames died out, and when the changing fortunes brought back the English, Ralph de Morthemer found refuge in it, and held it till Bannockburn had been fought and won. Sabbath, April 26, 1315, was a day of days in St. John's. Across the sandy knowes and from the causewayed streets of the town of Ayr marched a goodly gathering of nobles and of barons who had fought at Bannockburn, and with high pomp and ceremony they met in the church, declared their allegiance to Robert the Bruce in Parliament assembled, and decreed that, in the event of the king dying without male issue, his brother Edward should succeed him. A notable spot for such a scene; for, to the south, and beneath the ken of the tower, lie the broad lands of Carrick, of which the Bruce was Earl. Twice more, however, the friars saw the English soldiery come and go; and then there ensued a long period of comparative quiet. In 1533 the doctrines of the Reformation found militant adherents in Ayrshire, and one of these, Walter Stewart, brother to the lord of Ochiltree, gave practical demon-

stration of his zeal by casting down to the floor one of the images of St. John's. For this act he was called to account by the Bishop of Glasgow, who, after long dealings with him, persuaded him to recant his faith. But neither his recantation nor his life was of long continuance. On his way home he fell from the back of his horse into a stream and was drowned; but before the waters finally swept him away he exhorted his friends to take warning by his impending fate, protested he was there to die in the new faith, and that, sorry for his recantation in presence of the bishop, he was assured of the mercy of God in Christ. Finally, he bade them remember this judgment on him to their profit, and then letting go the stone to which he was clinging, he was drowned. The Reformation came on all the same, though the friars no doubt regarded Stewart's fate in the light of a judgment. The old Catholic fathers fled the scene, and the Presbyterians laid hold of the parish kirk and made it their own. Knox came to the westland and roused and quickened the reforming zeal of the burghers from the pulpit of St. John's; and later on, in 1602, and from that till 1605, when he was driven out, the minister was Knox's famous son-in-law, John Welsh. Then the Bishops had their turn, and then again the Presbyterians, till Oliver Cromwell appeared and turned the church into a shelter for his troops. By way of compensation, he gave the burghers a thousand merks Scots; and with this donation they built another kirk in the Friars' Yards, on the banks of the river Ayr. Around St. John's, Cromwell built a fort, and the greater part of it remains till this day.

In the archives of the town of Ayr is preserved the Obit Book of the church of St. John, the only MS. remain of the building. It is beautifully written in black letter on vellum, and consists of twenty-four leaves quarto, strongly bound together. The entries commence in 1306, the year in which Robert the Bruce assumed the sovereignty of Scotland, and close in 1595, thirty-five years after the Reformation of 1560, a fact which seems to indicate that the professors of the old faith were permitted to continue to some extent in the exercise of their offices. The testators whose obits are recorded in this interesting volume took care that the priests should not neglect their duty. Sir Andrew M'Cormyll, vicar of Stratone, "who died the 3rd day of the month of April, the year of our Lord 1507," enacted, "From those absent from these obsequies, and those absent from the whole mass, fourpence to be withdrawn; to the absentees from both, nothing shall be given. And that six priests at least be present at the obsequies after this mode; and because that delay brings danger, I wish that threepence be withdrawn from each present and not performing on the day of the obit." There are many similar reservations. And the same spirit seems to have obtained in the magistracy of the borough, who enacted in 1543, "And in likewise commands and charges all others, the chaplains having chaplainries within the parish kirk of Ayr, to persevere in their good and thankful service to the honour of God, and behave them thankfully for the good and common weal of the town, certifying them, an they be overtaken with any high displeasure against the good town, their benefice shall be taken from them and disponit to another more qualified therefor."

From the days of the Commonwealth St. John's has had no history. The tower was long used by the burgesses in order to watch their incoming and outgoing ships; but, as has been said, church, graveyard and all have disappeared, and remained perdu until the nineteenth-century daylight was let in upon them by the spades of the excavators.

CONSTRUCTION OF THE MANCHESTER SHIP CANAL.

At the annual meeting of the Institution of Mechanical Engineers of Liverpool, Mr. E. Leader Williams read a paper on "The Mechanical Appliances Employed in the Construction of the Manchester Ship Canal." He said that the mechanical appliances used in its construction were on the largest scale in order to minimise the employment of labour. The number of men and boys employed on the canal had never exceeded 17,000, and about 200 horses had been used. As the excavation amounted to 46½ million cubic yards, of which over ten millions were sandstone rock, any available number of men and horses would be insufficient to do the work in any reasonable time. Ninety-seven steam excavators and eight steam dredgers of large power had, therefore, been employed. The soil excavated had in most cases to be taken several miles to the spoil grounds, the position of which had necessarily been selected where land was moderate in price. For this work, and for the general purpose of construction, 173 locomotives and 6,300 trucks and waggons had been used. A railway had been laid along the whole course of the canal, in many places on both sides, with numerous sidings. These lines, with those laid in the bed of the canal for excavating purposes, amounted to a length of 228 miles of single lines. Flat-bottomed steel rails, 56 lbs. to the yard, with fish joints, were laid on ordinary cross-timber sleepers, and the cost was about 630*l.* per mile of single line. The railway and its rolling-stock were on a larger scale than some of the passenger and goods lines worked in this country or on the continent. The rate of excavation had varied from three-quarters of a million to one and a quarter million cubic yards per month. As the work proceeded and the cuttings became deeper and the inclines steeper, and as the sandstone rock required blasting before the excavators could remove it, the rate of excavation in the bottom of the canal was slower. The waggons are hauled out of the bottom of the cuttings by locomotive power, the gradients adopted being generally 1 in 30. Steam cranes were largely used in rock cuttings and for setting the masonry. There were employed on the works 124 steam cranes, 192 portable and other steam engines, and 212 steam pumps of various sizes, some being large Cornish pumps that had been brought from the Severn Tunnel works. The plant used consumed about 10,000 tons of coal per month. The greater part of the plant was specially constructed for the work, and the remainder was principally brought from Mr. Walker's contracts at the Severn Tunnel and Preston and Barry Dock works. The total cost amounted to 943,610*l.* The whole plant, huts, &c., were the property of the Ship Canal Company. No less than fifty-eight of the Ruston and Proctor's steam navvies were used, that being the largest number ever employed on any work. Its power in removing hard material was greater than that of any other machine yet constructed. Soft sandstone rock was removed by it without blasting. The buckets for the sand excavation on the canal had been increased in size to hold 2¼ cubic yards, so that two buckets were sufficient to fill a large earth-waggon holding 4½ cubic yards. The advantage of this excavator being self-propelled was considerable, but its weight was great, and on very soft ground it required heavy timbers under the rails. It should be put to work if possible with a high feed, 12 feet to 15 feet, according to the nature of the soil. It would clear its own road, and also that required for the line of earth-waggons. The cost was about 1,200*l.*, and with this machine about 2,000 cubic yards had been excavated in one day of ten hours in good material. A fair average, however, would be 600 to 700 cubic yards. The working expenses of a steam navvy may be put at about 30*s.* per day. Its disadvantages are that its capability is limited to cutting its way forwards only, and that its great weight has sometimes caused its disuse on the canal works where the ground has been very soft; no ordinary system of rails and sleepers is sufficient to carry the navvy on very soft ground. The fact that these steam navvies could work in hard material was a great advantage, and they had been used in cuttings where no other excavating machine would work. The Wilson steam excavator was of the same type as the Ruston, and had done good work on the canal, its average being about 600 cubic yards per day of ten hours. The cost was about 1,050*l.*, and the working expenses 25*s.* per day. The Priestman and other grabs had been used, principally for excavating foundations and other similar work; in suitable soil it had been found to work up to an average of 300 cubic yards per day of ten hours. Four excavators constructed by Messrs. J. Boulot & Co., of Paris, had been employed, and three somewhat similar ones made at Lubeck, the latter being known as the "German," the former as the "Frenchman," excavators. The seven machines were of the bucket ladder kind, and were, indeed, land-dredgers. The first cost of the French dredger was about 2,400*l.*, and under favourable circumstances it was competent to remove a great amount of material. The best day's performances recorded in its favour are as follows:—Section No. 3, 1,943 cubic yards; No. 5, 1,624; No. 7, 2,250; No. 8, 2,025 cubic yards. These are remarkable figures, but the soil and other circumstances must be suitable in order to afford such results. The average day's work on all the districts is about 1,500 cubic yards. If 440 waggons, containing 1,650 cubic yards, were filled per day on section No. 8 by the "Frenchman" it was considered a fair day's work. A bonus of a penny per cubic yard was paid to the men on everything above this quantity. For the excavation of this quantity of material the average daily expenses of the machine in coal, stores and repairs, the last item being heavy, were about 60*s.* per day, or 0·48*d.* per cubic yard excavated. There were employed upon the excavator an engine-driver and a stoker, and round it a number of men varying from 28 to 43, the average number being 35; the roads required frequent moving. The land dredger, known as the "German," is made by the Lubecker Maschinenbau-Gesellschaft, Lubeck. The differences between the German and the Frenchman are slight. The best day's performances on the different sections of the canal are as follow:—Section No. 3, 2,073 cubic yards; No. 4, 1,736; No. 5, 1,725; and No. 6, 2,400 cubic yards. The average day's work is 1,416 cubic yards, with an average number of 36 men. It weighs about 70 tons, being a lighter machine than the Frenchman, and generally less substantially built; its first cost is the same, namely, about 2,400*l.* The heavily-timbered roads required for working the German and French land-dredging excavators

increased the cost of working; and as the first cost of these machines is heavy, the cost of excavation does not fall much below the rate of steam navvies, which may be taken in average soils to be 2*d.* per cubic yard, while that of the grabs may be taken at 3*d.*, and that of the land-dredging excavators at 1½*d.* per cubic yard. One peculiarity of the excavation has been the employment of a large number of side-tip waggons, capable of holding 4½ cubic yards each.

Summarising the results of experience in the working of land dredgers in England, it may be said that in light material and on level ground they will fill waggons at considerable speed and with economy; and where large excavations of soft material have to be made with rapidity the bucket-dredging system gives the cheapest and best results. But they will not excavate heavy or strong material; they are difficult and expensive to maintain, and therefore cause delay to the work; they require a costly and a heavy road, and special precautions on soft ground to prevent them from tilting over into the cutting, and they are expensive to move from one cutting to another. The Ship Canal Company also own four powerful steam dredgers. The Manchester is a hopper dredger, built by Messrs. W. Simons & Co., of Renfrew, and has double screws at each end of the vessel so that it can steam either way, thus avoiding the necessity of turning in the canal. It can dredge 800 tons per hour in favourable material. The Mersey and Irwell dredgers were built by Messrs. Fleming & Ferguson, of Paisley, in the bed of the canal between Manchester and Warrington. They each dredge 400 tons per hour into hopper barges. The Barry dredger also delivers into hopper barges. There are also working on the canal three other large dredgers hired from Preston, Ayr, Dumbarton and the Weaver Navigation, besides smaller dredgers, grabs, &c., worked on barges.

At Ellesmere Port there is an embankment faced with stone one mile long across an enlargement of the estuary. On each side of the foot of this embankment close timber-piling is driven, consisting of piles 13 to 14 inches square and 35 feet long. Over 13,000 of these piles have been driven through sand without any trouble by the use of the water-jet principle. Four steam pumps were used, which delivered the water at a pressure of about 30 lbs. per square inch through 2-inch indiarubber pipes to the pile, where it was attached to a 1½-inch wrought-iron pipe, which was put down under water-pressure alongside the pile. With this assistance the steam pile-engines quickly drove the pile, which, without the disturbance caused by the waterjets in the sand, could not be driven. Steam pile-engines are employed on various sections of the work.

ABERDEEN IMPROVEMENTS.

ACCORDING to the *Aberdeen Daily Press*, the Improvements Committee of the Town Council have approved of a scheme for the extension of Marischal College. It is proposed to acquire the whole of the property in front of the college, on the east side of Broad Street, from Littlejohn Street on the north to within 80 feet of Queen Street on the south, absorbing the upper half of Longacre. It is further proposed to acquire, on the north side of the college, the whole of the property on the south side of Littlejohn Street for a distance of nearly 300 feet from the Gallowgate—fully half-way down towards West North Street; and on the south side of the college it is proposed to acquire the property lying within a line drawn eastwards from the point already indicated (about 80 feet from Queen Street) towards West North Street for a distance of about 440 feet. The boundary line of the University on the north, west and south sides would then run along Littlejohn Street, from a point fully half-way down, to Broad Street; then along Broad Street to within 80 feet of Queen Street, thence eastwards for a distance of about 440 feet. So far as new buildings are concerned, it is intended that the addition to be made to the south wing of the college should consist of a building 130 feet long by 60 feet wide, to be erected as a continuation of the present south wing, but on the site of Longacre. The south wall of the present wing would thus form the north wall of the new building. The additions proposed to be made to the north wing are of a more extensive character. They include the widening of the present north wing by 30 feet, making the total width of the wing 65 feet; also the elongation of the wing by the addition of a new building, 135 feet long by 60 feet wide. This building, like that proposed to be added on the south side, is retired from the line of the present wing, the north wall of the present wing forming, generally speaking, the south wall of the new portion of the block.

The removal of Greyfriars Church is also included in the scheme; the plans of the new buildings show the church converted, on the existing site, into a graduation hall. Provision is also made in the plans, however, for the Greyfriars congregation. It is proposed to erect the new Greyfriars Church in the south-west corner of the new ground of the college, and, as at present proposed, the new church will be 130 feet long by between 40 and 50 feet wide. The building is shown in the plans standing east and west, with the gable towards Broad Street, but the site will be one of especial prominence, since Broad Street is proposed to be greatly widened in front of the college, and the greater part of the north frontage of the church will face the widened portion. This widening of Broad Street is one of the main features of the scheme. The boundary of the college ground towards the street will be marked from the new Greyfriars Church to Littlejohn Street with a massive ornamental railing, two main entrance gates being provided practically on the site of the present entrance. It is proposed to set back this railing so as to add to Broad Street, between the points named, a piece of ground measuring 75 feet at the church and about 5 feet at Littlejohn Street. The Gallowgate, which at this end at present is only 20 feet wide, will then have a width of 40 feet from Littlejohn Street to Broad Street, and the last-named thoroughfare, from Gallowgate to the new church, will have an average width of between 80 and 90 feet. These are the alterations provided for in the plans as they stand, and, according to them, Gordon's Court of course disappears for ever from the scene, and Longacre is diverted into Queen Street. It may be noted that the suggestion is also made that abundant space for extensions could be secured by the purchase of properties between the college and Littlejohn Street on the north side, and between the college and Shoe Lane and Henderson's Court on the south. The cost of carrying this comprehensive scheme into effect is very considerable. It was reported to the meeting that Mr. Mackenzie, architect to the college authorities, estimates the cost of new works at 34,000*l.*, and of properties to be acquired 27,450*l.*—including 3,000*l.* for Greyfriars Church—a total of 61,450*l.* The acquiring of the properties for future extensions would involve an additional outlay of 11,000*l.* It was contended, on behalf of the college authorities, that the scheme would mean a very extensive city improvement, and on that account they asked that the Town Council should meet a proportion of the cost of acquiring the properties. They fix the proportion of the cost of acquiring properties to be borne by themselves at 13,650*l.*, and their proportion of the total cost at 47,650*l.*, leaving a proportion, amounting to 13,800*l.*, to be borne by the Town Council.

THE CORINTH CANAL.

A CORRESPONDEET of the *Evening Post* of New York gives the following description of the works now in progress for the canal across the Isthmus at Corinth:—

Here we were at the entrance of one of the most stupendous works of the nineteenth century or of any century. I looked upward and inward. The prism of the excavation is a little less than four miles long and perfectly straight. The ground rises rather abruptly at either end, and continues to rise gradually to a point about midway, where it is 260 feet above water level, *i.e.* 100 feet higher than Niagara Falls. The cut is to be carried 22 feet below water level, and the width at bottom is to be 86 feet. The slope of the bank is 60 deg., the material a calcareous tufa, having the appearance of an indurated clay, being perfectly secure at that inclination, and not washing perceptibly by rain.

Engineers will understand what is implied by a cut of this magnitude, but laymen can appreciate it only by standing at the base of the excavation and looking upward. I did not get the full effect as it will be eventually, because there is still about 60 feet vertically to be taken out; but the impression one receives when passing through the canal in its present state, and reflecting that this is all the work of man and not of the Cyclops, is quite overpowering. Looking inward, that is, towards the western end, the canal seemed to be filled with fog, and I supposed that there must be a mist driving in from the Gulf of Corinth. But this appearance was due to the dust caused by the workmen who were digging down the sides of the prism, standing on a series of steps extending from bottom to top. There was a shower of earth falling along a space of half a mile near the centre of the cut. This material was disposed of by steam dredgers, which lifted the loose earth in buckets on an endless chain, and deposited it in cars to be drawn by locomotives to the dumping grounds. This is the widening process.

The deepening process is quite different. For the latter a trench is first sunk, wide enough and long enough to receive a train of cars. At the end of the trench inward a tunnel is excavated to receive the train. From the top of the tunnel to the surface of the superincumbent ground, where the labourers stand, may be 20 or 25 feet vertically. Then shafts are sunk at regular intervals down to the tunnel, along the line of the railway track, and the earth is shovelled into these openings and finds its way with the least amount of manual labour into the cars. The openings gradually assume a funnel shape like mill hoppers extending the full width of the prism, and accordingly a person desiring to traverse the canal must skirt the perimeter of these hoppers at the risk of depositing his mortal clay

along with that of the Corinthian isthmus in the cars below. Experience had made Mr. Mavrocordato, the engineer in charge, an adept in this kind of spiral exercise. Nor did he seem to be at all disturbed by the blasting operations that were going on both overhead and under foot. My own nerves were somewhat shaken. My Turkish dragoman was the first to retire, which he did on a plea of sore eyes and affliction thereunto from the dust. With some help from the shovellers I surmounted eight of these funnels, all that were then in operation, and soon found myself on the Corinthian side of the cut. I knew that returning would be as tedious as go o'er, and so I found it, but there was no mishap and no great fatigue in either direction.

The material taken out is a calcareous tufa, but is not of uniform colour. It is firm enough *in situ* to require blasting, but the blasts are of low power, merely loosening, not shattering, the material. In one place only a wall of true limestone is encountered, a part of the backbone of Greece, but here it is only a few feet in thickness. Probably the material is of the kind that an engineer would choose for such work if he could have his choice, as it is not really refractory, and yet has no tendency to slide.

The present Corinth Canal—there was an old one begun by the Emperor Nero, A.D. 67, on exactly the same line—was initiated by a French company in 1882, the Comptoir d'Escompte being its financial agent. When the latter failed in consequence of the great copper speculation, the work on the canal stopped for want of funds. After an interval of two years it passed into the hands of a Greek company which has found the means for completing it. Twelve hundred men are now employed upon it. These are Armenians, Italians and Montenegrins. The wages paid is equal to sixty cents per day of our money. I saw them taking their midday meal. It consisted only of bread, water and a few olives. Mr. Mavrocordato tells me that the canal will be finished within three years, and that it will admit the largest merchant ships now in use in the Mediterranean, and will enable any two of them to pass at any point. Being a sea-level canal, it can be operated at the lowest cost.

ST. CHAD'S COLLEGE, DENSTONE.

THE dedication festival in connection with St. Chad's College, Denstone, and the celebration of the completion of the college buildings took place on Wednesday in last week. The foundation-stone of the new hall was laid in 1888. Following the ancient Benedictine models adopted by the founder of Lancing College for his school buildings, the hall is second only in importance to the chapel, which stands on the southern wing of the Selwyn quadrangle. The hall itself forms the northern side, and the large schoolroom, with its wings, is the connecting link between them. The structure is in two storeys, of which the hall proper forms the upper storey. The inside dimensions of the hall are 93 feet long by 35 feet wide, with a height of 18 feet to the cornice and 35 feet to the highest point of the wooden ceiling under the timbers. The hall is lighted on the south side by five three-light windows, and some smaller lights in the eastern gable. The exterior is in unison with the rest of the college buildings, and is in the Early Pointed style of architecture. The work has been carried out from the designs of Messrs. Carpenter & Ingelow by Mr. Bentley, of Waltham Abbey. With this addition the school buildings are practically complete. The cost of the work has been about 70,000*l.*, a sum which has been raised by public subscription, mainly owing to the efforts of the vice-provost, the Rev. H. Meynell.

CHURCH BUILDING AND RESTORATION.

Bingley.—The foundation-stone of a proposed new church for Harden, near Bingley, has been laid. Messrs. Healey Bros., of Bradford, are the architects. The church will be in the Early English style of architecture, with nave, chancel and north aisle. The total cost of the church is estimated at 2,050*l.*, and when erected it will seat about 250. The internal fittings will be of pitch pine, with open benches.

Halifax.—A new Primitive Methodist chapel and school in Queen's Road, erected in place of the old premises in Gibbet Street, have been opened. The new chapel and school are in the Gothic style, and on the one-floor system, there being no galleries. The chapel will seat 460 persons. The fittings are of pitch pine, except about the communion, where they are of mahogany. The school will accommodate 400 scholars, and there is a lecture-room, also sixteen classrooms. The expenditure is about 6,000*l.* Mr. J. Farrar, of Halifax, is the architect.

Peterston-super-Ely.—The pretty and ancient church of Peterston-super-Ely has been reopened after undergoing restoration and redecoration under the superintendence of Messrs. Kempson & Fowler, architects, Llandaff. New floors and steps have been laid, and a beautiful oak screen has been erected across the chancel arch. The new chancel seats are also in oak. The whole of the oak work and carving was executed by Mr. W. Clarke, of Llandaff. The plastering and wall decoration was executed from the architects' designs by Mr. Morgan, decorator, of Canton, Cardiff. The peal of six bells in the belfry have been recast and rehung.

SCHOOL BUILDINGS.

Hoylake.—The new Church of England day schools have just been opened at Hoylake. The schools, which are of red brick, stand at the far end of the village. There is accommodation for 500 scholars, and the total cost, exclusive of site, is 2,000*l.* Mr. T. Clarke, of Liverpool, is the architect.

Foleshill.—New Board schools are to be erected on a site in Brickkiln Lane. The buildings are planned to accommodate 400 children. The buildings will be of plain red brick, with moulded labels and dressings, and the roofs will be covered with best Broseley tiles. The plans have been prepared by Mr. T. F. Tickner, M.S.A., architect, of 7 Bishop Street, Coventry, under whose superintendence the work is to be carried out.

Barnstaple.—The memorial-stones of a school chapel, to be erected at Newport in connection with the Wesleyan body at Barnstaple, have been laid. The new premises are intended to seat 230 persons. The erection of the chapel proper, for which a site is reserved, is deferred for the present. Mr. A. Lauder is the architect, the builders being Messrs. Cooke & Hancock.

NEW BUILDINGS.

Bromsgrove.—A new cottage hospital has been opened at Bromsgrove by Earl Coventry. The hospital, which is built upon the pavilion system, has been erected from the designs of Messrs. Cotton & Bidlake, architects, Birmingham, by Messrs. Brazier & Son, contractors, Bromsgrove.

Hull.—The Victoria Children's Hospital, Park Street, has been opened. Plans submitted by the late Mr. B. Musgrave were adopted. The work has been carried out by Mr. W. H. Bingley, who, with the late Mr. Musgrave, prepared the plans. The building is of red brick, with dressings of the well-known Ancaster stone of the Lindley quarries. Messrs. George Jackson & Son, Hull, have been the contractors for the entire work, and Mr. J. Halcrow was engaged as clerk of the works. The sub-contractors have been Messrs. Dawber & Sons, slaters; Mr. G. Taylor, plumber; Mr. Watkin, painter; Messrs. Bradford & Co., Manchester, kitchen and laundry arrangements; and Messrs. King & Co., ironmongers.

GENERAL.

Mr. Andrew Murray, principal clerk in the City architect and surveyor's office of London, has been appointed City surveyor, at a salary of 1,000*l.* The office of City architect has been abolished.

A Stone Statuette of a bishop attired in full canonicals has been found in Kirk Entry, Dundee, while clearing out a drain. It is supposed to have occupied a place in St. Mary's Church in pre-Reformation times. The figure, which had been about 2½ feet in height, is skilfully carved.

Lord Mostyn has given a site and Lady Augusta Mostyn 1,000*l.* towards the erection of a new church at Llandudno.

A Faculty has been granted in the York Consistory Court for the erection of a new reredos in the church of St. Michael, Neepsend, Sheffield, according to plans by Messrs. Cotterill & Scholefield, architects, Victoria Chambers, London.

The "Standard" says the excavations which have been going on at the village of Triel, where James II. was supposed to have buried his crown and other treasures, have proceeded to such an extent that the municipal authorities have been compelled to interfere, as the safety of some of the buildings in the neighbourhood has been seriously endangered.

Mr. Herbert Riches, architect, has removed his offices from 59 and 60 Cornhill to No. 3 Crooked Lane, King William Street, E.C., in consequence of alterations to be made at the former premises.

Mr. John Douglas, architect, Chester, has prepared plans for a new church in Newtown, which is to be erected on the site of the existing building.

Mr. J. E. Wright, architect, has been placed on the bench of magistrates for Warrington.

The Chancellor of the Chester Consistory Court has granted a faculty to the vicar and wardens of Wybunbury parish church authorising them to take down the whole of the present church with the exception of the tower, and rebuild it partly on the present site and partly on the churchyard adjoining.

The Architect.

THE WEEK.

THE following papers were to be read at the meeting of the Society of Antiquaries, Ireland, which is being held this week at Killarney:—1. "The Island Monasteries of Wales and Ireland," by Rev. Professor STOKES. 2. "Celtic Art in Wales and Ireland Compared," by J. ROMILLY ALLEN. 3. "The Great Earl of Desmond," by Rev. DENIS MURPHY, S.J. 4. "The Voyages and Adventures of St. Brendon, the Navigator," by Rev. T. OLDEN, M.A. 5. "Ballynoe Stone Circle, co. Down, and a notice of the neglected condition of the supposed Grave of St. Patrick, at Downpatrick," by WILLIAM GRAY, vice-president. 6. "Description of an Ancient Celtic Shrine, *circa* A.D. 800, found in Lough Erne during the present year," by THOMAS PLUNKETT. 7. "The Ogam Cave of Dunloe, near Killarney," by the Right Rev. Dr. GRAVES, Bishop of Limerick. 8. "Notice of an Ancient Wooden Trap, probably used for catching Otters," by Rev. GEORGE R. BUICK, M.A. 9. "Two rare Stone Implements, found at Lough Gur, co. Limerick," will be exhibited and described by Rev. J. F. M. FFRENCH. 10. "Mor, Sister of St. David of Menevia," by Rev. DENIS O'DONOGHUE, P.P. 11. "Methods of Construction employed at Kilmalkeldar and the Oratory of Gallerus," by ARTHUR HILL, B.E.

WE hope the very numerous purchasers of membership tickets for the Congress of Hygiene and Demography will be convinced before the week ends that architects are not the authors of all the ills which afflict human bodies. If so the money will be well laid out. It is convenient to find one cause for effects and defects, and at a time when the old recipes no longer inspired confidence, it was easy to imagine that doctors and undertakers' bills were closely related to defective drains. Any one who heard or will read the address of Sir JOSEPH FAYRER on Preventive Medicine must be assured that there are many potent causes for high death-rates besides badly-arranged houses, although the latter may count for much. At present sanitarians are only fighting in the dark, for little is known about the causes of disease, and the efforts of physicians to deal with them may still be described in BULWER LYTTON'S words as "putting substances of which we know little into bodies of which we know less." In spite of all the researches of PASTEUR and others, the new microbe theory is as inadequate to solve all difficulties as the theory of drains. It may be assumed that in time there will be a theory of disease established which can be generally accepted. But it is never likely to be one which can dispense with the co-operation of many agents, and the Congresses of Hygiene not only give hope of such a theory as is desired, but they educate men to believe that so complex a result as public health is only to be attained by the efforts of all the inhabitants of a country. At the present time in England sanitary administration is not aided; in fact, in many parts the work of the officers is impeded, directly or indirectly. Until a change takes place, the progress of sanitation will be slow. If the congresses can aid in teaching all classes that they should regard themselves as parts of a great body, and that individual neglect leads to serious consequences, the meetings cannot take place too often in England.

AMONG the curiosities of architectural history which are not generally known is the part taken by the Empress EUGÉNIE in the competition for the Paris Opera House. The circumstances are as strange as any which have been recorded in connection with such contests. Her Majesty took great interest in the project for the new building, but it was not until almost the last moment that she was inspired with the ambition to contribute a design. As not uncommonly happens with the attempts of amateurs, the imperial design bore a resemblance to an existing building, the favoured one being the town-hall of Brescia, and the choice was creditable, for PALLADIO was an enthusiastic admirer of the edifice. But it was necessary to have the drawing worked up to competition pitch. First one of the draughtsmen attached to the Tuileries operated on it, then it was handed over to M. CHABROL to put in some finishing touches. But what amateur is satisfied with other people's endeavours to give definiteness to his beautiful, if hazy, conceptions? The Empress was annoyed, and the task of newly interpreting the sketch was confided to M. CHARLES GARNIER, whose fate was depending on the same competition. But the architect, as became a courtier, was a diplomatist, and at his suggestion the aid of M. LOUVET was invoked. At last the design appeared in a form that was considered presentable. Meantime the period assigned for the preparation of designs had passed with that celerity which is known to all competitors. The controller of the arrangements was fortunately the Count WALEWSKI, and the conditions were therefore set aside. The design was admitted, and the motto suggested its history, "Mieux vaut tard que jamais." But with all their loyalty to Imperialism, the judges could not help selecting M. GARNIER'S design. The Empress, in return for her exertions, has had experience of that hope deferred which is familiar to most competitors, and Count WALEWSKI was enriched by a drawing for which no parallel could be found, even if we go back to the days when SEMIRAMIS became her own architect.

ACCORDING to the *American Architect*, the trustees of the proposed cathedral of St. John the Divine for New York have decided to place the erection of the building in the hands of Messrs. HEINS & LA FARGE, the youngest and least experienced of the four competitors in the final competition. Fortunately youth and inexperience are not cardinal sins, but may even be, when united with natural ability and thorough acquired training, cardinal virtues. The choice, which for many reasons was the best that could be made under the circumstances, indicates one thing pretty clearly and it militates strongly against the ordinary practice of giving to the most successful and popular, and therefore the busiest, architect still further work to do. In the present case, starting with the assumption that the four competitors possessed equivalent capacities, the event has proved that the competitor whose attention was least distracted from the study of his problem by the imperative calls of a busy practice has carried off the prize. Messrs. HEINS & LA FARGE happened to be so situated that they could give undivided and sustained attention to their problem, the result being that their final drawings showed greater evidences of serious study and consequent improvement than did any of the others, and so seemed to give tokens of their intention and ability to still further better the work as it went on. Before the building is finished—perhaps even before it is begun—their youth and inexperience will have been cured.

IN spite of the rise of new watering-places, Brighton still retains its supremacy. From recent sales it is evident that high prices are obtainable for first-class houses. Mr. J. T. CHAPPELL has displayed exceptional enterprise in erecting residences that are adapted to the new conditions of Brighton. One of four just erected in King's Gardens, Hove, has been sold to Mr. JACOB SASSOON for 12,700*l.*, and a further sum of 2,000*l.* has been paid for the decorations. There is no doubt that the purchase, if considered as an investment merely, is a safe one, for, owing to the advantages possessed by Brighton, it is likely to be as much appreciated as it is deservedly at present.

THE subject assigned this year for the Prix de Rome in the Section of Architecture was a railway terminus. The following students were selected as competitors:—MM. CHAUSSEMICHE, pupil of M. ANDRÉ LALOUX; PATOUILLARD, pupil of M. GINAIN; RECOURA, pupil of M. PASCAL; EUSTACHE, pupil of M. GINAIN; HEUBÈS, pupil of M. PASCAL; BERTONE, pupil of M. GINAIN; DEPERTHES, pupil of MM. DEPERTHES and GINAIN; BELESTA, pupil of M. ANDRÉ LALOUX; NORMAND (PAUL), pupil of MM. NORMAND and ANDRÉ LALOUX; VARCOLLIER, pupil of MM. VARCOLLIER and GINAIN. The prize has fallen to M. EUSTACHE. The second prize was awarded to M. PAUL NORMAND, and the third to M. CHAUSSEMICHE, who was placed first among the competitors by the authorities of the School.

THE BERLIN EXHIBITION.—II.

THE American artists are aware that their countrymen are ubiquitous, and consequently they take advantage of as many continental exhibitions as are open to them. In Berlin they are more largely represented than English artists, and they compete with Germany itself in the number and excellence of illustrations for books. As American works are present, the absence of the French School does not cause the gap that was anticipated, for not only do most of the oil-paintings come from Paris, but they are likewise suggestive of French canons, and the works of the pupils are often worthy of the masters. Mr. Healy has so long resided in Paris—he obtained a Salon medal in 1840—as to make some people doubtful of his nationality. The only portrait by him that was obtainable is of M. Jules Simon, which comes from a public library in Chicago. Mr. F. A. Bridgman can express Algerian life as well as his master, M. Gérôme, without any sculpturesque hardness of outline, and he shows a more frank delight in the contrasts of light and shade. Mr. W. Gay studied under M. Bonnat, but his *Weberin*—a woman seated at an old-fashioned loom—might have come from one of Israels' pupils. Mr. Humphrey Moore is very successful with his *Moorish Dance*, and like some more artists, he has also turned the Japanese to account for subjects. Every year reveals additional power in Mr. Charles Sprague Pearce. His *Shepherdess*—a girl in grey leaning on a staff in a heathery field—is one of the works in the exhibition which give most delight. Composition, modelling and colour show the hand of a master who is not afraid to take up a subject that Millet was supposed to have monopolised for ever. Mr. Julius Stewart always surprises a spectator, and *On the Seine at Bougival* is one of his brilliant works in which nothing seems laboured. Mr. Edwin L. Weeks has done more to make India known in the West than any English artist. From their French training American painters find a pleasure that seems to be novel in watching the play of light, some in Africa, others in quiet parts of France, and even amidst the excitement of Paris. In spite of the prejudice against Indian subjects, Mr. Weeks has been successful, for whether in an outdoor scene like the *Restaurant, Lahore*, or the quietude of the *Pearl Mosque, Agra*, which seems built to be a refuge from heat, he is alike true to nature, and, however strong may be his colours, they are so graduated that they always give satisfaction. Mr. A. Bierstadt's works are welcome for their suggestion of space and magnitude, as the artist finds his subjects in America.

It is easy to see that in Belgium there is a growing tendency towards *genre*, under which may be classed landscape and portraits. There are some admirable historical works, and a few pictures would serve for churches, but, however highly they may be esteemed, it is evident that realistic theories are gradually convincing amateurs that it is better to depict human life as it is to be seen, although in humble scenes, and to repress imagination than to attempt subjects in which creative power is necessary. Evidence of the change in taste is visible in the pictures with which frequenters of exhibitions are acquainted. M. Slingeneyer's large *Last Day of Pompeii* may be considered as one of the earliest victims to the new ideas, for when produced the artist was warranted in supposing that it would become public property. Three phases of Mediævalism are brought before us in M. Van Hove's, *Alchemy, Witchcraft and Scholasticism*, a small work which, at first sight, seems like a newly-discovered "early master," but often as it has appeared before the public gaze it has not found a purchaser. It is considered to be too remote from the present time, and the sterling qualities do not avail. M. Hennebicq's *Flight of Messalina*, happily for the artist, was purchased for the Musée in Mons, for the excellence of the work as a vivid history piece would not commend it to ordinary purchasers. *The People of Ghent rendering Homage to the Infant Charles V.*, by M. Albrecht de Vriendt, is one of the most important examples of historical painting that has been produced in our time, and its merits are freely acknowledged in Berlin. In this case, also, the authorities wisely secured the picture for the Brussels Gallery. The *Daughter of Jairus*, by M. Julian de Vriendt, would be worthy of any gallery in Europe, for it is one of the very few modern works which seem inspired by Scriptural simplicity. The tenderness and reverence seen in the composition would almost suggest that the work was painted for a convent chapel. The works of the two brothers denote that, in spite of the causes which make common life supreme in modern art, the power which once gained reputation for the Belgian School is not yet extinct. They are to the manner born, and their pictures of historical, Scriptural and ecclesiastical scenes give that gratification which is felt when men are seen following their true vocation.

M. Alfred Stevens has his worshippers, and an artist merits to be exalted whose influence has been almost as powerful in Paris as in Brussels. For a *Damenkopf* he is not to be surpassed. In the Berlin Exhibition he can be judged by an *Ophelia*, a *Family* and two sea-pieces, which are novel. But the artists should have secured one of M. Stevens's pastel examples. M. Wauters seems now to confine himself to portraits, and the two in oils are characteristic of his manner, which has secured much favour in Belgium. M. Eugene Smits is never more successful than with subjects of a semi-decorative kind, but we have seen better works from his hand than he was able to send to Berlin. About ninety artists have sent paintings, and thus Antwerp, Ghent, Malines, Ypres, as well as Brussels, are able to claim attention.

The Dutch School could hardly be expected to be otherwise than circumscribed. The success of Josef Israels and Hendrik Mesdag was enough to convince a Dutchman, whether painter or dealer, that fortune was almost certain if some narrow routes were followed, and that ambitious subjects were less marketable than those which were homely. M. Mesdag and his followers were able not only to sell their pictures on enviable terms, but they attracted all the world to Scheveningen, which furnished the scenes and converted one of the simplest of fishing villages into a fashionable resort, where the Dutch folk were able to excel themselves in the art of fleecing strangers. M. Israels could hardly increase the interest of The Hague, but he has performed a greater feat, for he has made tragedy popular after it had been scouted as a bore. He can paint as many suffering heroes and heroines as he likes, and so long as they appear in peasants' garments and their performances are supposed to take place in unlighted and smoky rooms, M. Israels is sure of the patronage of all Europe. The critics become sentimental before his pictures and forget all about proportion and colour. Is it any wonder that, after so much success, a modern Dutch collection should appear to be mainly produced by Mesdagians and Israelites?

In Berlin M. Israels has two works, *Peasants at Table*, belonging to M. Mesdag, and *Alone*, which depicts the deathbed of a woman and the despair of her husband. M. Mesdag has a view of *The Strand at Scheveningen* and a sunrise. There are not other pictures with the same titles, but there is so much derived from the annals of the poor and the quietest features of Dutch landscape that the two heads from Tangiers and Seville by M. Haverman, and the picture of a gipsy before a magistrate become almost fascinating. Quietness is an excellent quality, but there is so much of it in Berlin that it becomes oppressive.

The Danes appear to favour many varieties of art, and under different conditions of training they might form a school. As yet they are, on the whole, more successful in sculpture, thanks to the influence of Thorwaldsen and Jerichau, which still is a factor in the schools. Fuseli's manner is recalled by M. Frolich's *Gottes Auge und Cain*, derived from that fertile furnisher of unpaintable subjects, Victor Hugo. The Swiss artist would also be likely to approve of M. Paulsen's *Adam and Eve*, where the recumbent Adam appears to fear his erring consort, who stands over him. It is creditable to have treated so venerable a subject with novelty. As a rule, the Danes prefer the coldest colours, another sign that sculpture was once uppermost among them, but in the *Flight into Egypt*, by M. Lauritz Tuxen, the light falling on the hills that bound the desert, making them glow with orange hues, is a sign that one artist is not afraid of novel effects. M. Zahrtmann, in his *Death of Queen Sophia Amelia*, has also introduced very rich costumes, and even ventures to show a sort of lustre silk in the dress of one courtier. The *Music in*

the Studio, by M. Severin Kroyer, is a scene often painted, and the artist displays skill in contrasting the darkened room with the illuminated music-books and pictures. Evening light is also well managed by M. Michael Ancher, in his *Fishermen on the Beach*, and the task was not easy to dispose it, for the faces and breasts of some of the figures are in shade. Among the portraits, the most striking is one by M. Jerndorff of a professor who appears to be lecturing on chemistry to students of veterinary medicine.

The landscapes by M. Normann, which have appeared in the Salon and other exhibitions, revealed the existence of a landscape school in Norway. The room at Berlin makes it clear that other members of the school can produce admirable work. The *Storm Scene* by M. Dahl is fine in colour, and the landscapes by MM. Sorensen, Nielsen, Ole Juul, Grimelund and Barth are all marked by careful study of nature. In some cases the detail seems almost photographic in clearness. M. Wilhelm Peters, M. Lerche and M. Nordhagen send figure-pieces, and M. Peters's etchings are known to collectors in many parts of Europe.

Sweden has a scanty show, as there are only eight oil-paintings, most of them being landscapes, and three water-colours. Poland has a rather large collection, and from the novelty of the subjects the pictures are longer studied than those in some larger rooms. It is remarkable how many of the pictures come from private collections. Among the landscapes, those by M. Chelmonski seem to be the most successful.

In spite of the coldness which is said to prevail in the political relations between the two empires, Russia is a large contributor to the Berlin Exhibition, and most of the works come from the Imperial Academy and the private gallery of the Hermitage. A sort of gloomy power is seen in many of them. M. Repin's *Nicholas, the Miracle-worker*, depicts a man about to be decapitated, but the sword is seized by Bishop Nicholas. The subject may not be pleasant, but it is dramatically represented. In his *Departure of the Recruit* M. Repin employs fewer figures, for the scene is a peasant's hut which is not equal to accommodate a crowd, but they are well painted and are expressive. M. Ssawitzki makes his *Despatch of Reservists* a scene at a railway station, and the groups are all vigorously painted. A stranger will be sceptical about the contentment which appears on so many of the faces. M. Bakalowitsch, in his *Clienten*, would appear to be eager to outdo Mr. Alma-Tadema, for the marbles in the gallery, where the visitors surround the *Venus de Medicis*, are most elaborate in finish. M. Von Liphardt has taken a subject which was a favourite with Mediæval sculptors, *The Wise and Foolish Virgins*. The wise are clad in white and the bridegroom appears in a red garment. Another picture is mythological, a sort of Olympian contest. There is a very fine battle scene, *The Storming of Ardagan*, with troops rushing over a bridge, by M. Kiwschenko. A more painless engagement is seen in M. Vesin's *Crossfire*, where the occupants of a sledge are attacked with snow-balls from all directions. Among the landscapes M. Aiwasowski's *Sündfluth* is one of the most striking, and it is plain the artist sympathises with nature when it seems to be most destructive; the darkness adds to the terror of the deluge. M. Bogolubow, in *His First Russian Seafight, May 24, 1714*, has produced a most successful work, in which the spectator seems to perceive the commotion of the contest rather than "painted ships upon a painted ocean."

Next to Germany Austria has the largest collection, especially if Hungary can be included, for in the exhibition the two parts of the empire are separated. Austria shows no deficiency in versatility. There is an abundance of portraits, Herr Von Angeli being considered as the first artist in that line, because he is favoured by Courts. Herr Brozik sends a very big picture, the *Fenstersturz von Prag*, the incident which gave rise, as all schoolboys know, to the Thirty Years War and the composition of "Wallenstein." The excitement of the deputies who turn the tables on their enemies is well rendered, but the artist is more successful with the costume of an earlier time. His *Fest bei Rubens* is likely to be a more popular picture. Of late years Herr Brozik has turned from costume pictures to scenes of daily life, and his two pictures of field labourers are good examples of his new style, but his pageants are preferable. Herr Hirschl has two impressive Roman scenes, one representing the Vandals at their destructive work in Rome, the other a Roman marriage festival. There is much to recall death in the saal. Herr Von Payer represents the *Death of Sir John Franklin*. The cabin is dark, and the light falls on the dying explorer, who is propped up by pillows, the head being in profile. His hand is held by the doctor, and around the couch are officers and sailors. The picture is on a large scale and is skilfully painted. Herr Schindler's *Pax* is an ancient cloister full of graves that seem hewn out of the rock. Herr Laukota has an imaginative work, in which the Blessed Virgin appears as the consoler of the wife of a drowned fisherman. Mrs. Marianne Stokes has a pleasing, if sad, picture of a little boy crying beside his sister's coffin, with the title, "You must now play alone; your sister is in heaven." Herr Schmid paints a group of girls praying before a cross, which is a memorial of those who fell in the war against the French.

At the present time the two schools that dominate are the French and the Hungarian. It is expected that sooner or later either must prevail, and the contest thus resolves itself into one between greys and reds. Hungarian pictures are most dangerous neighbours. The two placed among the examples of modern schools in the Munich Gallery make some of those near them appear as washed out, Mr. Lavery's *Lawn Tennis* and Mr. J. R. Reid's *Fishermen* being among the sufferers. It may be said that the Hungarians go beyond the limits of painting, and that in course of time they must see the error of their ways and produce works that will be subdued. There are in Berlin a few works, like the *Heckenrosen* of Herr Von Baditz, which are French in manner, but as a rule the pictures undoubtedly present characteristics that are recognisable as being Hungarian. The artists can teach much to their brethren elsewhere. Compare the sheep and lambs in the picture by Béla Pállik with any of Mr. T. S. Cooper's, and the difference not only in handling but in mere observation will be apparent. If a Scotsman wished to have a picture illustrative of "John Anderson my Jo," he would be likely, after seeing the *Alten Tagen* of Miksa Bruck, to give the commission to the foreign artist—that is if, for the sake of good work, he could forget his nationality.

The Hungarian room has, too, the advantage of revealing so much that is novel in institutions and customs. Herr Bihari's *Before the Magistrate* suggests the simplicity of legal administration. A plain room, so long as a small crucifix stands on the table, and the justice with his clerk are present, will serve as a courthouse. The case which is being investigated relates to a broken fiddle, and the parties are gipsies. The excitement of the men is well contrasted with the calmness of the representatives of the law, who, if shabby, are dignified. The same artist in his *Rumänisches Leichenbegängniss* represents a woman in an open coffin, a priest who appears to belong to a sect of the Greek Church reciting prayers over the body. Herr Ebner has an *Easter Procession* in which peasants participate as cross-bearers, acolytes and canopy-holders. Herr Vágó, in his *Flüchtlinge*, indicates the sympathy which is felt among peasants for those who have to go through the ordeal of removal. Everybody in the inn where the family rest on the way seems ready to express commiseration. It may be remarked that in proportion to the figure-pieces the landscapes seem to be exceptionally few in the Hungarian section.

The Spanish pictures must excite more curiosity than the Hungarian, for, owing to the lack of enterprise, such works are hardly known beyond the Pyrenees. The immense work by Señor Juan Luna, *Spoliarium*, in which the attendants of the amphitheatre are seen dragging out the bodies of the slain gladiators with hooks, we remember to have seen about ten years ago in the Salon, but the remainder may be taken as novelties. There is little that appears derived from the work of Fortuny or Madrazzo, and, in fact, the variety of style is marked. Señor Cubells is the author of the large *Coronation of Inez de Castro*, a subject that is adapted for all who wish to accumulate horror on horror. After all, one version of it must resemble another. In this case, as in those preceding it, we have the crowned and bejewelled corpse rigidly fixed on a throne, and the

terror-stricken courtiers ranged in front. But there is an addition in the form of a boy, which might advantageously have been omitted, for it seems to be an unnecessary piece of cruelty invented by the artist. Señor Ferrant is evidently a master of chiaroscuro; his *San Sebastian*, which also is on a large scale, depicts the lowering of the body of the martyr into the catacomb, and if the work as a whole appears academic all the figures are modelled with a care that might be called old-fashioned. Señor Sala has given a new interpretation of a subject of which there are several pictures, *Expulsion of the Jews from Spain*, but what is depicted is the interview of the Dominican with the King and Queen, when the order for expulsion was secured by overturning a crucifix, which was said to be a sign of the royal apostasy. In the picture the monk turns his back on the King and Queen. Señor Carboneros's *Don Quixote and Sancho* are unlike the types employed by English and French artists; the knight is far more of a commonplace tourist. The splendour which ecclesiastical ceremonies assume in Spain is indicated by Señor Gallego's *Marriage in the Sacristy of Seville Cathedral* and in the *Benediction*.

The Italian collection is a mixture of works that gratify, with others that disappoint. One can imagine that all the artists are competent, but many are too indifferent to exert their full strength. Carefully painted pictures are companioned by some that seem to be produced as sleight-of-hand feats. Among the works which are most satisfactory are the *Venetian Flower Festival*, by Signor Vannutelli, a religious procession over a range of boats; the *Spring* of Signor Oca Bianca, in which old people and young are introduced; the *Death of Virginia*, by Signor Miola; the *Scirocco*, by Signor Fragiacomo; the *Market Place*, by Signor Favretto. It must be admitted, however, that far finer works were seen in the Italian Exhibition that was held at Earl's Court.

To carry out the international character, there are works shown from Switzerland, Greece, Turkey and Japan, but they have no importance. Without their aid the Berlin Exhibition is attractive, and much is to be gained from a careful examination of its contents.

THE PRESIDENTSHIP OF THE ROYAL SCOTTISH ACADEMY.

On July 28, says the *Scotsman*, at an informal meeting, the Academicians appointed a deputation to wait upon Sir Noel Paton to request him to allow himself to be elected to the presidential chair, vacant by the death of Sir William Fettes Douglas. Sir Noel requested two days to consider the subject. On the 29th a letter was received by the secretary from him declining the nomination. On Saturday afternoon the members of the Academy met in the library of the Academy to proceed with the election of a President. Mr. John Hutchinson, treasurer, was called to the chair. At the outset the secretary (Mr. George Hay) read Sir Noel's letter, which was in the following terms :—

"33 George Square, Edinburgh : July 29, 1891.

"Dear Mr. Secretary,—My friends in and out of the Royal Scottish Academy have always been aware that my aversion to the assumption of public duties and responsibilities is so deep-rooted that at no time could I have sanctioned my nomination as a candidate for the presidentship of that body ; and on the two previous occasions when the office became vacant my unalterable resolution in this matter was made widely and unmistakably known. Naturally this aversion on my part has not diminished with advancing years. But the unanimous desire of my brother Academicians—as conveyed in the formal requisition yesterday presented to me—that I should allow myself to be elected to the presidential chair, places me in a different position ; and had existing circumstances permitted, I should have felt constrained to overcome my personal love of retirement, and at once accept an honour offered in a manner so gratifying to my best feelings as an artist and a man. But—availing myself of the time for consideration courteously conceded by the deputation—I have given the whole question the most anxious and careful thought, alike in its relation to the Academy and to myself, and I am forced to recognise that, at my time of life and with my uncertain health, I could not undertake the onerous duties of President with any hope of being able to discharge these duties in the way the Academy has a right to expect, and as, in the interests of the National School of Art, they ought to be discharged. With the sincerest regret, therefore, I feel that I have no choice but to decline the proffered distinction. Of the confidence so flatteringly indicated by the action of my brethren on this occasion I must ever feel proud, while for their generous assurances of forbearance and assistance in the work of the chair should I accept the office, I must ever feel deeply grateful. In spite of my inability to accept the office of President, however, I trust it goes without saying that for the term of life that may yet remain to me nothing will be wanting on my part to render what humble help I can in furthering those objects for the honour and advancement of art in Scotland which I know the Academy has so deeply at heart, and towards which it is striving, through difficulties which I certainly believe fuller knowledge of its history and wiser sympathy with its efforts, in quarters outside its borders, would materially diminish, if not altogether remove.—Believe me to remain, very faithfully yours,

"Noel Paton.

"George Hay, Esq.,
"Secretary, Royal Scottish Academy."

Thereafter the Academicians unanimously elected Mr. George Reid, R.S.A., to be President. Mr. Reid was not present at the meeting, but his election having been communicated to him by letter, a reply was read from him at the Academy in the course of the afternoon accepting the chair. The *Aberdeen Free Press* gives the following history of the new President :—

Mr. George Reid is the son of the late Mr. George Reid, who as ironmonger and blacksmith, had his business premises in Queen Street, and he was born in Aberdeen about the middle of the forties. The mantle, therefore, of the President of the Royal Scottish Academy falls on comparatively young shoulders, younger probably than those of any former President. Mr. Reid was educated at the Trades School until he was about fourteen, when he was apprenticed to Messrs. Keith & Gibb, lithographic draughtsmen. In the early years of his apprenticeship, Mr. Reid attended the art classes under Mr. Peter Cleland at the Mechanics Institute, where he succeeded one year in gaining a national medal in design. This circumstance had its own influence in promoting the pursuit of art as something more than the work of the mere artisan. Surely there never was a more fruitful apprenticeship. Mr. Reid's hand never tired, and, whilst he became an expert at all the branches of his business proper, and often investing with an artistic feeling what naturally lent itself to the bald and mechanical, he was year by year making rapid strides in art studies, sketching continually in pencil, chalks, water-colours, and in oils, and all with a determination of purpose and enthusiasm seen only in those who are destined to fill a high and honourable place. It may be mentioned here that alongside Mr. Reid were other two who have since followed out the artistic profession with considerable credit—Mr. John Mitchell and Mr. George Russell Gowans, the works of both being well known. For only a few months after Mr. Reid's "time" was out did he hesitate as to his course of duty, but the spell of art growing with his growth soon determined his course. Thus, towards the close of 1861 Mr. Reid made a new departure by boldly entering the life class at the Royal Academy, Edinburgh, and no longer handicapped with a tale of hours spent at a handicraft not wholly subservient to his purposes, he made excellent use of his opportunities.

In 1862 he opened his studio in Aberdeen, and in the fall of that year painted as his very first portrait the likeness of his friend, Mr. John Bulloch. The next year or two was the disciplinary period of the young artist's career, but the excellency of his work soon attracted attention. Its fidelity to nature, the result of infinite painstaking at every stage, was early recognised, and to paint and exhibit was infallibly to sell to connoisseurs eager to buy. From that period till now Mr. Reid's career has been one unbroken run of success. In the earlier period of Mr. Reid's career there can be no doubt that his personal preference and ambition lay wholly in the line of landscape-painting, but commissions in portraiture have been so persistently thrust upon him that to a certain extent he has been thwarted in his own objects. His numerous and varied landscapes make a gallery of great excellence, but his more numerous portraits done in the maturity of his prime of the notables of his day in all circles will remain a grateful enrichment, especially of Scottish life and history. In a manner as wholly his own as was Raeburn's or Ramsay's, Mr. Reid's portraits are second to none, and possess a verisimilitude to life truly remarkable.

In 1865 Mr. Reid, as is often the case with young artists, fell under the influence of a fellow-artist, Mr. Mollingar. This Dutch painter's pictures possessed for Mr. Reid an undefinable charm ; such a positive spell, in short, that in 1866 he passed over to Utrecht in order to be near him, and to paint beside him. There can be no doubt that Mr. Reid caught truth from Mr. Mollingar, namely, the immense importance which attaches to the tone of a picture. It was not, however, till Mr. Reid passed this truth through the alembic of his own methods, until, in short, he bettered the instruction, that he got the better

of the Mollingar influence, and his pictures lost any mimetic trace.

In 1869, he went to Paris and joined the *atelier* of M. Yvon, then largely frequented by students of all nationalities. In that year Mr. Reid painted the portrait of Dr. George Macdonald, which was the first of the artist's works to be engraved. Next year brought Mr. Reid the reward of Associateship of the Scottish Academy, where he had been steadily exhibiting for eight or ten years, and in 1878 he was elected to full membership. It would be impossible in this sketch to detail one-half the important products of Mr. Reid's work in portraiture or landscape, but there is the less need in his native place where his fellow-citizens have with a just pride watched his increasing power and popularity. Suffice it to say that there are few public collections, or for that part not many private collections, which do not possess a coveted specimen of Mr. Reid's work. For many years Mr. Reid's aid in book illustration has been sought and highly appreciated. His character sketches for Dr. William Alexander's "Johnny Gibb" have been much admired. So have his sketches in Dr. Smiles's "Life of Thomas Edward," and the beautiful drawings for the Art Association of Scotland, given to subscribers a few years ago. There is not a variety of the graphic art which Mr. Reid has not essayed and excelled in. His latest book work is in Mrs. Oliphant's recent book on Edinburgh. All his work of every description bears the stamp of care and study, without trace of scamping. For the greater convenience of his numerous clients, Mr. Reid removed to Edinburgh five or six years ago, where he now paints during a large part of the year, using the studio at St. Luke's, Aberdeen, during a portion of the summer. Mr. Reid has been followed in his profession by his two brothers, Mr. Archibald Reid and Mr. Samuel Reid, both of whom exhibit works of high excellence. Aberdeen has been long and honourably distinguished by the artists who have sprung from her, and not least by the notable career of Mr. Reid, with whom the city shares the high honour now fallen on him. Mr. Reid will adorn the position, for he is, besides being an artist of high order, a man of cultivated and literary tastes, of wide reading, and has written not a little on subjects relating to art.

BRITISH ARCHÆOLOGY IN GREECE.

A CORRESPONDENT of the *Times* writes as follows:—The progress of classical study and exploration in Greece cannot fail to be a matter of interest to Englishmen of ordinary culture and education—not to speak of specialists and scholars; and your readers may be naturally disposed to inquire whether British learning and research are adequately represented in the international competition for archæological honours to which the career of Dr. Schliemann has given such a powerful stimulus.

In the foundation of an institute for the prosecution of archæological research in Hellenic lands France has been first in the field. The handsome Ecole Française at Athens was founded as far back as 1846. It belongs to the French Government, and receives a subvention from the State; it is under the direction of distinguished scholars, and its junior members are chosen from among the most promising students in the University of France. The stipend of both is paid by the Government, and includes allowances for travelling expenses and exploration. The German Archæological Institute, which is younger by twenty-three years than its French competitor, is also a Government foundation, and receives an endowment, which, though liberal, is hardly commensurate with the splendid services rendered to archæological science by the eminent men who have been connected with the School. The French discoveries at Delos, Delphi and elsewhere hardly yield in importance to the better-known results of German exploration; but a comparison of the achievements of either School would be out of place here; it is sufficient at present to emphasise the fact that both these institutions receive State support, and stand on what may be described as a sound financial basis. With regard to other nations, Austria-Hungary is unrepresented, and so is Italy; the latter, however, may plead that she is fully occupied with her own vast treasure of Hellenic remains. A Russian School of Archæology has long been talked of, but it now seems probable that the building will be erected, not at Athens, but at Constantinople, its projectors, no doubt, cherishing the hope that it may one day be found to stand on Russian soil. The Greek *savants* do not yield in zeal and ability to their brethren from abroad, and the native antiquarian associations at Athens are directed by skilled and accomplished archæologists.

Greek scholarship and research among English-speaking peoples find a *pied à terre* at Athens in the British and American Schools of Archæology. The modest scale on which these institutions have been designed and equipped is somewhat in contrast with the more elaborate installation of their French and German rivals. As the visitor makes his way along the southern slope of Mount Lycabettus in an easterly direction, he finds at the outskirts of the town two unpretending, villa-like structures, standing in their own grounds. The nearer and smaller of the two is the British School of Archæology, the larger and more distant is the American School. The British School, which in reality is nothing more than the director's house—apartments for students not yet having been provided—was erected in 1886 on a site presented by the Greek Government. The situation is healthy and beautiful, commanding charming views of Hymettus, the Gulf of Ægina and the distant hills of the Morea. The principal feature of the building is a large and well-stocked library, from which not only the students of the School, but English and other visitors to Athens can borrow standard editions of the classics, as well as most of the important works on Greek history, art, topography and archæology. The absence of accommodation for students is a serious defect, and is due to want of funds; the students, of whom twelve were admitted during the past session, are for the most part obliged to find lodgings in the town. This is only one among many instances of the manner in which the British School is crippled by a deficiency of ways and means; and the fact that it is compelled to lead a struggling existence is, it must be said, not altogether to the credit of the richest nation in the world.

Notwithstanding its straitened circumstances, the British School has contrived to hold its own against its older and more richly endowed competitors. It has not, of course, accomplished anything to rival the German excavations at Olympia; it has not, as yet, discovered a Hermes, nor can any of its members claim a European reputation such as that of Dr. Dörpfeld. Nevertheless much has been effected. Not to speak of the researches prosecuted in Cyprus by members of the School in recent years, the excavations carried out last season, for the first time, on the Greek mainland have yielded results of the highest interest and importance. The field of operations was the site of Megalopolis, the "great city" of Western Arcadia, which owed its origin to the genius of Epaminondas. The excavation lasted over eleven weeks, some ninety native labourers being employed. In addition to the discovery of an enormous stoa with a triple line of columns, and a remarkably fine altar adjoining it, a large theatre in good preservation was partially dug out, the front row of seats, or Θρόνοι, bearing inscriptions of the classical period; and an elevated stage was laid bare, the construction of which appears to determine in the affirmative the long-debated controversy as to whether the Greeks used the proscenium for the purposes of a stage. A tumulus was also excavated, and a cylindrical stone vessel brought to light, containing human remains and some interesting gold ornaments, probably of the Hellenistic period. Among the inscriptions discovered was a Greek version of the celebrated edict of Diocletian, which regulated the prices for which various commodities were to be sold. The excavations are to be resumed in the present year, but some 300*l.* is needed for their completion.

But the excavations carried out by the British School, however valuable in their results and interesting to the world of antiquarians, can hardly be regarded as the most important portion of its work. Its educational labours are of still greater consequence. Every year some of the most brilliant scholars of their time at Oxford and Cambridge—as a rule young men who have just taken their degree—are admitted as students, and during their residence at Athens they are furnished with opportunities of studying, under competent direction, those unique remnants of ancient art which throw such a powerful light on the life, the literature and the civilisation of classical Greece. Hitherto their ideas have been derived from books or from book-taught men; now they see before them the handiwork of Phidias and Iktinos; they hear the voice of Pericles in the Pnyx, and wander with Plato in the "groves of Academe;" around them are the mountains and the sea which inspired the genius of antiquity with a thousand fancies, and were peopled by it with a thousand forms. They are thus enabled to enter into the spirit of the past, while in their daily life they hear the echo of a noble tongue which, "though dead, yet speaketh." They can acquire without difficulty a knowledge of modern Greek, and, without adopting the theories of those who hold that ancient Greek can best be taught through the medium of the spoken language, it must be admitted that even a moderate acquaintance with the latter is a distinct gain to the classical scholar. Many of the students return to England to engage in the instruction of others; they transfer the keenness of their appreciations to their teaching, which undoubtedly gains in thoroughness and efficiency. If the life, the thoughts, the deeds of the ancient Greeks had hitherto been made more of a breathing reality to the British schoolboy, we should perhaps hear fewer murmurs nowadays about "compulsory Greek."

While archæological study is more and more becoming an indispensable part of the outfit of a classical scholar, it is of great importance that promising young students should acquire, at first hand, so to speak, a real grasp of its present state and methods. In addition to such means of instruction as the excavations

already described, and excursions to places of importance in the neighbourhood of Athens, a twofold system of lectures has been adopted by the British School. The lectures may be described as esoteric and exoteric. The former, which are intended primarily for the students of the School, are delivered alternately at the School, or at some museum or on some site at Athens, the proceedings being of an informal nature, and varied by questions and discussions. The latter are more formal in character; papers giving the results of original study and research are read by the directors and the students; and members of the other archæological schools, as well as residents and visitors at Athens, are invited to be present. The attendance at these lectures, as a rule, is highly satisfactory, sometimes amounting to about fifty persons, of whom perhaps half are temporary sojourners at Athens. It should be mentioned that the labours of the students are not altogether confined to the classical period; two of them, for instance, are now occupied with a work of the greatest interest and importance on the Byzantine churches of Greece.

The British School not only furnishes instruction to all visitors at Athens who take an interest in Greek antiquities, but it also serves as a means of help and a centre for information to such of them as intend to travel in Greece. Its usefulness in this direction may be almost indefinitely extended in the future. The number of Englishmen who visit Greece increases annually, and at Easter-time last year there were perhaps more than fifty Oxford or Cambridge graduates and undergraduates at Athens, besides a host of other educated persons, English and foreign. When the railway now being constructed in north-eastern Greece is extended to Salonica, Athens will be brought into connection with the European railway system, and may possibly become the place of embarkation for the Anglo-Indian mail. A large influx of English visitors would follow, who would find Athens a more tempting resting-place than that very uninviting spot, Brindisi. There are some, indeed, who are sanguine enough to believe that the ancient "mother of arts and eloquence" may once more become an international centre of education when she finds herself on the high road between east and west. However this may be, it appears certain that the crowd of appreciative and cultured Englishmen will increase year by year at Athens, and that the British School of Archæology, in forming a centre-point for this learned society, will find its sphere of usefulness widening every day.

Unhappily there is a drawback to this pleasing prospect. The financial position of the School is not such as to warrant a very hopeful view of its future career. While the British Government declines to afford support such as is given to the French and German Schools by their respective Governments, the British School must depend upon the subscriptions of individuals for a somewhat precarious existence. Oxford, indeed, gives 100*l.* per annum for a period of three years, but the sister University has not yet followed the good example, though giving occasional grants to individual scholars connected with the School. The present total income of the School is below 450*l.* per annum, a sum which would scarcely suffice to form an adequate salary for the director. The expenses of excavations have to be met by special appeals for subscriptions, and, when showy or sensational results are expected, sufficient contributions are generally forthcoming. But such a system as this is fatal to sober, steady and conscientious work. If Government support must be despaired of, is it too much to hope that some wealthy patron of learning, some British Mæcenas, may yet come forward to rescue British archæological research in Greece from a position of disadvantage as compared with its French and German rivals? Though "pass Greek" may disappear from the Universities, there is no reason to apprehend a decline in higher Greek scholarship in England, more especially if young students are enabled to find a training of the utmost value, auxiliary to that of the University, in the pursuit of archæological study in Greece.

THE SOUTH KENSINGTON MUSEUM.

THE report of the Science and Art Department contains the following remarks on the Museum at South Kensington:—

The pressing need of additional space for both the science and the art collections of the South Kensington Museum has been frequently discussed for some time past, both in and out of Parliament, and has been the subject of a considerable amount of correspondence between the Science and Art Department, the Treasury and the Office of Works. The purchase from the Royal Commissioners of the Exhibition of 1851 in February last of the central portion of the southern galleries and of a large block of the adjacent ground will provide space for a building for the science collections in accordance with the recommendations of the Treasury Committee on the science collections, which reported in 1889, and the First Commissioner of Works has recently invited a limited number of architects to furnish designs for the completion of that portion of the South Kensington Museum which is on the land to the east of Exhibition Road.

Sir P. Cunliffe Owen, the director of the Museum, states that the number of visitors at South Kensington Museum was 831,460, and at Bethnal Green 402,989, during the year 1890, or a total of 1,234,449, which shows a falling off of 66,988 on the numbers in the previous year.

Art Museum.—The number of objects acquired for the Art Museum by purchase, gift, or bequest, was 927, of which 44 were for the Indian Section. The principal purchase during the year was a collection of examples of Italian art from Signor Bardini, of Florence, for 3,428*l.* This collection comprises an ancient Roman column of marble, carved with foliage; fourteen stone ends of steps, carved with animals, &c., from the Palazzo Gondi at Florence, commenced by Sangallo in 1490; a wall fountain, of the end of the fifteenth century, with carved foliage, dolphins and birds; a cabinet, decorated with intarsia work of the sixteenth century; a balustrade from Ferrara, with dwarf gilt columns on a decorated background, early sixteenth century; a niche for a statue, of carved wood and gilt ornament; a pair of doors carved with griffins in low relief; a "cuir-bouilli" comb case of the fifteenth century; a Della Robbia frame and base; and upwards of fifty examples of Italian sixteenth-century coloured and stamped leather. A carved-wood altar-piece, formerly in the sacristy of the church of S. Agostino, Piacenza, representing the Nativity, and above, the Crucifixion, with figures of the Virgin and holy women, mounted soldiers and groups of men and women, by an unknown artist of the sixteenth century, was purchased from Signor Favenza, of Venice, for 1,377*l.* Among the other purchases were two bas-reliefs of the Virgin and Child, Italian, fifteenth century, one of painted terra-cotta, the other of painted stucco (118*l.* each); and an Italian coffret of the fifteenth century, decorated with figures in gesso-duro (467*l.*); a long dividing shaft in inlaid bronze, from the doorway of a mosque at Broussa (140*l.*); and a Medici porcelain bottle (50*l.*). Two English seventeenth-century carved chairs and a painted tray from Florence, of the fifteenth century, were bought at the sale of the collection of the late Mr. W. Maskell. An English carved bedstead, dated 1593, with the arms of the Courtenays of Devon (357*l.*), and four carved English chairs, with the arms of Thomas Wentworth, first Earl of Strafford (48*l.* 6*s.*), were acquired at a sale at Turton Towers. Besides these may be mentioned a French Sedan chair, painted and decorated in the style of Louis XV., and a settee and chairs, English work of the last century (140*l.*); and several fine examples of Belgian, Italian and French lace (128*l.*). A Flemish tapestry wall-hanging, woven about the year 1520, with an allegorical subject, forming a portion of a set representing "The Seven Deadly Sins," was bought for 550*l.*, and a Persian carpet of fine design for 150*l.*

Amongst several important bequests and donations received have been a large iron grille, formerly in the cathedral of Constanz, of the date 1646, given by Mr. J. Starkie Gardner; an English harpsichord and an organ harpsichord, dated 1579, formerly in the chapel at Ightham Mote, near Sevenoaks, given by Mrs. Luard Selby. Mr. H. Martyn Kennard gave a tapestry-woven woollen tunic, found during excavations made in Egypt by Mr. W. M. Flinders Petrie, who has also presented specimens of similar work. The late Mrs. A. V. Jodrell having bequeathed the whole of her art collections to the Museum, a selection was made of about 150 articles, including examples of pottery, Wedgwood plaques, miniatures and bijouterie. A valuable and important collection of lace, bequeathed by the late Mrs. Bolckow, comprises fine examples of Venetian rosepoint, Brussels pillar lace and French needlepoint, a flounce of Brussels pillow lace, given by Madame de Maintenon to Archbishop Fénélon, and a priest's alb trimmed with a deep flounce of Venetian rosepoint. Some valuable articles of modern jewellery were also included in this bequest. The late Mr. Joseph Bond having died intestate and without heirs, his important collection of English plate of the last century, which had been lent to the Bethnal Green Museum, reverted to the Crown, but in accordance with the intention expressed to several friends during his lifetime to leave it to the South Kensington Museum, it was, by direction of the Lords Commissioners of Her Majesty's Treasury, handed over to the Science and Art Department. The Great Eastern Railway Company has presented the carved wood front and other portions of the recently removed house called the "Sir Paul Pinder," in Bishopsgate Street, built in 1600.

From Sir P. Cunliffe Owen's report it appears that the reproductions acquired in 1890 comprised 35 electrotypes, 99 copies of Italian medals, cast in copper and chased by Liard, and 117 plaster casts. Among the electrotypes are a copy of the bronze bas-relief of St. John, by Donatello, and 11 articles in metal selected from the Museum collections.

The additions to the collections of casts of the Italian Renaissance have been eight of the marble statuettes by Niccolo Pisano on the pulpit of the Duomo, Siena; four of the marble reliefs by Lorenzo Ghiberti on the tomb of San Zenobio in the

Duomo, Florence; a marble panel in low relief of the Virgin and Child in the Palazzo Panciatichi, Florence; and a relief in marble of cupids holding a wreath, in the church of S. Martino, Lucca, by Donatello; a relief in marble attributed to Rossellino, at Poggio Imperiale, near Florence; a relief in bronze of the Crucifixion, by Pollaiuolo; and a marble relief of the Virgin and Child, by Mino da Fiesole, in the Museo Nazionale, Florence. Of the works of Bendetto da Maiano, copies have been taken of a relief in marble of the Virgin and Child; three of the marble reliefs on the shrine of S. Bartolo in the church of S. Gimignano, near Siena, and a roundel in the same church of the Virgin and Child and cherub heads within a border of fruit and flowers. A pietà of marble in the church of Fontegiusta at Siena and a holy-water basin in the Duomo, Siena, by Lorenzo di Mariano, have also been copied. Casts have also been taken of the following works in terra-cotta :—The figure of a boy by Andrea del Verrocchio, in the Palazzo Vecchio; two kneeling angels by Luca della Robbia in the Duomo, Florence; a Della Robbia roundel of the Virgin and Child with cherub heads and a border of flowers, and a roundel with the head of a lady attributed to Andrea della Robbia, in the Museo Nazionale, Florence; and also three of the subjects of the frieze by Giovanni della Robbia on the Ospedale at Pistoia, coloured from the original. Copies of several important examples of French sculpture have been recently added. These include four of the niches of a doorway and two bas-reliefs, the Assumption and the Coronation of the Virgin in Notre Dame, Paris; the base of the Draper's Pillar in Rheims Cathedral; and a retable with figures of the Apostles and a Crucifixion in the church of St. Germain (Oise), all of the thirteenth century. Of works of later date are the rood-loft in Limoges Cathedral, erected in 1543; the doorway of the Hôtel Cujas, Bourges; a chimney-piece of the Hôtel Lallemant, Bourges, erected about 1572; an entablature of a chimney-piece by Jean Goujon, and several pilasters and other details of carved ornament from the Châteaux d'Anet and Blois. A reclining figure in high relief by Clodion, *L'Eté*, and a panel with the figure of *La Danseuse*, both eighteenth-century work, have also been acquired. A cast of Flaxman's statue of William Pitt, erected in Glasgow in 1812, has been made for the Department by permission of the Corporation of Glasgow. A copy in stucco of one of the arches of the Alhambra, made to scale and coloured by Don Rafael Contreras, has been presented by the Countess von Bothmer.

Mr. T. Armstrong, the director for art, reports that the pictures and drawings under his charge are in good condition, and that, as heretofore, full precautions have been taken for their preservation. Among the additions made by purchase to the historical collections of water-colour drawings by British artists during the past year, the first in quality and in costliness is a well-known work of the late J. F. Lewis, R.A., called *A School at Cairo*. Second only to this in importance is a drawing of *Crusaders on the March*, by Sir John Gilbert, R.A. In this a large number of small figures are represented in a landscape, and it illustrates the methods of composition and execution of the master in what many consider his happiest manner.

At the sale of the collection of the late Dr. Percy many very interesting examples of the earlier masters of water-colour art were acquired. Some of these artists were not before well represented in the collection, others not at all. In a few cases, although the Museum already possessed representations of an artist, another was bought on account of its great excellence and freshness. From this sale eighty-four works were added to the gallery, and in recent years no acquisitions from any single source by gift, bequest or purchase have gone so far towards completing the continuity of this most valuable historical collection. The late Miss E. Robinson, of Liverpool, bequeathed a good oil-painting, by Creswick, of *The Land's End*, and two pictures of Welsh landscape by Thomas Danby; also water-colour drawings by Carl Haag, A. D. Fripp and the late E. Duncan. An oil-painting by the late Thomas Heaphy has been presented by his widow, Mrs. Heaphy. Mr. Edwin Lawrence, who is not for the first time a benefactor to the Museum, has given nine portrait heads in crayon and pastel by John Russell, R.A., which illustrate in an interesting and valuable way the method of working in pastel of this well-known portrait artist. From Mr. Lindo Myers we have received a present of a portrait in sepia of the late Mr. Sheepshanks, by W. Mulready, R.A. The proprietors of the *Graphic* illustrated paper have presented a large drawing in tint executed on a wood block, of *Mounted Infantry at Aldershot*, by W. Small. It is an admirable specimen of the kind of work, and a welcome addition to the small collection the Museum already possesses of drawings on wood made for engraving.

Indian Section.—Mr. C. Purdon Clarke, the keeper, reports that the number of visitors to the Indian Art Collections during the year 1890 was 122,434, a slight decrease as compared with 1889. In the course of the year 283 objects were presented to the Museum, including the Burmese regalia, which has for some years been exhibited as a loan from the India Office. The bullion value of this collection was estimated to be 21,157*l.* 10*s.* The Museum has also received a collection of 112 Indian musical instruments, formed and presented by Rajah Sir Sourindro Mohun Tagore, Kt., Mus. Doc. Forty-four objects were purchased at a total price of 172*l.* 1*s.*; 232 objects have been received on loan, and three returned to the lenders; while 487 objects in 20 collections were issued on circulation to local museums, &c., and 16 collections (441 objects) were returned. In addition two important loan collections were issued, one of 176 objects, generally representative of Indian art, to the Bethnal Green Museum, and one of Indian metal-work and weapons (234 objects) to the exhibition of the Armourers' Company.

Art Library.—By the death, on June 20, 1890, of Mr. Robert H. Soden Smith, the Museum has lost one of its oldest officers. Mr. Smith had held the post of Keeper of the Art Library since 1866, having entered the Museum in 1857. His intimate acquaintance with many branches of art, and his readiness to give information were widely known and appreciated, and his loss very generally regretted. His successor, Mr. W. H. James Weale, who entered on his duties on August 22 last, reports that the attendance in the Art Library during the past year has been larger than in any of the three previous years, reaching to 27,561 as against 27,396 in 1889. The number of volumes and pamphlets acquired has been 266 presented and 1,452 purchased. Among these are some of considerable interest and great rarity; for example, John Erard Heiglen's "Gantz neue Erfindüngen unterschiedlicher Arten von Servicen," Augsburg, 1721; John Baptist Hagenauer's "Nouveaux desseins d'ornemens de meubles," Vienna, 1783, and Joseph Garcia Hidalgo's "Principios para estudiar el Arte de la Pintura," Madrid, 1691, copies of which are not to be found in any public library in England; and a volume containing outline engravings by Thomas Piroli of fourteen of Pippi's celebrated frescoes in the Villa Lante at Rome beautifully coloured by hand. 2,558 drawings, including a number of beautiful ornamental designs by Carter, and a collection of coloured drawings of badges and standards of noble families have been added, as also 2,370 prints, amongst which are 495 proofs on India paper of the woodcuts in Hone's "Every Day and Table Book." The collection of photographs has been increased by 6,721, chiefly of specimens of Italian art. 1,758 books, drawings, prints and photographs have been lent to the National Art Training School and other schools of art, &c.

A ROMAN VILLA.

A CORRESPONDENT of the *Lincolnshire Chronicle* writes: For some weeks past, remains of a Roman villa have been exposed to view by Mr. Ramsden's miners in the Greetwell Fields. From the extent of the tesselated pavements laid bare there is hardly any doubt that in the Greetwell Fields, in centuries long gone by, there stood a Roman mansion, which for magnitude was perhaps unrivalled in England. Six years ago I drew attention to it. The digging for iron ore soon after this was brought to a stand-still by the company, which at the time was working the mines, ceasing their operations. Then the property came into other hands, and since then more extensive basement floors of the villa have from time to time been laid bare, and from tentative explorations which have been just made, still more floors remain to be uncovered which may be of a most interesting and instructive character. What a pity it is that the inhabitants of Lincoln have not made an effort to preserve these precious relics of the grandeur of the Roman occupation, an occupation to which England owes so much. From the Romans the people of this country inherit the sturdy self-reliance and perseverance in action which have helped to make England what it is, and from the Romans too, in a great degree, does England also inherit her colonising instincts which impel her people to cover the waste places of the world with colonies. If the Roman remains which have been so abundantly discovered of late years in Lincoln and its vicinity had been collected and laid out for exhibition, they would have formed a most interesting collection of antiquities worthy of the town, and well worth showing to visitors who now annually make Lincoln a visitation. Although these relics of a remote age are being dug up and are being destroyed, it is not the fault of Mr. Ramsden, for he not only preserved them as long as he conveniently could, but he also had the soil removed from over them, and had them thoroughly washed, in order that people might have an opportunity of seeing their extent and beauty. One of these patches of pavement extended 48 yards northward from what might be called the main building, which had previously been broken up. This strip was 13 feet in breadth, and down its centre ran an intricate pattern worked in blue tesseræ. The pattern is much used in these days in fabrics and works of art, and is, I think, called the Grecian or Roman key pattern. On each side of this ran alternately broad ribbons of white and narrower ribbons of red tesseræ. There is also another strip of pavement to the south of the preceding patch, which has been laid bare to the extent of 27 yards. This patch is about 10 feet in breadth, and its

western portion is cut up in neat patterns, which show that they formed the floors of rooms. From the eastern extremity of these floors evidently another long strip of 48 or 50 yards still remains to be uncovered. Doubtless there are other remains beneath the ground which will be laid bare as the work of mining goes on. All these floors were not deeper than from 18 to 30 inches below the surface of the soil. The bones of animals and other relics have been found in the covering soil, and have been turned up by the miners from time to time. The pavement is all worked out with cubes, varying in size from an inch and a half to two inches square, each piece being placed in position with most careful exactness. The strip which extends 48 yards and is 13 feet wide runs due north and south. There is a second patch, running east and west, and this is 27 feet long by 10 feet wide, whilst a third is 27 feet long by 11 feet wide, this also running in a northern direction. To the north of this latter piece, and separated only by about two feet (about the width of a wall, which very possibly was the original division) there is a strip of tesseræ 16 feet wide, which had been laid bare 40 yards. It was thought probable that at the end of the last-named strip still another patch would be found. Mr. Ramsden, the manager of the Ironstone Works, is keeping a plan of the whole of the pavement, which he is colouring in exact imitation of the original work. This, when completed, will be most interesting, and he will be quite willing to show it to any one desirous of inspecting the same. Many persons have paid a visit to the spot where the discoveries have been made, and surprise is invariably expressed at the magnitude and beautiful symmetry of the work.

WESTMINSTER ABBEY.

THE following remarks by Mr. Shaw Lefevre, M.P., on the report of the Westminster Abbey Commission appear in the *Times*:—

The report is most satisfactory in two respects—the one that the Commissioners unanimously and most emphatically affirm the necessity of an addition to the Abbey, in which the long roll of monuments to illustrious persons, coming down to us from the earliest times, may be continued in future generations; the other that they urge the necessity of removing the unsightly houses in Old Palace Yard and Poets' Corner, which are a danger and a disfigurement to the Abbey.

It is disappointing, inasmuch as the Commissioners are evenly divided in opinion as between the two schemes for providing such additional space to the Abbey, one-half of them being in favour of a chapel on the site of the ruins of the refectory, the other of a chapel on the site of some of the houses in Old Palace Yard. If there had been unanimity on behalf of either of these schemes, the report would probably have been conclusive with the public, and would have formed, without further discussion, the basis of future action.

In view, however, of the evenly-balanced opinion of the Commissioners, the question must be decided by public opinion, and it will be well that the fullest information should be afforded the public before a conclusion is arrived at. The report is defective in this sense—for while it gives all the arguments which can be urged in favour of the refectory scheme and against the alternative, it is silent as to the reasons which induced one-half of the Commissioners to reject the refectory site and to prefer the other. This defect has been partly removed by the letter of Sir Henry Layard, stating shortly the reasons which induced him, the Dean of Westminster, and Sir Frederick Leighton to differ from their colleagues. This explanation, however, is insufficient as a guide to public opinion, in the absence from the appendix to the report of the designs which Mr. Pearson, the architect of the Abbey, laid before the Commission for the proposed chapel in Old Palace Yard, without which it is difficult for anyone to understand its relations to the Abbey and the extent to which it would leave open a view of the chapter-house and the south front of the Abbey.

An elaborate design prepared by Mr. Pearson at the request of the Commission for the interior of a chapel on the refectory site is given in the appendix. It is difficult, therefore, to understand why the drawings for the other scheme are not also given, and why the personal explanations of Mr. Pearson and his reasons for preferring this scheme, as given at the last meeting of the Commission, were not taken down by a shorthand writer and printed in the appendix.

Mr. Plunket, in reply to my question on this subject in the House of Commons, declined to produce these designs, but he said that he should have no objection to Mr. Pearson's making them public if he should wish to do so. I have since been permitted by Mr. Pearson to see these designs, and I am authorised by him to say that, when he has completed a further drawing, showing in perspective the proposed chapel and its relation to the Abbey and the chapter-house, he will take steps to make them public. In the meantime it seems to me it will be well that the public should reserve its final judgment as to the comparative merits of the two schemes. There are doubtless advantages, merits and difficulties in both of them, and it is only by a careful estimate of the balance of them that a conclusion can be arrived at. The main object to be aimed at is that the building, wherever placed, should be of dignity and stateliness not unworthy of the Abbey, and as closely attached to it as possible, so that it may be regarded as part of the Abbey, and that it should be capable of extension hereafter, whenever there should be demand for further space.

The chapel on the refectory site, as shown in the design by Mr. Pearson, would undoubtedly have a very pleasing interior. It would be 130 feet long by 37 feet wide, and it would have a stone roof. Its exterior, however, would not be visible from any point. This, strangely enough, appears to be considered as an advantage by some members of the Commission. Its defects are that it is removed from the Abbey by two sides of the cloisters; that there is danger that it might be treated rather as a lumber-room; that its north wall would be the existing remains of the refectory, dating from the time of Edward the Confessor, and, therefore, could not be interfered with; and that, in consequence of its narrow width, the chapel would be less suitable for the erection of monuments than a building with side chapels. The scheme will also be strongly objected to by the authorities of Westminster School, on account of its interference with Ashburnham House, recently acquired by them.

The chapel on the site of Old Palace Yard, as now suggested by Mr. Pearson, would consist of a nave with two aisles on either side, the nave 77 feet in height, the aisles 46 feet, the length of the building 103 feet. It would not be necessary that the whole of this building should be erected at present. The two northern aisles, with the cloister connecting them with the Abbey, would alone provide a space equal to that of the refectory chapel, and would suffice for many years to come. In this view it would be unnecessary to purchase or remove No. 5 Old Palace Yard, Mr. Labouchere's house, a point of importance from a Parliamentary point of view. The two aisles and their connections with the Abbey would cost about the same as the chapel on the refectory site, a little over 30,000*l*. The line of the new building would be 94 feet from Henry VII.'s Chapel, a distance which would open out very fully a view of the chapter-house. The aisles, being about the height of the aisles of Henry VII.'s Chapel, would not vie in any way with the main building of the Abbey. It is, however, only by inspection of the drawings that an adequate idea can be realised of the relation of this chapel to the Abbey and the chapter-house. In my humble judgment the main features of the building are exceedingly beautiful, and it would group well with the Abbey.

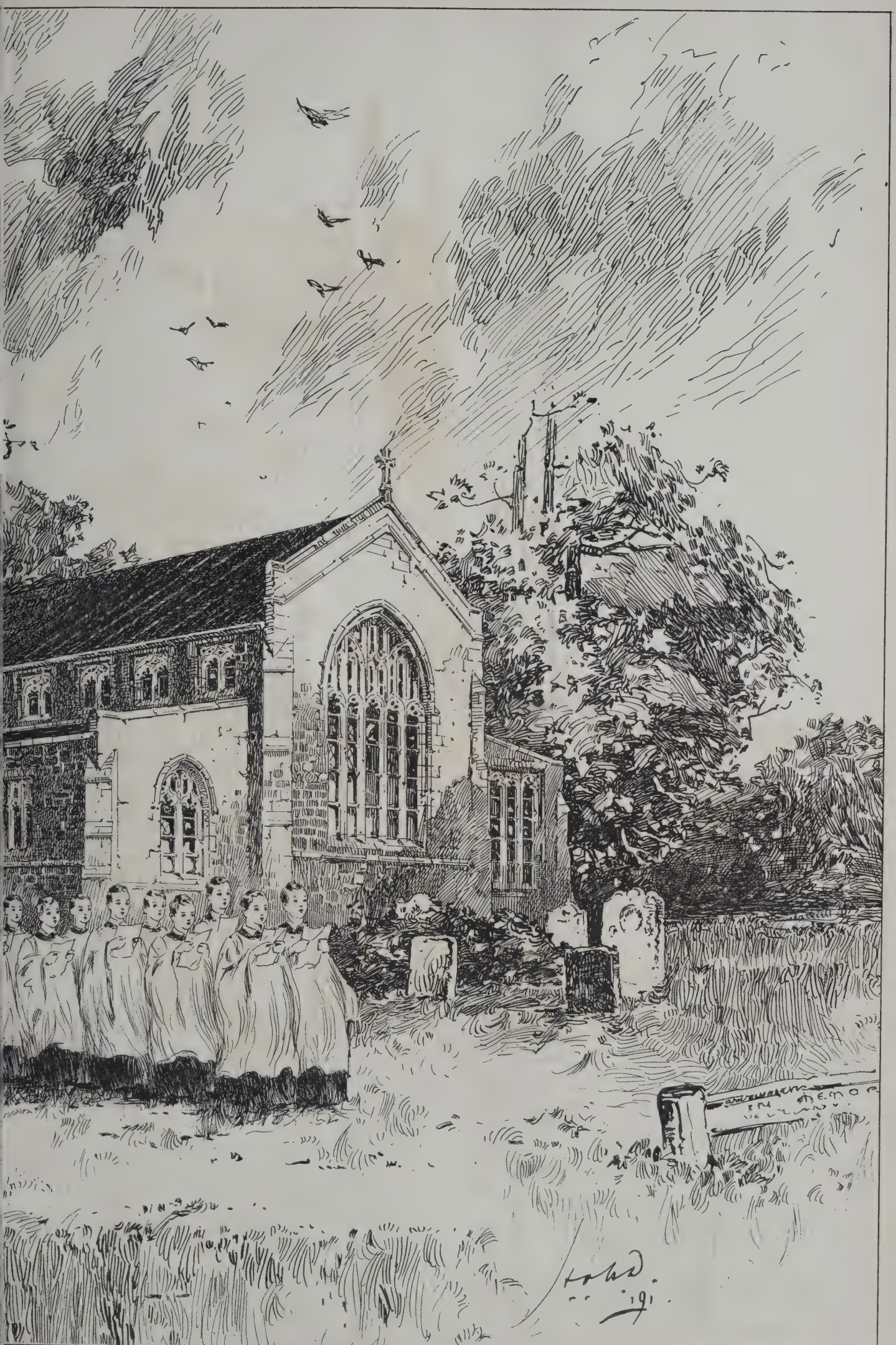
It was proposed in 1889 that the cost of the whole scheme should be borne jointly by the Government and the Ecclesiastical Commissioners, in whom the property of the Chapter of Westminster is vested, and by public subscription, and in this view a very influential committee was formed for the purpose of raising subscriptions. It will be matter for consideration whether this committee, or any other that may be formed, will be equally willing to make exertions to raise funds for a chapel on the refectory site. For my own part, while very much preferring the other scheme as more dignified and complete, I shall give whatever support is in my power to any scheme which may meet with general approval, and which shall achieve the main objects in view; and I am only concerned that the materials for forming a judgment should be fully before the public before a final decision is arrived at.

ROMAN REMAINS AT TWYFORD.

SEVERAL interesting fragments of Roman work have been brought to light in the course of excavations that are being made for building purposes at Twyford, near Winchester. About a month ago, a paved way, composed entirely of small red tiles, six feet in width and extending probably a considerable distance (a length of 14 feet was uncovered), was found while digging on the site for flints. The more recent excavations are 20 feet west of this passage, and there is now to be seen, in a very perfect state of preservation, an oven or kiln with three openings. Five yards away from this is a chamber about eight feet square, paved with tiles, and the sides coated with a reddish plaster. On one side is a ledge 15 inches from the ground, extending the whole length of the chamber; on the floor is a sunk channel with an opening at the end for the water to escape. This chamber evidently represents the bath. Portions of the dividing walls of the different chambers have also been discovered, together with various bones, teeth, horns and ornaments, but very few coins. It is probable that an alteration in the plans of the house which was about to be built on the spot will be made so as to preserve all the more interesting features of these remains in the basement. These discoveries were made at a depth of only two or three feet from the surface of the ground, and are within about a quarter of a mile of other Roman remains which were similarly brought to light a few months ago.



S Chad's Church
WYBUNBURY
James Brooks f.R.I.B.A. Arch.t





NK-PHOTO SERVICE, 6 EAST HARDING STREET FETTER LANE E.C.

SINGING GALLERY, BY DONATELLO. (MUSEUM OF S. MARIA DEL FIORE, FLORENCE.)

Recently Restored by PROFESSOR DEL MORO.

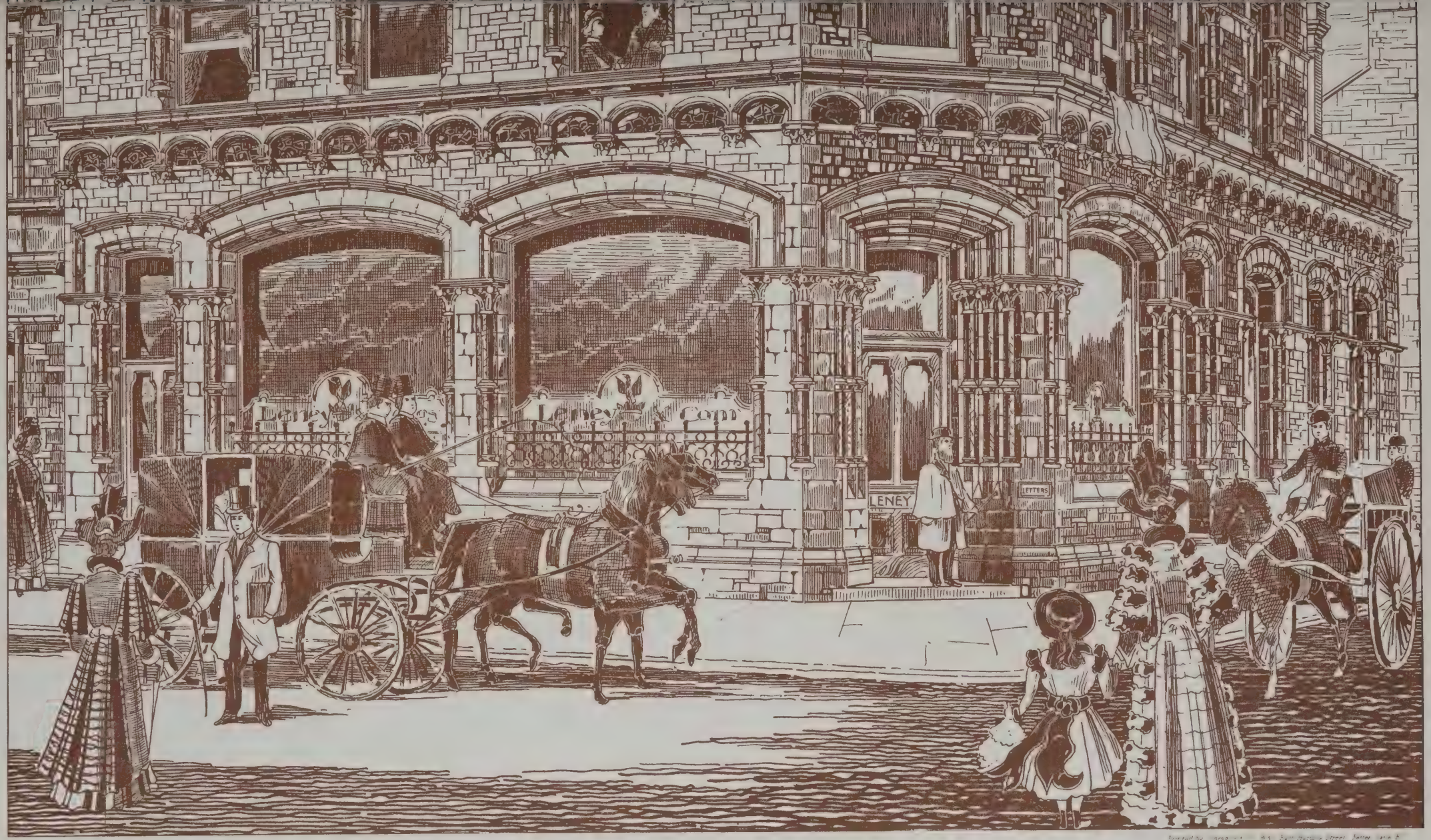


The Architect, Aug 14th 1891.

WESTFIELD COLLEGE, HAMPSTEAD.

Messrs. READ & MACDONALD, Architects.





BUSINESS PREMISES, DOVER.

HENRY WARD, Architect

ILLUSTRATIONS.

ST. CHAD'S CHURCH, WYBUNBURY.

THE church illustrated, consisting of nave, chancel and aisles, is to be erected on the site and in place of the old church now being demolished through failure in or rather want of foundations. The new church has been designed by and is to be built under the supervision of Mr. James Brooks, F.R.I.B.A., architect, of 35 Wellington Street, Strand, at a cost of about 7,000*l.* The old church was rebuilt, and the tower, which dates from the fourteenth century, brought back to its perpendicular in 1832.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 396.—SINGING GALLERY BY DONATELLO.

NO. 397.—WESTFIELD COLLEGE, HAMPSTEAD. [MESSRS. READ & MACDONALD.]

BUSINESS PREMISES, DOVER.

THE brewery premises of Messrs. Leney & Co. cover an area of about three acres, and are mostly constructed of rubble walling and stone dressings. The illustration which we give this week shows a portion of the buildings used as offices, which has been recently erected by Messrs. Stiff, of Dover, under the superintendence of Mr. Henry Ward, architect, of Hastings.

ARCHITECTURE AND HYGIENE.

ON Tuesday Sir A. W. Blomfield, A.R.A., delivered an address as president of the architectural section of the Congress of Hygiene, in which he said :—

The title of this section, "Architecture in Relation to Hygiene," is clear and precise ; but it has, no doubt, occurred to many who have read it that it involves a question to which it is by no means easy to give a clear and precise answer—"What is the relation of architecture to hygiene?" The difficulty of answering lies in the uncertainty as to the strict limits of the functions and duties of the architect. If we take the usual definition of architecture as "the art and science of building," its relations to the science of hygiene at once become too varied and too complex to admit of clear and concise description. A vast field is at once opened out before us, in which it is often extremely hard, sometimes even impossible, to indicate with precision the line of demarcation between the domain of the architect and those of experts in other branches of science. As one out of many illustrations which might be cited of this difficulty, I may mention the wide and interesting subject of paving, which plays so important a part in the health, comfort and well-being of communities. This large question seems to occupy a kind of neutral ground between the province of the architect and that of the civil engineer. Many other similar instances might be given, but this one will be sufficient to show that the selection of subjects to be dealt with by this section must always be a matter of considerable difficulty. Directly scientific considerations are admitted side by side with the purely æsthetic aspect of architecture, it becomes hard to name a subject for discussion at a congress of hygiene which would not be as suitable for an engineering, medical or other scientific section as it is for that of architecture. For this reason I venture to throw out the suggestion that for some future meeting of this congress an extremely interesting and instructive paper might be written dealing exclusively with the points of contact between hygiene and the purely æsthetic side of architecture. This branch of a great subject remains up to the present time practically almost untouched, perhaps partly from the fact that to many minds the attempt to establish any such relationship appears fanciful and impractical. It is well known that one of the greatest of our English pioneers of sanitary science, the late Sir Edwin Chadwick, viewed the idea of any such connection with disfavour, and even with anger ; he seemed, indeed, to think that art and hygiene were not only unconnected, but even in some respects incompatible. Notwithstanding this decided opinion of a great and deservedly respected authority, I do not think it would be difficult to show that such a connection has, at any rate for certain minds and constitutions, a very real existence ; neither would it be hard to prove that, although never perhaps closely followed up or fully worked out in all its bearings, the idea of some actual relation between beautiful and artistic surroundings and health must have been present in the minds of many writers, both ancient and modern. Valuable hints and suggestions bearing on this subject may be gathered from a lecture delivered many years ago at the Royal Institution by Cardinal Wiseman, entitled "Points of Contact between Science and Art." Also from an address delivered by Mr. Wyke Bayliss, president of the Royal Society of British Artists, "On Sanitary Reform in Relation to the Fine Arts," at the Sanitary Congress held at Hastings in 1889. As might naturally be expected from such a source, it teems with beautiful and poetical thoughts bearing on the subject. But the illustrations, arguments and advice made use of are directed more to the influence of sanitary reform on the growth and development of art than to the effect of art on health—a more obscure, perhaps, but no less interesting subject, and the one I desire to see dealt with. Some years ago my friend Dr. B. W. Richardson, who stands in the foremost ranks of sanitary authorities, delivered a lecture upon it. He began by showing that much prejudice had been excited against some of the best sanitary inventions and labours, because leading sanitarians have failed to consider artistic construction as part of sanitary construction ; their whole minds have been absorbed in the useful, and they have permitted all that is ornamental to pass by, as if good taste were disconnected from sanitation. He argued that this was a grand mistake ; that ugliness was an offence to good health, and that beauty was an aid to the best health. He showed that when mind and body are enfeebled by bad health the introduction of disagreeable objects into the sick room or ward is painful and injurious to the occupants ; whilst the presence of beautiful flowers, pictures and designs is curative in its effects—a kind of mental tonic which gives tone also to the body. This thought led him to the consideration of the best forms for hospital wards having regard to the effect on the eye, and through the eye on mental and bodily health, and so with all the details of visible construction and of decoration. Speaking of the dwelling-house, he maintained that no part ought to be excluded from the possession of architectural art, because it is the tendency of the human mind to let that which is disagreeable, plain and ugly go without regard, and accumulate dirt and disorder. Hence all the offices of a house should have as much care bestowed on them as the living rooms to render them bright and cheerful, and to make cleanliness as obvious a necessity in one as the other. In this lecture Dr. Richardson made a great point of the treatment of floors, adverting particularly to the ancient Roman mosaic floors, which were not only beautiful works of art, but easily cleaned, and by the well-known hypocaust system of warming diffused an equable and agreeable warmth through the room, without draughts. Other points especially dwelt upon were the treatment of roofs and the introduction of artistic water fountains in different parts of the house. No one could be found better qualified than Dr. Richardson to speak with authority on both the æsthetic and the scientific aspects of the question, "What is the relation of architecture to hygiene?" but even when writing in the interests of art he is naturally first of all a man of science, and I should like to see the same subject dealt with by an architect from an artist's point of view.

RESPONSIBILITY FOR VALUATIONS.

ON Tuesday Lord Justice Fry delivered judgment in Vennell *v.* Meakin, an action which raised questions of considerable interest to surveyors and valuers. It was brought by a gentleman who in July 1889 advanced a sum of 500*l.* upon the security of a second mortgage of some houses at Carshalton. The defendant was Mr. Frederick Meakin, a surveyor carrying on business in the City of London under the style or firm of W. F. Meakin & Son. He valued the property in question prior to the making of the advance, and, as the plaintiff alleged, with a view thereto.

According to the *Times* report, the plaintiff claimed compensation from the defendant by way of damages for loss sustained by the plaintiff in consequence of the property being proved to be an insufficient security, "by reason" (as the plaintiff alleged) "of the negligence, want of skill, breach of duty, and misrepresentation of the defendant with reference to a valuation and report" made by him. The property in question consisted of nine houses called Alexandra Terrace, in Stanley Road, Carshalton, which belonged to Mr. T. N. Ward, and there was evidence that the property was known in the neighbourhood as "Jerusalem" or "Abraham's bosom." Seven of the houses (those numbered 1 to 7) were subject to a prior mortgage for 1,500*l.* to a Mr. Coatt. The negotiations which led to the making of the plaintiff's advance were conducted through his then solicitors, Messrs. Sole, Turner & Knight, who employed the defendant to value the property. He had on April 20, 1889, on the occasion of the former mortgage, made a report and valuation as regarded the houses Nos. 1 to 7. This report was sent by Messrs. Sole & Co. to the plaintiff for his perusal. In this report the defendant said, "In obedience to your instructions we have made a survey of Nos. 1 to 7, which

are offered as security for a loan by way of mortgage, and beg to report as follows." The report stated that "the property is leasehold, for a term of ninety-nine years from March 1888, subject to a ground-rent of 7*l.* each house." The report gave a detailed description of the houses, stating (*inter alia*), "No. 1 is let on a three years' agreement, at 35*l.* per annum for the house and 15*l.* for the shop, to Mr. Collard. Mr. Ward offers all the other houses at 35*l.* per annum each, and at such rentals he should be able to let them readily, since they are in a nice position, within a mile of the station. . . . We understand Mr. Ward has arranged with tenants for some of the other houses. . . . So far as we can see, this part of Carshalton is evidently on the improve by the number of houses which have recently been erected in the immediate neighbourhood. Our valuation of the houses is equal to 2,600*l.*" On July 9, 1889, Messrs. Sole & Co. wrote to the defendant as follows:—"Referring to your report of April 20 last, and to our recent interview with you in reference to a further advance upon this property, we write to say that we have found a client who is willing to lend 500*l.* more (as required by Mr. Ward) upon the security of a first mortgage of 8 and 9 Alexandra Terrace, and a second charge on Nos. 1 to 7, provided you can report to us that it is a sufficient security. Having regard to the amount at which you value the seven houses, which are in mortgage to Mr. Coatt, it looks as if you would be able to advise the advance, although we hear that Nos. 8 and 9 are both still empty. We do not know whether you will require to go down to Carshalton again, but if so, perhaps you had better communicate with Mr. Ward, otherwise kindly send us a supplementary report at your earliest convenience." On July 12, 1889, the defendant sent to Messrs. Sole & Co. a further valuation and report, in which he said:—"When we made our survey in April last we viewed the whole of the terrace, and had Mr. Ward's instructions to take as many as we thought right to do for the security of the 1,500*l.*, he, however, offering Nos. 1 to 5, both inclusive. We, as you will remember, included under this charge Nos. 1 to 7, both inclusive, which we valued at 2,600*l.*, and our valuation of Nos. 8 and 9 (all the houses being similar, save No. 1, which has a shop in front) we estimate at 690*l.* This, taking the whole terrace as equal to 3,290*l.*, and allowing the usual two-thirds, would allow of a further sum of 500*l.* being advanced." This further valuation and report was communicated by Messrs. Sole & Co. to the plaintiff, and, in reliance (as he alleged) on the accuracy of the statements and estimate of value therein contained, he advanced to Ward a sum of 500*l.* on the security of a mortgage dated July 26, 1889, of the nine houses, subject as to Nos. 1 to 7 to the prior mortgage for 1,500*l.* The security has proved to be of little or no value. The plaintiff has received nothing in respect of his security except one half-year's interest, and Ward has become bankrupt. The plaintiff had also been obliged to pay considerable sums for ground-rent and insurance. By his statement of claim the plaintiff made allegations to the following effect. In making the further valuation and report the defendant had express notice, and was well aware that the same was required for the purposes of a proposed advance, and in order to enable the plaintiff, as the intending mortgagee, to determine whether he should advance any (and what) sum on the security of the premises, and that the valuation and report of April 20 had been, or would be, communicated to the plaintiff as such intending mortgagee, and the defendant made the further valuation and report, intending that the same should be communicated to, and that it and the former valuation and report should be acted upon by, the plaintiff as such intending mortgagee. Under these circumstances it was the duty of the defendant to use, and he in fact contracted with the plaintiff to use, due and proper care, skill and diligence in making the valuations and reports. The defendant knew, or without gross negligence must have known, that the premises were not worth 3,290*l.*, or anything like that sum, and the defendant in making the valuations and reports did not use due and proper care, skill and diligence, but the statements therein respectively contained were either false to the knowledge of the defendant or were made recklessly, without caring whether they were true or false, and in breach of his duty to the plaintiff. The plaintiff had been advised that if the premises were now put up for sale they would probably not realise more than 500*l.* altogether. The plaintiff further alleged that the original valuation and report contained serious misrepresentations of fact, in addition to the excessive estimate of value. The report did not state (as the fact was) that the houses were erected upwards of fifteen years prior to the date of the leases. The houses were not "fairly built," but were in fact very badly built, and were at the date of the report in a most ruinous and dilapidated condition. No. 1 was at the date of the report let to Mr. Collard on a parol weekly tenancy, at a rent of 10*s.* per week, and not on a three years' agreement at the rents in the report mentioned. None of the other houses had been let since and for many years prior to the date of the mortgage. The position of the property was not a "nice" one, as stated in the report, but was in the middle of ploughed fields, and out of seventy-two dwelling-houses in the immediate neighbourhood not more than half a dozen were let. There were no first-class houses in the immediate neighbourhood. By his defence the defendant denied most of the plaintiff's allegations. He denied that the plaintiff advanced the 500*l.* in reliance upon the reports, or either of them. The defendant denied that in making the further report and valuation he had express notice, and was well aware that the same was required for the purpose of a proposed advance, and to enable the plaintiff, as the intending mortgagee, to determine whether he should advance any, and what, sum on the security of the premises, or that the valuation and report of April 20, 1889, had been, or would be, communicated to the plaintiff as such intending mortgagee. The defendant denied that he made the alleged further valuation and report intending that the same should be communicated to, and that it and the valuation and report of April 20, 1889, should be acted upon by, the plaintiff as such intending mortgagee, as aforesaid. The defendant denied that it was his duty to the plaintiff under the alleged circumstances, or at all, to use, or that he in fact contracted and agreed with the plaintiff to use care, skill and diligence in making the valuations and reports. The defendant further said that he did in fact use due and proper care, skill and diligence in making the several valuations and reports, and that the statements made by him in the valuations and reports were true, and that he made the same with due skill and *bonâ fide* believing the same to be true. The defendant denied that the original valuation and report contained serious or any misrepresentations of fact; that as to the particular misrepresentations referred to in the statement of claim, he made the same after inquiry and upon information received, and *bonâ fide* and without negligence, believing them to be true. The defendant further said that if any of the representations so made were incorrect, the plaintiff himself or by his solicitors had possession of the title-deeds and other documents and information relating to the premises, and knew, or ought to have known, the correctness of such representations, and that, with regard to any such representations, neither the plaintiff nor his solicitors ought to have relied, or did in fact rely, on such representations.

Lord Justice Fry, after fully stating the facts of the case, and reading and commenting upon the correspondence and the two reports of April and July, 1889, made by the defendant, said that the first question to be decided was whether the plaintiff did employ the defendant to make the valuation. As to that question, his lordship was of opinion on the facts of the case that the defendant was engaged to advise the mortgagee and not the mortgagor. There was nothing to show that he was to advise the mortgagor. He knew that a person was desirous of making an advance on the property, and he was expected to advise that person as to the value of the security offered. His lordship therefore held that there was such a contractual relation between the plaintiff and the defendant in this case as that, if the tables had been turned, the defendant could have claimed from the plaintiff a reasonable fee for having performed the work for him. The second question was whether the defendant had negligently performed the work which he had undertaken to do for the plaintiff. Was there negligence on the part of the defendant in the way in which he had performed his duties? It was impossible to separate the two reports which the defendant had made, because the report of July was supplemental to the report of April. The history of the property was this. (His lordship discussed the facts relating to the property.) There was a colony of houses lying out in the open fields in a decaying and dilapidated condition. For ten years down to 1889, with the exception of the house at the end of the terrace, not a single house had been let. For more than ten years the other houses in the terrace had been entirely unoccupied. When the defendant visited the property in April 1889 he saw the condition in which the houses were, and he made the report of that date. It was not in dispute that that report proceeded on the footing of the houses being likely to let at 35*l.* per annum each. He must have known, however, that unless the houses were put into repair not a single one of them would be occupied. The question was, Were they likely to let? It was useless to estimate the rental unless it was possible to obtain tenants to occupy the houses and pay the rents. It ought to have put the defendant on his guard and led him to inquire into that point, to ascertain whether there was any probability of the houses being taken. The defendant ought to have addressed himself to that. But he did not do so. He assumed that the rent of each house would be 35*l.*, notwithstanding that the houses had been empty for ten years, and were still empty when he made his report. No one would take the houses in their dilapidated condition. His lordship did not think that the defendant was actuated by any improper motive in what he did. It was rather for what he did not do that he was to blame. It was his want of vigilance in the matter that was to be complained of. His lordship did not think that any person ought to have seen those houses, and not made inquiry and pressed for information concerning them. His lordship thought that the defendant had not done all that he

could have done. Then came the report of July 1889. It appeared to his lordship that the advice given by the defendant in April 1889, was given in expectation that the houses would let later on. But July came round, and still the houses had not let. Were not these important facts for a prudent surveyor to consider when he was advising that money should be advanced on those houses? In July the defendant did not go to Carshalton again to see the property. He did not deem it necessary to make any inquiry whether any of the houses had let since he visited the place in the preceding April. His lordship thought, therefore, that there had been decided negligence on the part of the defendant, but not more than negligence. The result was that the plaintiff was entitled to be repaid the 500*l.* which he had advanced on the faith of the defendant's reports, together with the unpaid interest on the mortgage, amounting to 37*l.* 10*s.*, and the costs of the action. On the defendant undertaking to pay those sums within ten days the order would not be drawn up until October, when there would be liberty to apply to his lordship before the order was drawn up on the question whether there should not be instead an account as between mortgagor and mortgagee, and the defendant to have a transfer of the mortgage.

THE ROYAL ARCHÆOLOGICAL INSTITUTE.

THE annual meeting of the Royal Archæological Institute of Great Britain and Ireland was opened in Edinburgh on Tuesday. Earl Percy, president of the Institute, took the chair, and congratulated the members on their meeting in Edinburgh. He said he came from a part of the country from which visits to Scotland in former times were not infrequently made, and they had had no cause to complain of the warmth of their welcome. He had peculiar pleasure in heading another inroad into Scotland in happier times, when his followers desired to carry away nothing but what their hosts were only too willing and able to give—gratification and instruction from the expeditions which they were to join during the week. In vacating the chair in favour of Sir Herbert Maxwell, he paid a high compliment to his researches in archæology.

Sir Herbert Maxwell, on taking the chair, thanked the Institute for the honour they had done him. The closing years of a century, he said, naturally suggested the process of stock-taking, and as they had arrived at the last decade of a century which claimed to have witnessed beyond all precedent the accumulation of scientific knowledge, it was not unnatural that they should direct inquiry into the standing obtained by that particular branch of science in which they were all concerned. The comparison was made the more easy by a landmark placed halfway nearly between the two periods—the present time and a century ago—viz. the last meeting of the Institute in Edinburgh in 1854. In making the comparison they had no reason to blush. It was in the year 1816 that the third of the Waverley novels, "The Antiquary," was published, in which the antiquary of the time was sympathetically delineated. No one had ever shared more keenly the ardour of collection and investigation than had Sir Walter Scott. It was not uninteresting to compare the motives of two men who, although vastly dissimilar in many points of their character, yet coincided in others. Sir Horace Walpole left the scene just as Sir Walter Scott entered upon it. Walpole collected antiquities because of their beauty. In his eyes art gave the primary merit, and association only the secondary. Scott, on the other hand, prized each object chiefly on account of its origin and the associations connected with it. Each was pre-eminent in his way—Walpole as a *dilettante* and Scott as an antiquary; and it was their privilege in the present day to follow a higher aim than either Walpole or Scott—the attainment of the truth. Without that object the whole science and scheme of archæology was a nameless fabric. The Scottish antiquaries had collected within the building a whole host of silent witnesses of the past which bore testimony to the origin of their race and the development of their civilisation. It was neither for the gratification of taste nor from romantic considerations that that collection was brought together. It was their desire to know and understand the past history of their race, without which it was impossible either to understand or control the present or to forecast and direct the future. He did not depreciate the work done by Sir Walter Scott. He yielded to no one in his love for the man and in admiration for his work. It was impossible to calculate how many minds he had drawn into the field of archæology, but the impetus which he had given to it would have been but transient had it not been submitted to the method and system which were found indispensable to all science, namely, the comparative method which distinguished modern science from Mediæval study. There was implanted in the human breast that craving for knowledge which, showing itself in the savage by a restless curiosity, swelled under civilisation and culture for the truth and a divine hatred of error. He had always held archæology was the handmaid of history, that it was an important branch of not the least important section of physical science, anthropology. More than anything else, it convinced them of the unity of the human race. Primitive instruments, primitive dwellings, burial places and utensils in all parts of the world bore a striking similarity to one another. Everywhere there was evidence that man in his primitive condition, subjected to similar circumstances, and having to contend with similar difficulties, had adopted similar means to overcome them. It was not only to tickle their vanity that they compared the water canoe, found perhaps in a Highland lake and hollowed out of a single oak trunk, with the modern ironclad. It tended rather to their humility when they reflected that between these two masterpieces of naval engineering there was perhaps interposed a space of twenty centuries. Sir Herbert then dwelt on the importance of collectors labelling at once every object with the name of the place where it was found, and, in impressing upon antiquaries not to disregard local traditions, he stated how St. Ninian's Cave, on the shore of Luce Bay, had been ascertained to have been a place of religious occupation fourteen and half centuries after its occupation by St. Ninian simply by local inquiries made to ascertain the truth of the legend. It would, he said, go far to free antiquaries from the ridicule and good-natured contempt which business people sometimes exhibited towards them if they were seriously to inquire into these traditions, discarding what was false and confirming what was true. One of the problems which was pressing upon antiquaries in several parts of the country at the present time was that relating to those mysterious rock sculptures which from time to time were found in increasing numbers all over Scotland. They bore a striking resemblance to similar rock sculptures found not only in Scandinavia and Central Europe, but in such remote parts of the earth as Asia, and Northern, Central and Southern America. They could hazard no guess even at the race by whom they were made, still less at the object of their authors. All they could do was to record the discovery of them with careful drawings, and wait till perhaps light would flash upon them from the habit of some uncivilised tribe or from a passage in some hitherto unnoticed writer. In conclusion, Sir Herbert explained to the Congress the circumstances under which the Antiquarian Society came to have its museum in the building, and in the name of the Society and of the Scottish nation he offered to Mr. John R. Findlay their grateful thanks for his munificence.

Dr. John Evans moved a vote of thanks to Sir Herbert Maxwell for his address, and expressed on behalf of the Institute and of the English nation their gratitude to Mr. Findlay.

In the afternoon the members visited Holyrood Palace, under the guidance of Mr. W. W. Robertson, of Her Majesty's Board of Works.

GREEK SCULPTURES.

A CORRESPONDENT of the *Manchester Guardian* writes:—An interesting discovery is reported from Athens. In the works connected with the extension of the Athens-Piræus Railway a few months back there was found at a spot north-east of the Theseion a square block of Parian marble, which had formed the base of some dedication. On the front is an inscription recording as follows:—"In the cavalry sham fight these commanders of squadrons (*Phylarchi*) won: Demainetos, son of Demeas; Demeas, son of Demainetos; Demosthenes, son of Demainetos. All of the deme Paianieus. Bryaxis made me." On each of the three remaining sides is sculptured in relief a tripod and a bearded horseman. Judging from the remains on the upper surface, this base seems to have supported a small Ionic column, on which probably stood the tripod of bronze or silver which commemorated the victory. This has of course perished, but in the reliefs on the base we are fully warranted in recognising the work of Bryaxis's own hands. It was a regular practice among the great Greek sculptors to decorate their own bases, and moreover the excellence of the work fully justifies this attribution here. The discovery is the more important because nothing has hitherto come down to us which could be definitely connected with this celebrated artist. That his reputation as a sculptor was considerable we know from the general testimony of antiquity, and also from the fact that he was chosen with Skopas and Leochares to decorate the mausoleum at Halicarnassus. Bryaxis was an Athenian, but, judging from the record of his works, must have spent much of his life in Asia, as we hear of him at Rhodes, Knidos, Antioch and Patara in Lycia. In all probability, then, his work at Athens must have taken place before his work on the mausoleum—that is to say, shortly before 350 B.C., and this date would suit the characters of the inscription and the style of the sculpture. The three horsemen are evidently portraits of the Phylarchi whose names are recorded; one figure seems to be older than the others, and is probably intended to represent Demainetos, the father of Demeas and Demosthenes. The formation of these three

names recalls a practice familiar to the Greeks of the best period, in which the family names usually ring the changes on one or two compounds of words. Here the names are all compounded with Demos. One is naturally reminded of the fact that the great Athenian orator was Demosthenes, son of Demosthenes, and belonged to the same deme Paianieus. If the sculpture of Bryaxis is correctly attributed to about 355 B.C., the orator must have been when this was executed exactly thirty years old, and may very likely have witnessed the cavalry manœuvres in which his relations were successful.

MANCHESTER ARCHITECTURAL ASSOCIATION.

ON Saturday, the 8th inst., about forty members and friends visited the Jesse Haworth Memorial Church, recently built and endowed at Walshaw, near Bury, in Lancashire, by the sister and nephew of the deceased gentleman whose name it bears, who, during a long life, was the centre of a homely and successful industrial community. A more detailed description of the edifice is reserved until nearer the date of consecration. Its exceptional features are the thoroughness with which every part of the structure has been carried out in the most durable materials, and the large amount of memorial glass of excellent quality by which the interior is adorned. Mr. Arthur J. Dix, of London, is responsible for the east window of chancel, and Messrs. Cakebread, Robey & Co., of London, for the two side-windows of chancel. Mr. William Pape, of Leeds, has executed the large west window of seven lights, the north transept window of four lights and three nave windows of three lights, and is engaged on two others for the main porch. The windows have been erected by members of the Haworth family and others, and were greatly admired by the members of the Association. They are part of a complete scheme laid down by the architects for the illustration of the birth, life, death, resurrection and ascension of Our Lord, to whom the church is dedicated, and of his works and parables. The church was designed by Mr. L. Booth, F.R.I.B.A., and has been carried into execution under the supervision of Messrs. Booth & Chadwick, of Manchester. After the inspection the visitors were invited to tea at the Derby Hotel by Mr. and Mrs. Booth, and an agreeable evening was spent.

PALESTINE EXPLORATION.

THE annual report of the general committee of the Palestine Exploration Fund states that the main work of the past year has been the excavations at Tell el Hesy. Some delay occurred in resuming the work. Mr. Flinders Petrie's old love for Egypt was so strong that the committee had to look afield for a fresh explorer. It was no easy matter to find one suitable, so many qualifications combined in one man are necessary. Mr. Bliss, the son of the president of the American College at Beirout, being highly recommended by the Rev. Dr. Post for the position, was appointed, and proceeded to Egypt, where he underwent a course of instructions with Mr. Petrie in conducting excavations. In February he arrived at Jaffa, and at once began arrangements for starting work.

Herr Schick continues to report on all newly-discovered objects in or near Jerusalem. His endeavours to find the continuation of the rock-cut channel south of the Virgin's Fountain were at last rewarded by success, though not before sinking several shafts over 30 feet in depth. On striking the channel, which is partly a rock-cut tunnel, he followed it for over 200 feet. What this channel or drain belongs to, or where it comes from or leads to, has not yet been decided. Unfortunately, the work was put a stop to by order of the Governor, owing, it is thought, to the lamentable removal of the Siloam inscription, which has roused the suspicions of the Turkish authorities. Every one interested in the archæology of Palestine will have learned with regret that this famous inscription was cut out of the rock tunnel and carried away some time during last year. It was broken in removal, and the fragments sold to a person in Jerusalem. On receiving this intelligence the executive committee immediately forwarded to his Excellency Hamdi Bey a resolution expressing their regret and their hope that steps would be taken to secure the fragments. A few weeks later Mr. Kayat, Acting British Consul at Jerusalem, reported that through his endeavours the inscription had been recovered and handed over to the Turkish authorities for transmission to Constantinople. About the time of the removal of this inscription another "Siloam inscription" was produced, and copies of it sent to several persons. It is a clumsy forgery in seven lines of Phœnician characters.

Among the more important discoveries of the year are:—An elaborate rock-cut tomb, and an ancient bath and cistern near Bethany. Some fine mosaic work in three colours at the so-called "House of Caiaphas." Another rock-hewn chapel with a Greek inscription at Silwân. The springing of an arch in "Solomon's Stables" by Mr. Lees. The lower masonry and the part of the arch left are similar to Robinson's Arch, and the fragment of an arch near the south-east corner. Herr Schick and Mr. Lees sent some squeezes and tracings of Hebrew inscriptions and ornamentation found on some ossuaries that were deposited in rock-hewn tombs lately opened up north of the city, on the west side of the Damascus road. These were forwarded to Professor Clermont-Ganneau, who has contributed valuable notes respecting them.

Herr Schumacher, acting on instructions from the committee, proceeded to Kana, a village east of Tyre, and photographed and examined the sculptured figures mentioned by Guérin and Renan. No inscriptions were found. Major Conder believes the figures to be of the Roman or Greek period.

BARRY'S PUBLIC BUILDINGS IN LONDON.

THE latest number of the *Edinburgh Review* contains an elaborate article on "London Architecture in the Nineteenth Century," which is sufficiently comprehensive to serve as a guide to strangers in search of modern work. The change in architecture is traced from the beginning of the century. The following extract relating to some of Sir Charles Barry's work at Westminster will suggest the competence of the writer to treat of architecture:—

In our notes on the new architectural era of London, we cannot commence better than by retracing our steps to Westminster and considering the architecture of the most important and celebrated building of modern London. It was on the night of October 16, 1834, that Charles Barry, already known to many as an architect of exceptional ability, but who had not then achieved any very extended fame, was returning from a professional visit in the country, when he saw the glare in the sky indicative of a great fire. He hurried to the place, and remained the whole night watching the burning of the Houses of Parliament, perhaps not without dreams of what he might produce to replace them. An official rebuilding was at first all that was thought of, and Sir Robert Smirke had even been desired to make plans for this; but the strong public feeling that this was a great opportunity prevailed, and eventually, in June 1835, a committee of the House of Lords settled the terms of a competition, allowing only six months for maturing the designs, and ruling that the style of the proposed building was to be "Gothic or Elizabethan." No fewer than ninety-seven designs were sent in, and for all those who went into it with a serious intent to be winners the labour and mental strain in producing an adequate plan and design within the time allotted must have been enormous, as in Barry's case we know that it was. After some delay his design, which had attracted much notice from competent judges from the first, was definitely adopted. As everyone knows, Barry had selected the style of Late Gothic prevalent in the reign of Henry VII. in preference to the mixed style connected with the name of Elizabeth, in which the last relics of Gothic are blended with the rising spirit of Renaissance detail, and as one or other style was forced upon him, there is no doubt he did wisely in selecting for such a building that which was still a complete style, coherent in all its details. However well the picturesque quality of Elizabethan architecture may be adapted to a private mansion, it wants the elements of breadth and consistency requisite for the dignity of a great public edifice. Had Barry been left free to do as he liked in regard to the architectural treatment of the Houses of Parliament, there cannot be a doubt that he would have based his design on the Renaissance style, and that, working in accordance with his own special gifts and architectural sympathies, he would have produced a much finer building, and one more in keeping with the spirit and with the practical requirements of the present day.

Even as it stands, however, London may well be proud both of the building and of its architect, who was a Londoner, and born in Westminster (in 1795) on a spot close to the site on which he was afterwards to rear the structure with which his name will always be connected. Barry was one of those men who may be said to have been a born architect, gifted with that peculiar faculty for perceiving what can be made of a site and of a plan, both in a practical and artistic sense, which is something quite distinct from the mere production of pictorial architecture. He was the only architect who has risen to fame in modern England who combined in an equal degree practical knowledge and ability with artistic perception. He was a master of planning; he disdained no practical details, and he had that delicate perception of proportion and refinement in design which enabled him to leave the stamp of architectural grace and dignity upon everything he touched. In regard to the Houses of Parliament, the character of the detail was fixed for him more or less by the style adopted, and had he chosen his own style we should no doubt have had a building less florid in detail, and with more of the effect obtainable from the con-

trast of decorated with undecorated wall-surface. As it is, no doubt, the building is over-rich in detail. Apart from this, there is little but praise to be given to the building. Its low position is unfortunate, but for that also the architect was probably not entirely responsible.

It is characteristic of Barry that the finest architectural thought in it should be expressed in the plan, in the idea of the four main corridors, at right angles to one another, and meeting in the central octagon, the position of which is externally expressed by the graceful central lantern. It was another fine architectural thought to place the two towers at the extreme ends of the structure, the extent of which is thus marked out from a distance when the rest of the building cannot be seen; nor was Barry less happy in his characteristic treatment of the two towers—the one purely a State ceremonial tower, marking the royal entrance, and therefore treated as a piece of architectural effect merely; the other a utilitarian tower intended to carry a great clock, and designed so as to express that function. This distinction, which would seem so obvious, and is so truly architectural in spirit, seems, however, to be beyond the comprehension of some people. If Barry had made the two towers similar and balancing each other symmetrically, he would have taken away half the character of the whole group of building.

The removal of Soane's Law Courts from the west side of Westminster Hall a few years ago exposed to view an unsightly and much patched-up wall, and the flying buttresses in a very dilapidated state, together with a certain portion of the original Norman masonry of the Hall, about which a somewhat disproportionate excitement was got up, in accordance with the modern feeling, which is too much disposed to make a fetish of any bit of ancient work, however plain and uninteresting in itself. It was impossible to leave the building in the state in which it was found when uncovered, and the discovery of some traces of the former existence of a double-storeyed cloister between the buttresses furnished an excuse for a so-called "restoration" of this feature; the first motive of which, from Mr. Pearson's report to the First Commissioner of Works, evidently was to find a means of covering in and preserving the fragment of Norman wall. As this was obviously a most abnormal project for such an object, it was claimed in favour of the scheme that rooms could be formed between the buttresses which would be of use as committee-rooms; thus inverting the true order of architectural procedure, which is to provide for ascertained requirements on a definite plan, not to erect an apparently useless structure and then find a use for it afterwards. The subject was discussed at great length by a special commission composed of men who had mostly no knowledge of architecture, the one or two who did know anything of the subject being entirely opposed to the scheme, but hopelessly in the minority. The result has answered only too well the expectations of those who understood best what it was which was proposed. The "restoration" of the cloisters is no restoration at all in the strict sense, as there were really no data for anything beyond a general conclusion that something of the kind was formerly there; and, even if there were, the mere building up again or "restoring" an ancient piece of architecture because it once existed is an absurdity; a modern imitation is not the ancient thing and has not the slightest archæological value. The rooms are found, as might have been expected, to be inconvenient and cramped in themselves and inconvenient of access, and the area of Westminster Hall has been spoiled by the obtrusion of two staircases adorned with gimcrack heraldic animals, the sight of which raised a storm of derision from members of the House of Commons who had sense enough to see the absurdity, when completed, of a scheme which they might have prevented had they troubled themselves to ascertain its merits beforehand, instead of protesting when it was too late. It should be mentioned that Barry's original intention was to have carried out a further extension of the Houses of Parliament in two blocks of building surrounding the space east and north of Westminster Hall, which would have provided committee-rooms and other accommodation for all possible future requirements, and he left plans for this addition which are still in existence, and which it may some day be absolutely necessary to carry out. The side of Westminster Hall would then have been blocked out from exterior view, as in all probability (on the evidence of old plans and drawings) it always was; and Barry would have met the difficulty by refacing it in such a manner as to carry on the design of his courtyard. To many sentimental persons in the present day this would seem absolute desecration, but it is what any Mediæval architect would have done in a similar case without hesitation. The exaggerated reverence for every bit of old building is entirely a growth of the present generation, and merely means that architecture is a dead and not a living art now.

The next important public building after the Houses of Parliament was the Government offices, the great block extending from Parliament Street to St. James's Park. This and the new Admiralty building, at present in progress, have a relation to each other not generally surmised; they are the *disjecta membra* of what was once a great scheme, worthy of the nation, and which has gone through stages of successive decline. Barry drew out, and exhibited in Westminster Hall in 1857, a really grand plan for the concentration of the whole of the Government offices in one vast building or group of buildings, to extend from Great George Street nearly to the Horse Guards, and to have fronts towards Whitehall and St. James's Park. The present block of the Privy Council buildings was to be utilised (architecturally speaking) as the northern wing of the Whitehall façade, and a similar wing to be formed abutting on the east end of Great George Street, the houses east of King Street being abolished, and the wide roadway of Whitehall carried through. Between these two wings the central line of building was to be thrown back somewhat, and through the centre of it was to be a grand gateway or covered way leading into a great colonnaded central hall or court, a parallelogram with its longer axis running east and west, and an opening at the further end into St. James's Park. On the south side of the block would have been a grand façade to Great George Street; on the north side the façade towards the parade-ground was to be laid out so as to be at right angles with the line of the Horse Guards, which was to be architecturally connected with the whole scheme, and on the north side of the parade-ground a façade (for Admiralty extension) was to be formed facing that on the south of the parade-ground, leaving the latter a symmetrical parallelogram with the Horse Guards in the centre of its eastern side and a central gate into St. James's Park facing it on the western side. The vast new building was to be laid out around various interior quadrangles, around each of which would be grouped the offices of a special department. The Board of Trade would have been accommodated in the block balancing the existing Privy Council buildings, with the "Trade Office Court" in its rear; the Home Office and Foreign Office would have formed the two sides of the façade overlooking the park, with the "Home Office Court" and "Foreign Office Court" in their rear; the War Office would have formed the central block of the Park façade, returning along one side of the great central hall; and the same principle was to be carried out through other departments. All the Government offices would thus have been combined into one great architectural whole, in close relation with each other, and in the immediate neighbourhood of the Houses of Parliament. The houses on the southern side of Great George Street were to be pulled down, and the land between that street and the Abbey laid out as an ornamental garden. Thus Great George Street would have formed, along with Birdcage Walk, a kind of state road between the palace of the sovereign and the palace of the Legislature. The scheme included a wide road from the foot of the Haymarket through St. James's Park and past the end of Birdcage Walk to join the east end of Victoria Street—a road which would have been a great public convenience. That, however, was no essential part of the scheme; the main thing was the arrangement of the buildings, and it is rarely that an architectural project at once so practical and so grandiose has been proposed for any official buildings. It would no doubt have cost an immense sum of money, but it might have been carried out gradually and piece by piece, and when complete it would have been a thing for the nation to be proud of. It is melancholy now to look at the plan, and to reflect upon a great opportunity lost.

LOCAL ARCHÆOLOGY.

A MEETING of the Cumberland and Westmoreland Association was held last week at Maryport. The Bishop of Barrow-in-Furness presided, and addressed the members on the importance of local archæology. An educated man could hardly turn in such a country as ours without desiring to know something about the history and character of those who had lived here before him, and whose record he saw in their handiwork on every side. And these local antiquities had been to him a pleasant and wholesome "fad"—an interesting and useful relaxation from the more serious work of life. In the northern part of England there was much work to be done by persons interested in antiquarian subjects, because of the rapid changes which had taken place during the latter part of this century, or which were still in progress. Thus old words and modes of speech were passing rapidly away under the influence of educationists, who considered the language of a Cockney training college to be far superior to the good old tongue of Cumberland and Westmoreland. South countryman as he was himself by birth and education, he had no sympathy with a parent who told him exultingly concerning her children, "They take great pains with 'em; they're getten quite to speak with a south country twang." And if there were any other south countrymen there, let him urge them to make careful notes of phrases or turns of language (as well as words) to which their ears were unaccustomed, for after a time they would not be equally sensitive to them. Old customs, too, were rapidly passing away in consequence of increased intercourse between different parts of England. And in some districts enclosures

and extended cultivation and in others the growth of population had destroyed, and were destroying, the relics of ancient times. And although the larger and more conspicuous remains of antiquity were well-known, almost every district contained some which were hardly known beyond the immediate vicinity, but were not less worthy of study. Coming to the Roman period they found many important remains of that great people. The "Maiden Way" ran up the valley of the Lune, in one place on a high causeway over marshy ground, and it would be very desirable to trace it out in detail throughout its course. A large and important camp was situated about two miles from Kirkby Lonsdale; part of the ramparts might still be seen, and some capitals of pillars and other sculptured stones were preserved. He had in his possession a stone mortar said to have come from the camp, but it was too bulky to bring there that day. The Romans left Britain, but the native tribes retained some of the Roman civilisation, and possibly some submixture of Roman blood. Had they any relics of that period? Yes; two miles from Kirkby Lonsdale there were the remains of a British settlement, traces of huts and cattle-pens, surrounded by an earth bank. And the iron implement (a drawing of which the president exhibited), which he found in excavating the remains of a circular hut, fixed the date. That was one of a very destructive class of implements, called "hipposandals," about the use of which archæologists were not altogether agreed, but it was probably a peculiar kind of horseshoe. Only a few had been discovered in England and on the continent of Europe, but all those known had been found among remains of the late Roman civilisation. Therefore that implement fixed the date of the settlement in which it was found; it was about the time the Romans left Britain. To the Briton, who had received a certain varnish of civilisation from his Roman master, succeeded the stronger and ruder Saxon conqueror. All down the Lune valley the Saxons have left the earthen mounds which were their castle and homesteads; some, as in the vicarage grounds of Kirkby Lonsdale, a simple mound surmounted by a ditch; others on a larger scale, as at Burton-in-Lonsdale, an inner fortress for the lord and his household, an outer enclosure for the serfs and cattle. The Saxon came a heathen; before long the Church sought him out, and in this district, through Celtic missionaries from the North and West, converted him to Christianity. The earliest trace of Christianity in the Lune Valley was the rude stone cross at Barbon, specially interesting because it stands close to the old Roman road, and there was some reason to think that the stone was placed there as a heathen emblem, long before the cross was cut upon it to make it Christian. Once more came heathen invaders. The Danes forced their way up the valley of the Lune from Morecambe Bay, as they did into many other peaceful dales. Here was a trace of them. Some heathen Danish chief wore this silver brooch to fasten his plaid or cloak; and, as he went along the Roman road, the one highway then and for many centuries afterwards, death overtook him. It might have been from some sudden illness; it might, more probably, have been by the sword or arrow of one of the natives of the valley which he was plundering. But at all events, there he died, and was buried hard by the side of the Roman road some time in the tenth century; and 900 years afterwards his brooch was ploughed up, and then put away in a cupboard and forgotten for another 50 years, and then was just going to be sold for a few pence as old metal when happily, by a mere accident, attention was called to it, and its history was routed out. He told them this story now that they might realise the good of local archæological societies, which would keep alive the memory of such finds in their several localities. And then the Danes' children and grandchildren in their turn became Christians, and the name of Kirkby Lonsdale, the church tower of the Lune Valley, commemorates the change, and the foundation of a parish church. And then came the Normans again, and began to rebuild it; and each century from then till now had left its mark still legible upon the fabric. They had a Roman camp within a few hundred yards of that place, and in its immediate neighbourhood had been discovered perhaps the most remarkable collection of Roman altars which had ever been found in England. At Dearham and Crosscanonby churches were hog-backed tombstones and carved crosses of early Saxon times, when the Christianity of the English people was still isolated from that of southern Europe, and retained something both of the thought and of the art of their heathen forefathers. There were examples also of early Mediæval work in gravestones and in the fabrics of the churches themselves of the character of the neighbourhood in later Mediæval times. They had a most interesting illustration in the fortified church at Dearham, which was meant less for a belfry than to be a fortress for the parish. The fact that almost every old manor-house had grown, like Netherall, around an old peel tower was remarkable enough as an evidence of the unsettled state of the district three or four hundred years ago; but these fortress churches told the tale of Border frays in a more striking manner still. Let him, then, urge all members of that Association to interest themselves in observing and recording the antiquities of their own neighbourhood. The study would greatly increase their interest of the reading of history and the widening of their historical knowledge.

CHURCH BUILDING AND RESTORATION.

Ludlow.—Commemoration services have been held in St. Laurence's Church on occasion of the restoration of the tower, which has been carried out under the direction of Sir Arthur Blomfield. The tower walls have been strengthened wherever there were cracks or indications of weakness, and the exterior of the tower refaced. The whole of the decayed stone on the exterior has been cut out and replaced by new stones, but all stones in fairly good condition have been preserved. Eight sculptured figures have been placed on the four faces of the upper stage of the tower representing St. Laurence, St. Peter, St. George, St. Catherine, Edward IV., Edward the Confessor, St. John and St. Leonard. The work has been carried out by Mr. John Thompson, of Peterborough. The cost of the work is about 8,000*l.*

Shadworth.—St. Cuthbert's Church, Shadworth, Durham, has been reopened after restoration. The designs for the work were prepared by Messrs. Hicks and Charlwood, of Newcastle, and the work carried out by Messrs. Carse & Son, of Amble. The chancel of the church has practically been rebuilt, and a new vestry has been added. A lining of bricks has been put in the nave of the church, and new flooring has been put down, with a concrete aisle.

GENERAL.

The Death is announced of Mr. V. W. Voisey, F.R.I.B.A., at Bristol.

"**La Source**," one of the idyllic scenes of M. Puvis de Chavannes, has been sold to a collector in New York.

Mr. Copland, C.E., of Glasgow, has been commissioned to prepare plans for an increased water-supply for Kirkintilloch.

Mr. G. Wormal, architect, has prepared plans for the proposed new buildings and alterations at the Stafford workhouse. The plans provide for a new infirmary, separate fever wards, a new chapel, porter's lodge, &c., with various structural alterations in the present building.

Mr. Herbert Kirk, of Sleaford, was elected county surveyor at the meeting of the Kesteven County Council held at Grantham.

A Petition was presented at the meeting of the Court of Common Council, by Mr. Alderman Tyler, from Mrs. Peebles, widow of the late Mr. A. M. Peebles, the City Architect, for assistance; but a motion to dispense with the petitioner's personal attendance having been negatived, the consideration was postponed.

Mr. W. Oxtoby, of Hull, has been appointed borough surveyor of Beverley.

The Bath Town Council have decided to have an open competition for the proposed municipal buildings.

A New Lecture-hall and Offices for the principal are to be opened next month in connection with the Crystal Palace School of Practical Engineering.

The Paisley Authorities have approved of plans for the erection of a reception-house in New Sneddon Street, and for the carrying out of alterations in the Bladda Hospital, the cost of which will be about 2,000*l.*

Dunville Park, Belfast, an estate which Mr. R. G. Dunville has presented to the city, has just been opened by the Marquis of Dufferin and Ava. The park cost 13,500*l.*, and Lady W. Dunville has given 5,000*l.* to provide park-keeper's house, fountains, &c.

At the Meeting of the Carlisle County Council, a resolution to make safe a dangerous bridge—the Petteril Bridge—by erecting a lamp at each end was defeated in favour of an amendment to reconstruct the bridge. The cost of reconstructing and widening the bridge, it was stated, would cost at least 1,300*l.*

The Chairman of the Midland Railway Company, at the meeting just held, stated that since the accident on the Brighton line the engineer had made a further report on the condition of their bridges, and he had reported that there was everywhere a large margin for safety. It was, however, intended to proceed with the reconstruction of the 181 cast-iron bridges, upon which they proposed to expend 85,000*l.* in the present year.

At the last Meeting of the Lincoln Town Council a site was fixed on for the erection of municipal buildings. The Estates Committee was instructed to submit proposals with regard to the proposed new building to a future meeting of the Council, in order that instructions might be given for the preparation of plans.

The Architect.

THE WEEK.

On Saturday last the members of the Archæological Institute visited Glasgow Cathedral, which was described by Mr. John Honeyman, who has devoted much time to a study of the building. The peculiarity of the site on which the cathedral stands was said to have been probably determined by the fact that it was the traditional burial-place of St. Mungo, otherwise St. Kentigern, to whom the cathedral was dedicated. When in the lower church Mr. Honeyman remarked that it was a most terrible pity that that part of the edifice should have been ruined to such an extent by the recent introduction of stained glass into the windows. He did not believe they were ever intended for anything of the kind; and in this opinion Mr. Honeyman seemed to have the hearty sympathy of a large proportion of the visitors. The nave also contains many windows which are out of place in such a building. In the choir, Mr. Honeyman said the most striking architectural feature was undoubtedly the peculiar arrangement of the east end. It was at once noticeable from the fact that it necessitated the placing of a pier in the centre of the gable, so carrying round the main arcading of the choir as well as the aisles, while above there was the other peculiarity of a group of four lancets, instead of the more common grouping of three or five.

Although drains may not be the cause of diphtheria, still in all cases an outbreak should be made the occasion of a thorough investigation of the drainage system of the building in which the patient resides. The Corporation of London have set an example of the kind which is worthy of imitation. Shortly before Christmas a death occurred in the family of the head master of the Freemasons' Orphan School at Brixton. The sanitary authorities of Lambeth visited the building, which contains about two hundred children, and expressed their opinion that the system of drainage was seriously defective. An examination by these officials and the City surveyor (Mr. A. Murray) was made, the result being the decision that the system, which had existed for forty years, was not only entirely out of date, but so incomplete and inefficient as to constitute a serious source of danger to those living in the school. In these circumstances the Lambeth officials insisted on the whole of the drains being removed and new drains carried outside the building. The Corporation lost no time in taking action, and all the drains are now of an improved form and are adequate to the requirements of so large a building.

Among the subjects treated by Dr. W. Huggins, F.R.S., in his address as President of the meeting of the British Association at Cardiff on Wednesday, was the photographic chart of the heavens which this year was commenced. This great undertaking originated in an international conference which met in Paris in 1887, by the invitation of M. l'Amiral Mouchez, director of the Paris Observatory. The richness in stars down to the ninth magnitude of the photographs of the comet of 1882 taken at the Cape Observatory under the superintendence of Dr. Gill, and the remarkable star-charts of the Brothers Henry which followed two years later, astonished the astronomical world. The great excellence of these photographs, which was due mainly to the superiority of the gelatine plate, suggested to these astronomers a complete map of the sky, and a little later gave birth in the minds of the Paris astronomers to the grand enterprise of an international chart of the heavens. The actual beginning of the work this year is in no small degree due to the great energy and tact with which the director of the Paris Observatory has conducted the initial steps, through the many delicate and difficult questions which have unavoidably presented themselves in an undertaking which depends upon the harmonious working in common of many nationalities, and of no fewer than eighteen observatories in all parts of the world. The three years since 1887 have not been too long for the detailed organisation of this work, which has called for several elaborate preliminary investigations on special points in which our knowledge was insufficient, and which have been ably carried out by Professors Vogel and Bakhuyzen, Dr. Trépied, Dr. Scheiner, Dr. Gill, the Astronomer Royal and others. Time also was required for the construction of the new and special instruments. The decisions of the Conference in their final form provide for the construction of a great photographic chart of the heavens with exposures corresponding to forty minutes' exposure at Paris, which it is expected will reach down to stars of about the 14th magnitude. As each plate is to be limited to four square degrees, and as each star, to avoid possible errors, is to appear on two plates, over 22,000 photographs will be required. For the more accurate determination of the positions of the stars, a *réseau* with lines at distances of 5mm. apart is to be previously impressed by a faint light upon the plate, so that the image of the *réseau* will appear together with the images of the stars when the plate is developed. This great work will be divided, according to their latitudes, among eighteen observatories provided with similar instruments, though not necessarily constructed by the same maker. Those in the British dominions and at Tacubaya have been constructed by Sir Howard Grubb. Besides the plates to form the great chart, a second set of plates for a catalogue is to be taken, with a shorter exposure, which will give stars to the 11th magnitude only. These plates, by a recent decision of the Permanent Committee, are to be pushed on as actively as possible, though as far as may be practicable plates for the chart are to be taken concurrently. Photographing the plates for the catalogue is but the first step in this work, and only supplies the data for the elaborate measurements which have to be made, which are, however, less laborious than would be required for a similar catalogue without the aid of photography.

To the Americans English-speaking people are indebted for the dictionaries of Webster and Worcester, which have superseded Johnson's, and are made the basis of many of the later works published in this country. A new dictionary, of which Dr. Funk and Dr. Graham are editors, and Dr. March the consulting editor, is about to be issued by Messrs. Funk & Wagnalls, of New York. If we may estimate the whole work from an instalment, the "Standard Dictionary" will be considered to deserve its title. The different divisions of knowledge have been assigned to special editors, and never before have so many brains co-operated in the production of a single-volume dictionary. There are several peculiarities in the pages which facilitate reference and suggest the various relations of a subject. There is an abundance of illustrations, and a more useful book of reference for students of English, past and present, can hardly be found.

The French are liberal in providing bursaries for students of art, and it was always understood that the recipients would be careful to comply with the conditions, and especially with the principal one which prescribed residence abroad. It is not creditable to find students evading the rules by remaining all the time in France, and accordingly steps have been taken to prevent irregularities of the kind. Henceforth every winner of a bourse-de-voyage will only receive the instalments in a foreign town. If, for example, the prize is worth 4,000 frs., on departure from Paris 500 frs. will be paid to the student, and while he is abroad he will be remitted 300 frs. per month for ten months, the balance of 500 frs. being obtainable on his return to Paris. Should the student grow tired of exile and return to France before the time prescribed by the authorities, he will forfeit the sum remaining unpaid. It will be necessary for each student to inform the Department of the town in which he proposes to reside, and every month he will have to send a report to Paris describing the progress of his studies.

The *Victory*, which lies in Portsmouth Harbour, forms the subject of an interesting history and analysis by Captain Orde Browne and Mr. H. J. Webb, which is published at the office of the *Engineer*. The description of the timber-work reveals that scientific principles were followed in building up the framing, which resisted so well the impact of the French shot. Much of the timber is modern, but we suppose the new pieces were copies of those superseded.

THE SOUTH KENSINGTON COMPETITION.

LIMITED competitions have advantages, but they always excite less interest than those which are general. In the latter there is a chance for men who are unknown, and whenever they win, a sense of satisfaction prevails among good-natured people which it is a pleasure to experience. When the contest is between a few men, it is only partisans who can feel much excitement about the result. That is one reason why architects and the public have been indifferent about the result of the competition for the completion of the South Kensington Museum. Now that it has ended, people are likely to look upon the competition more seriously, for it seems to be inevitable that the new works will lead to the demolition and reconstruction of the greater part of the existing Museum. This conclusion will be more evident from a consideration of the character of the work which Sir Henry Cole inspired.

It is well to remember that in the days when he set about a reform as "Felix Summerley" he put more value on decoration than on form. His "art manufactures" were more striking from the ornament than from the contours. When he became supreme at South Kensington he acted on the same principle, and in the buildings construction became subservient to decoration. The upper part of the walls of one court he had filled in with figures in mosaic of artists, the architects being in the minority. The girders and ironwork were treated as if they were intended to be fields for most elaborate stencilling. Henry Cole knew that the British Museum, from the monumental character of its architecture, repelled visitors. Accordingly he took care to mask his building as much as was possible without the aid of tapestry hangings, and where a part could not be concealed he gave it a sort of festive character. He did not believe in severity of style or in ponderosity. Among the humbler classes he was eager to attract to his collections he knew there were many who resembled the father of Mrs. Plornish in "Little Dorrit," good folks who believed there was nothing in or out of the world to surpass a tea-garden. Henry Cole therefore preserved as much greenery as possible about his Museum, and used collections of ferns to give repose to eyes that at first were likely to be bored by Italian sculpture. His own portrait was rightly placed in a faïence frame in front of that ceramic gallery which he considered to be one of his triumphs. To create a gallery which East-End visitors would believe was all made of the same delph as the plates they employed was undoubtedly a triumph of showmanship. The material had also the advantage that it allowed chubby figures to appear without any stint on the columns or wherever they were likely to be most effective. Cole was well served. Fowke and Scott, as became disciplined officers, laboured with loyalty under his direction to provide opportunities for displaying the work of Godfrey Sykes and the staff of decorators, as well as the work of such painters as could be persuaded to contribute. Considered from the director's point of view the experiment was most successful. Crowds that avoided the British Museum as if it were a house of bondage found pleasure in journeying to South Kensington, where every object seemed to be set out for their gratification, and there can be no doubt that many were instructed by what they saw.

The contents of the Museum are as delightful as ever, but what about the casket that contains them? One test of all good work is that it becomes more admired as the mind grows in power, and that test the Museum cannot sustain. Those who could at one time appreciate the motives through which precedents were set aside in the erection of the building must feel that the lightness which is supposed to characterise the courts is only another term for meanness. As long as there is no standard with which the existing interior can be tested the defects may be passed over; but with an exterior and new courts having architectural style, the shortcomings of the Royal Engineers' work will become more manifest, and will plead for removal.

The architects who took part in the competition for the completion of the Museum buildings could hardly avoid the consideration of the fate of the parts which Henry Cole created. If the existing buildings are to be preserved, the additions ought to correspond with them. If, sooner or later, Cole's work is doomed to be swept away, there was no restriction as regards the style, and present-day ideas about suitability could be followed. The majority of the competitors have taken the latter view, but the carrying out of any of the designs would involve the transformation of the present courts. In a building of the kind it is necessary to exemplify unity and consistency if the system of art teaching is to be respected. Elsewhere there might be excuses accepted for vamping, but at South Kensington the Museum ought to be entire and perfect as any of the works which it holds. If Henry Cole were alive, he would tolerate no departure from the principle he adopted. The decorator would continue to be predominant in any additions that were made, and the purpose of the Museum would probably be suggested on the exterior by a colossal picture in mosaic and as many works in sculpture as could be obtained by a modest expenditure of money. But a more rational system having been adopted, which allows architecture to assert itself, the consequences will have to be accepted, regardless of the expense. The mere fact that a competition was arranged by the Government is evidence that a demolition of parts at least of the Museum is contemplated, for it was quite possible to complete the building in the style of the executed work from plans which were formerly prepared.

The design bearing a Greek motto would merit the prize if the new works were to be confined to the additions prescribed to the competitors. It is well adapted for terra-cotta. The figures that surmount the central part are not in keeping with the style adopted, and would appear out of place at South Kensington, but the delicate relief which covers so large a part might be considered as inspired by the *genius loci*. Sir Henry Cole could hardly fail to admire the design, but he would be likely to object to so much relief, as the district now sends out enough dust and soot to fill up all hollows without respect for art. The introduction of a fountain near the Exhibition Road (to accommodate which the building front is made concave at the corner) would also please him. The building is shown as of two storeys, with a mezzanine, and there is no tower, a feature that was not considered necessary when the Museum was started. The entrance-hall is a rectangle, with the longer sides parallel to the front, surrounded by a corridor, and flanked by the eastern and western courts. There is a drive in front. The ironwork in the spandrels of the roof principals could be easily arranged in a more pleasing way. Altogether the design may be taken as a compliment to the Museum, for it shows that the style adopted there is capable of some development.

"English Tradition" is essentially a design for masonry. It is Classic, and the general horizontality is emphasised by the treatment of the ashlar. There is little arching, and where it is used the depth of the voussoirs forms a contrast with the parallelism of the courses. The author is sparing in fenestration, and, apart from the gain in architectural effect which the absence of openings secures, there is more truth, for what is the use of windows in the sides of a building when it is notorious the principal light must be obtained from above? At a time when so much license is taken in the treatment of Classic, a wholesome effect would be produced by the appearance of a building like that shown in the design. But such an exterior would make the courts at South Kensington more insignificant than they are. There is no concession to the pretty things devised by the decorators, and, in fact, inside and outside would be in opposition if the design were realised. The building is kept low throughout; the south-west angle is treated so as to increase the general appearance of strength, and the columns employed are Ionic. There is a squat tower, which is not improved by the double set of pediments. The entrance-hall leads into a circular court which has four semicircular recesses, one of which would be used for the sale of catalogues. From the central court are corridors leading to the other courts. The building proposed is too severe to meet approval in our time; but the author deserves credit for adherence to a style that he believed was the most fitting, although by doing so he courted rejection.

The design marked by a shield with an arrow in the field appears in the perspective as very complex, and its character should be judged from the details. The exterior

would be of red brick and stone. Importance is attached to the central hall, of which the dome is rightly made to appear in the centre of the exterior view, and it is connected with the front by flying buttresses. The entrance is also made an important feature, being flanked by two towers, and evidently much thought has been bestowed on the central part of the south face. The central hall is lighted by windows below the springing of the dome and a glazed opening at the crown. The soffite is coffered, but in such a building it would have been better to employ painted or sculptured decoration. Around the hall are galleries ; the dome is carried by coupled columns and arches with figures in the spandrels. A sign of the care taken in the detail is shown in the truncation of the triangular space in order to avoid too long a line of drapery, but the change is not to be recommended. The windows are well arranged, each storey being different, those in the third being triple and having almost the effect of an arcade, and the front is divided into bays by piers and columns. At the north-west angle is a tower with a gallery on top surmounted by one of those octagonal tiled roofs sometimes seen in Italy. This design becomes more interesting as it is studied.

The design inscribed "Prince Albert" is shown on a perspective that might be the work of one of M. Lessore's pupils. It suggests that South Kensington is a place of floods and darkness. Any building with such an environment can hardly be taken as captivating. The entrance-hall is rather small, but in this design more importance is given to a staircase than in the others. The central part of the exterior is made concave on plan, and is enriched by a line of Corinthian columns. That the important part of the building is not in front is made visible from the outside, the part nearer the road being lower in height. There are two octagonal courts which are covered with flat domes, and they afford contrast to the horizontal lines. At one end is a high tower. There is much novelty in the treatment, and from the number of finely curved lines, it is a pity the design cannot be shown by a model.

"Verona" is the motto on a design which a builder would appreciate for its definiteness. There is no striving after originality. The centre is recessed in this case also, the junction of the connecting curves being marked by pavilions. There are two storeys, the upper one having an arcade with coupled columns, the lower part of the shafts having sculpture. The central court has a coved glass roof, which is visible from without. There is an effective tower on the west side.

The successful design no doubt gained approval partly by the respect for economy which it exhibits. Mr. Webb is not afraid of repetition. By placing the tower in the centre he not only makes it useful by giving dignity to an entrance which is through it ; but in consequence of its position symmetry, and therefore economy, appear to be essential. The windows are large ; square-headed in the basement, and with round heads on upper storey. Whether they were so arranged out of respect for the Natural History Museum need not be discussed ; in any case they are of forms that are well adapted for terra-cotta. The central part of the principal front is recessed ; in this case curves are avoided, and the angles are marked by pavilions. The south front, taken as a whole, is distinguished by an appearance of simplicity, which deserves commendation. The court that will be first entered from the hall measures 170 feet by 83 feet. The Oriental court is 144 feet by 98 feet. The principal court will have a more architectural character than any found in the Museum, and from its solidity it will not be suggestive of a transformed conservatory.

"Ars longa, tempus breve," might be supposed to have been a close competitor with the successful design, if it were not for the sort of Temple Bar that is introduced above the principal entrance. There are some good features. The raking lines in the staircase tower at the corner, which most of the competitors have emphasised in some way, are a welcome contrast to so many vertical and horizontal lines. The small stairs to the skylights do duty as piers. The principal approach is also managed admirably. Some of the columns have reliefs on the shafts, and sculpture in relief is introduced near the columns. The principal court is square on plan, with a circular dome that springs from girders which cut off the angles, the outer spaces being covered with semi-domes. In this design, as in Mr. Webb's, there is much to suggest light and ample space.

In "Chi se contenta gode" the ground is fully utilised. The front is brought near the roads, and as the acute angle formed by the Exhibition Road is accepted as indispensable, the western courts are not rectangular, a defect that is already visible in the Museum. One of the gains by the arrangement is a very large central court, which, however, is not as successfully treated as is desirable. The central part in this case also is set back, with a tower in the middle and pavilions at the angles. The windows are generally square, with arched heads for sculpture. A large frieze is introduced on the central part, and it is one of the features which can be praised without reservation. It is evident that the author spent much time in quest of surprises, but the results are not always satisfactory.

Taken as a whole the designs do not afford evidence in favour of limited competitions, unless on the ground that trouble was spared in the examination. There are many architects who have been constant frequenters of the Museum, and who have often speculated about the completion of the building. We may go so far as to say that few cases could be found in which so many were prepared for the contest. They deserved to have a chance. When it was decided to ignore the official plans, the Government would have acted more wisely to have arranged for a general competition. It is true the result in the War Office and Admiralty competition was not encouraging, but the circumstances are different with a scheme like the South Kensington one, which has already given rise to much experimental designing.

THE SOCIETY OF ARCHITECTS' EXCURSION TO BELGIUM.

IT was a signal honour which was conferred upon the Society of Architects, and, through that Society, upon the whole body of English architects, when, on Saturday last, a party of forty-one of its members and their friends were granted an audience by His Majesty the King of the Belgians, on their landing at Ostend for an excursion of a fortnight's duration in his country. When ushered into the presence-chamber, the president (Mr. W. H. Seth-Smith, F.S.I.) advanced and delivered the following address, which he informed His Majesty had been illuminated by one of the members :—

To His Most Gracious Majesty, Leopold II., King of the Belgians.

May it please your Majesty,—Upon this, the occasion of the first visit of the Society of Architects of Great Britain to Belgium, they desire to express to your Majesty their sense of the great honour which you have conferred upon them by granting them an audience, recognising in that favour the fact that your Majesty welcomes them as being professionally interested in the ancient buildings of your country, buildings whose reputation for beauty is world-wide, and whose origin lies in the civic liberties and enterprise and in the religious devotion of your subjects. These monuments of taste and skill are particularly attractive to the modern English architect, who gladly acknowledges his indebtedness to them for many an inspiration. The Society also recognises in your Majesty's gracious reception, and that of your people, a desire that the architects of Belgium and of England should be brought into closer and more friendly relations with each other for their mutual benefit, and that the buildings of each country should become better known to the architects of the other, with a view to the erection in both countries of works of greater dignity and beauty. This, and other objects bearing upon the development of architecture, the Society of Architects was formed to promote, and its members will continue to support and forward them at all times to the best of their ability.

Signed on behalf of the Society,
W. H. Seth-Smith, *President.*
Edgar Forman, *Honorary Secretary.*
G. A. T. Middleton, *Secretary.*

To this the King replied at considerable length, pointing out where, and in what way, ancient Belgian differed from ancient English work, and particularly drawing attention to some modern buildings in the towns to be visited during the excursion, giving a very pressing invitation to the members to visit his new palace at Laeken, near Brussels, now in course of erection, next Saturday afternoon being fixed for the visit. Each member of the party was then introduced to him in turn, and from each he asked for information, being evidently impressed by the great number of localities which were represented.

The audience over, the members dined and toasted His Majesty, proceeding afterwards to Bruges, where Sunday was spent in quietude.

Monday was a busy day, for Bruges is full of interesting work, and everybody wished to see it all. The first visit on the programme was to the Hôtel de Ville at 10.30, and the members were to time; yet before that they had visited the Carmelite Church, with its Renaissance work, and had had a passing glimpse of the new Normal School for girls. It was the city architect, M. Saucerie, who met them at the Hôtel de Ville, and took them over it and the adjoining buildings, showing them the old Council Chamber, now under restoration by himself, and in such a condition as rendered careful inspection of the ancient construction of both brick and timber vaulting and of the heavy timber roof an easy matter. He then escorted them to the adjoining house, the ancient "Greiffe," for an inspection of the fine Renaissance doors now preserved there, and to the Palais de Justice, to see the chimneypiece which everybody knows. It may be prejudice against that which everybody sees, but it did not seem so tasteful as the less assuming work in the doors just mentioned, or that in an old bookcase in the jury-room adjoining. It is bold and well conceived, most certainly, but leaves a confused impression, which the best work should scarcely do. The "Tour des Halles," or belfry, which boldly fronts the Place, of course was well worth visiting, to see the mechanism of the bells, worked by a great studded drum, like that of a huge musical-box, automatically by the clock, every quarter of an hour. Some hammered ironwork, too, was deserving of study in the muniment-room there, as much from the manner in which the coils had been formed from slices of iron cut down off the main stem as from the actual design.

About the Chapelle de Sainte Sang it was a general grief that little time could be devoted to study of the exquisite Flamboyant foliage on the exterior, while the interior, save for a fine picture and a little good hammered brass, was scarcely worthy of the time devoted to it. Then came a hurried visit to the old houses in the Place Van Eyck, and then the principal feature of the day, a careful inspection of the Normal School, glanced at in the morning, under the conductorship of its architect, M. Saucerie, who has, from long study of his native work, become thoroughly imbued with its spirit, and is producing, not only in this building, but in the new post office in the Place and many other edifices in the city much to show that he works as our forefathers worked, simply using the knowledge of his predecessors and unconsciously developing it to meet his modern needs. These examples are not mentioned in the guide-books, but all architects visiting Bruges should make it a point to see his buildings. Still there was the Cathedral to be seen, with the delicate Gothic tracery to the choir-stalls and the carved misereres, curious, as is usual; and here another excellent conductor was met with in the resident canon. The church of Notre Dame was also visited, the exterior of the small baptistery, a beautiful specimen of fourteenth-century work, being much admired. After that several of the members inspected Memling's pictures in the hospital of S. Jean; but there was little time to spare, and the train was entered in order to proceed to Ghent shortly after six o'clock.

Tuesday opened warm and cloudy, so that the light was indifferent as compared with that of the previous day, and the buildings of Ghent suffered in consequence, though no considerations of mere light, so long as there was enough to see by, could much affect the delight which architects must of necessity experience when seeing the Hôtel de Ville, and especially the skipper's house, for the first time. Unfortunately, however, but little time was given to these buildings save by the non-political Separatists, who prefer to sketch in solitude to scurrying about in charge of even such conductors as have placed themselves at the disposal of the Society during this excursion. M. Van Assche, the architect for the restoration of the Cathedral, still proceeding, acted in that capacity on Tuesday, leading the members first over the edifice with which he is most intimately concerned, a building which, having been destroyed, except the mere shell, by a fire in the sixteenth century, he has almost had to reconstruct, and though his work may not be that of an original artistic genius, it at least shows careful study of what has gone before, while the triforium and clerestory are really very fine. The palace of Gerard le Diable had a fine hall to show, dating from the thirteenth century, though seemingly much older, with stone vaulting carried by two rows of columns, having the simple foliage of the caps springing directly from the piers without the intervention of a necking; but the ruins of the Abbey of St. Bavon were of much greater interest, containing fragments of primitive Roman walling, and much good Romanesque and slightly later work, all now in picturesque confusion, and not much the worse for exposure to the atmosphere. Much time was given to it—more than could well be spared, for even yet, well on in the afternoon, the Hôtel de Ville had not been seen. It was passed by with a hurried glance in spite of its great beauty, the full meaning neither of the elaborate Gothic carving nor of the two flanking simple bits of Renaissance with superimposed orders, each setting off the other, being fully grasped, nor even points of detail mastered. The château of the Counts of Flanders was little worth a visit, but this was well made up for by the inspection of an unique twelfth-century oak open roof—that to the Boucherie, gloriously bold and perfect still, which but for M. Van Assche would have been passed over, as it is by nearly every visitor to Ghent; nor would it, in its great simplicity, appeal to any save the architect and archæologist. It is different with the rich skipper's house, seen last, with its wonderful richness of design and play of colour in the mouldering stone, set off so grandly by the plain neighbouring building, Romanesque and Renaissance, upon the Quai aux Herbes. It was most regretfully that Ghent was left for Antwerp early in the evening, but the journey is a somewhat long one, and a later train would have upset all arrangements for a comfortable dinner there—and even touring architects are human, and regard the inner man.

THE VICTORIAN INSTITUTE OF ARCHITECTS.

THE annual meeting of the Victorian Institute of Architects was held on July 6, Mr. George C. Inskip, president of the Institute, occupying the chair. There was a large attendance of members.

The President delivered his annual address, in which he stated that the first examination in architecture to qualify for admission as associate was held during the first week in May last, when four candidates presented themselves. Of these two passed, but the gold medal was not awarded by the examiners, as the work done did not in the opinion of the examiners reach the required standard. The most important matter which had occupied the attention of the council during the year was the Registration of Architects Bill, which had been framed with a view to preventing others than skilled persons from practising as architects. Mr. R. W. Best, M.L.A., had taken charge of the measure. The council had also had under consideration the advisability of endeavouring to induce the Government to call for competitive designs for all buildings likely to cost 5,000*l.* and upwards; but in view of the constant complaints made by members of the Institute as to the mode in which architectural competitions were generally decided, the council thought it inadvisable to approach the Government until satisfactory rules regulating competitions were drawn up and adopted. The council had also been in conference with the Builders and Contractors' Association on the question of the conditions inserted in contracts, and a hope was expressed that before long amended conditions, satisfactory alike to builders and architects, would be laid before the members. As soon as the drainage of Melbourne was taken in hand by the Metropolitan Board of Works an immense amount of work would have to be done in connecting dwellings with the sewers, and this work would require the most careful attention of architects. If this part of the sewerage system was not properly carried out, the danger to health would be much greater than under the present system. In his opinion a consulting architect should be appointed to advise the board in all matters relating to buildings. A new Building Act was also required. It appeared from the census returns that the population of Melbourne had now reached nearly 500,000, and though over legislation was to be deprecated, there was great need for stringent regulations regarding the erection of new dwelling-houses and the laying out of new streets. The Act should be framed so as not to unduly interfere with building operations, but it should insure the erection of none but healthy dwellings and well laid-out and properly-drained streets. It was also absolutely necessary that some regulation should be in force to put a stop to the erection of such death-traps as might be found by the hundred

in the various suburbs of the city. There should also be some limit put upon the height to which buildings should be erected. The width of the street should to a great extent govern the height of buildings, as was the rule in Germany, France and Sweden. The erection of ten and twelve storeyed edifices greatly increased the risk by fire, and also dwarfed the many well-proportioned buildings in the immediate neighbourhood of these buildings, and made both appear ridiculous. No matter how skilfully these buildings were designed, they were certainly a disfigurement to the streets. It should also be made compulsory, where land was being cut up for building purposes, that the roads should be formed and the drains laid down before it was allowable to erect any buildings. In many cases this plan had not been adopted in the past, and after the roads were made it was found that the floors of the dwellings were below the street level. In the matter of artisans' dwellings they had seen by the failure of one of the largest building societies instances where streets of shoddy houses were allowed to be erected. The Building Act should be framed to put a stop to the erection of such places. The housing of the working classes was a matter of vast importance. At present they were compelled in many instances to live in shoddy houses, put up by greedy speculators, without proper drainage or ventilation, and the rent of these death-traps was excessive. On the question of architectural education, there were many highly-trained and educated architects, but they did not receive from the public the encouragement to which they were entitled. He trusted, however, that the endeavours to raise the standard of architectural education would do much to point out to the public the important position which the architect held. No doubt a good deal of sickness had been caused by the badly built, badly drained and badly ventilated houses in which so many people were contented to live. The scheme of examination lately adopted by the Institute would do much to raise the status of the profession, and to gain for the members the confidence and respect of the public, and would show that they were worthy to occupy a leading position among the other learned professions. The Melbourne University possessed a well-equipped civil engineering school, to which should certainly be added a school of architecture, so that young men could obtain a thoroughly scientific training.

The election of office bearers was proceeded with. It resulted as follows:—President, Mr. G. C. Inskip; vice-presidents, Messrs. P. Oakden and P. Matthews; hon. treasurer, Mr. D. R. Stewart; members of council, Messrs. F. Purbrick, Lloyd Tayler, A. M. Henderson, J. Talbot and T. S. Watts; associate member of council, Mr. R. C. Hyndman.

HOLBEIN'S "AMBASSADORS."

THE painting by Holbein, commonly known as *The Ambassadors*, is now visible in the National Gallery, and every one who sees it must approve of the wisdom which decided the purchase of the work from the Longford collection. But there are many of the details which are not easily understood. Sir F. W. Burton hints that he will be able to elucidate the mystery. Meanwhile Mr. C. L. Eastlake offers the following explanation of some of the accessories:—

The words inscribed on the open choir-book which lies on the open shelf of the what-not were, until the picture had been cleaned, somewhat obscure, and even now, what with the old form of spelling, the abbreviations, and the obliterations of age, are not easily decipherable, but as I read them they appear to be these. On the left-hand page:—

> Kom Heiliger Geyst herzegott erfüll mit deiner gnaden und (?) deiner gleubge hertz mut un sin dein brustig lib entzüd in ihn.
>
> O herz durch deines lichtes glast (?) züdem glaube versamlet hast das volck aller welt zunge . . . (?) dir herzu lob gesungen . . . gesungen . . .

On the right-hand page:—

> Mensch wiltu (?) leben seliguch und bei Gott blibene Solch (?) halten die zehen gebot die uns gebeut unser Gott . . . unser . . . D . . .

It seems to have been assumed that the choir-book is a Protestant one, and therefore inconsistent with the presence of the silver crucifix recently revealed in the left-hand upper corner of the picture. But it is evident that the hymn or anthem above-mentioned is merely a paraphrase of the well-known "Veni Sancte Spiritus," which for ages past has appeared in the Roman Catholic breviary for use on Whit Sunday or the Feast of Pentecost, and still survives in the Anglican Ordination Service. On the other hand, it must be remembered that the crucifix is retained to this day in Lutheran churches, and cannot therefore be regarded as any evidence that the persons represented adhered to the more ancient form of faith. In view of these facts, all supposed inconsistency involved by the introduction of the two objects in question at once disappears. The terrestrial globe which lies on the same shelf as the choir-book presents a point of historical interest. Somewhere between 40 deg. and 45 deg. W. longitude a red line has been traced, stretching from the North Pole towards the South, passing west of the Azores (named Accores on the globe) and west of Cape Verd Islands—St. Antonio is indicated—but considerably east of the Antilles, among which Antigua is marked, and continuing southward into Brazil, where it is lost in the perspective of the sphere. Near this red line will be observed the words:—

> LINEA DIVISONIS CASTELLANORV ET PORTVGALLEN.

The significance of this inscription is explained by events which had occurred towards the close of the fifteenth century. They are thus concisely recounted in the article on "Spain" in the "Encyclopædia Britannica":—"The Spaniards now turned further westwards, and a wholly new problem was created by Columbus's discovery of the West Indies in 1492. His voyage had been undertaken under the patronage of Isabella, and the new territories were regarded as pertaining to Castile. To solve any difficulties that might arise, a Bull was obtained from Alexander VI. in 1493, which granted to Spain all discoveries west of an imaginary line drawn 100 leagues to the west of the Azores and the Cape Verd Islands. As this arrangement excited Portuguese discontent, it was modified by a treaty at Tordesillas in 1494, which removed the boundary line to 370 leagues west of the Cape Verd Islands. This modification had important results for the Portuguese in giving them their subsequent claim to Brazil."

The "imaginary line" referred to is no doubt the one marked on the globe. With regard to the distorted skull in the foreground, I think it probable that Holbein painted it in a convex mirror, the radius of whose curve was parallel to the plane of the picture, and the best confirmation of this hypothesis is that a convex mirror, placed transversely towards the same plane, reflects the skull in its normal proportions, if such a term may be applied to this dilapidated relic of humanity.

In reference to the theory that this object may indicate the decease of one of the so-called "Ambassadors"—viz. the pale personage depicted on the right of the spectator—I may add that, unless my eyes deceive me, the emblem of a skull is repeated on a small scale, as an ornament, in the cap worn by the more important looking figure on the left. Whether these several facts, directly or indirectly, may tend to throw any light on the identity of the persons represented by Holbein is a question, but it seems desirable that all details connected with this truly remarkable work should be recorded.

THE EDINBURGH HERALDIC EXHIBITION.

A PAPER was read by Mr. J. Balfour Paul, Lyon King of Arms, on "The Edinburgh Heraldic Exhibition" at the Congress of the Archæological Institute. It was his desire, he said, to describe some of the most interesting articles in the exhibition which had been got together in view of the visit of the Archæological Institute. Archæologists were divided into many classes, but few could afford to dispense with some knowledge of heraldry. It was, however, through the art of the illuminator that heraldry appealed most strongly to the popular taste. People who knew nothing of heraldry as a science, and who were not interested in tracing the descent of a family and exploring its various alliances, could still admire a finely-executed blazon as it appealed to their artistic sense. Look, for instance, he said, at the grant of arms to the Tallow Chandlers' Company of the City of London. It was one of the oldest, if not the oldest, grant in existence. It was given by Joshua Smart, Garter King of Arms, on September 24, 1454, thirty years before the present College of Arms was incorporated. However useful the art of printing might have proved, there was no doubt that from its introduction the decadence of the art of illuminating and writing manuscripts might be dated. The grants or arms of the next century were tawdry and stiff in comparison with their predecessors, and indeed it might be said that the art of blazoning had never again reached such high excellence as it did in its early days. As regarded grants of arms, England easily bore off the palm both in respect of beauty of design and artistic treatment. What were probably the two earliest Scottish grants in existence were both exhibited, one to Sir James Balfour, of Pittendreich, and the other to Lord Maxwell of Herries. The most interesting, as well as the most artistic memorial connected with Scotland was that from the Archerfield library (671), which, he believed, for the first time was brought into public notice. Its history deserved a word of mention. The first owner of the book of whom they had taken any record was Lord George Seton, the devoted adherent of Queen Mary, who met her on the shores of Lochleven, and who was afterwards exiled for adherence to her cause. On his death in 1585 it became the property of his son, Robert, afterwards Earl of Winton, and about 1630 it was acquired by the Marchmont Herald, subsequently passing into the possession of Wm.

Nisbet, of Dirleton, to whose representatives it still belonged. This armorial marked a distinctive advance in respect of artistic treatment on anything which had been previously seen. The figures of the Scotch monarchs were full of vigour and individuality, and with all of them there was a manifest aim to adhere with antiquarian accuracy to the costume of the various periods. The faces were evidently intended to be portraits, and agreed with the traditional representations of the monarchs. James IV. was depicted with an iron chain round his waist, which, according to tradition, he wore constantly next his skin in expiation of his rebellion against his father, and by means of which his body was said to have been identified after the Battle of Flodden. The effigies of James VI. and his Queen were particularly rich and elaborate, a purple canopy being introduced, blazoned with the arms of Scotland impaling Denmark. Mr. Paul then glanced at the foreign exhibits, remarking that in the case of the armorials they were represented by facsimile reproductions, though he had not seen any of the original MS. Not the least interesting part of the collection consisted of those articles of very diverse kinds which had some definite historical association. Among these was mentioned the great Cavers banner, which was said to have been the banner of James, second Earl of Douglas and Mar, and to have been carried by his son, Archibald Douglas of Cavers, at the battle of Otterburn, 1368. If this were so, and he saw no reason to doubt the tradition, it was one of the oldest flags in existence. Other interesting exhibits to which he directed attention were the "Percy Gauntlets," said to have been attached to Hotspur's lance as a *gage d'amour*; the Ballender banner, anciently carried by the Scotts of Buccleuch; the actual copy of the Statutes of the Order of the Garter illuminated on vellum sent by Henry VIII. to James V. of Scotland; a Book of Heroes of the Thirteenth Century; the protest of the Bohemian nobles against the burning of John Huss and Jerome of Prague, which is in the possession of Edinburgh University; and a little gold signet found during some excavations at Kinross in 1829, and bearing the arms of Joan Beaufort, daughter of John, Earl of Somerset. Those of them who were collectors of books would find a fair selection of the heraldic works which had been published in this country, and had they had a little more time and space at their disposal he did not think it would have been impossible to have got together a complete collection. The facsimiles of Scottish seals, which were exhibited, showed that Scotland was not behind her neighbours in the early ages in respect of the art of seal engraving, and was perhaps the clearest and most complete proof that was extant of the artistic vitality of the Scottish nation from the thirteenth to the sixteenth century. Mr. Paul then gave a few observations on the miscellaneous objects in the exhibition, and directed the attention of his audience to the series of sketches illustrating the heraldic features incorporated into the architecture of some of the principal mansions in Scotland. To those whose tastes inclined to the splendour and solemnity of State ceremonial, the section of the decorations and the various orders of knighthood lent by the Lord Chamberlain could not fail to be attractive. Mr. Paul also dealt with the exhibits of stained-glass, metal and needlework, china and rubbings from heraldic brasses.

THE PROGRESS OF ARCHÆOLOGY.

THE Antiquarian Section of the Royal Archæological Institute was opened with an address on the "Progress of Archæology," by Dr. John Evans. At the outset he remarked that they might congratulate themselves that several of the distinguished members of the Institute who so much contributed to the success of the Congress of 1856 in Edinburgh, were still alive to take an interest in their proceedings that day, even though they might not be bodily present among them. It seemed to him that a few words on the progress made in archæological science during the last thirty-five years would not be out of place on the present occasion, especially when it was borne in mind that no inconsiderable part of that progress was due to the labours of Scottish antiquaries. One vast and interesting archæological period affording a new domain for the researches of both geologists and antiquaries, who met there upon a common ground, had within that time been, he might say, discovered, and the Palæolithic or River-drift period now demanded from the archæologist as much attention as the Neolithic or Surface-stone period. Not only had the existence of Palæolithic man been proved in England, France, Spain, Italy and other European countries, but strong presumptions had been raised as to his having left remains of his handicraft both in Northern and Southern Africa and on the eastern coasts of Hindostan. Closely allied to this River-drift period, but in many cases representing a somewhat later stage in the Palæolithic age, was what had been termed the cave period, when the now northern reindeer formed one of the principal means of subsistence for the early hunters of the south of France. In this department vast accessions to their knowledge had been made during the past thirty-five years. Magnificent collections of the relics of these early cave-men had been added to the British Museum, mainly through the liberality of the late Henry Christy; and the Blackmore Museum at Salisbury, rich in prehistoric antiquities, had sprung into existence since they met in Edinburgh. Between the latest phases of the Palæolithic or River-drift period, and the earliest of the Neolithic or Surface-stone period, there existed a gulf which, notwithstanding all efforts that had hitherto been made, had not as yet been satisfactorily bridged over. Their knowledge, however, of all that related to the Neolithic period had materially increased since 1856. The "Proceedings of the Society of Antiquaries," both of London and Scotland, as well as of the Archæological Institute and the British Archæological Association, all testified to this increased interest, and the consequent advance of knowledge. Among local societies that had specially aided in illustrating the Neolithic period, he might venture to cite that of Ayrshire and Galloway. The development of their knowledge of the Bronze period had kept pace with the advances in other departments. Dr. Evans then touched upon the lake-dwellings of Switzerland, and afterwards briefly considered the immense advances that had within the last quarter of a century been made in their knowledge both of the pre-classical antiquities of Greece and Rome, and of the early history, languages and archæology of Assyria, Egypt and the Holy Land. Returning to our own country, he remarked that so far as Mediæval antiquities were concerned the progress that had been made had been mainly in the direction of architecture; and it was not a little singular that this progress had been to a fearful extent accompanied by a destruction of Mediæval architectural remains under the pretext of restoration. Either from a desire of producing a uniformity, which in reality never existed, or of showing their own taste, architects had sentenced many of the most interesting features of our ancient ecclesiastical buildings to destruction, while much of the architectural history of the past three centuries had been ruthlessly destroyed. The singular hankering of so many of the clergy of the Reformed Church of England for all that savoured of pre-Reformation tastes and practices had not a little conduced to the obliteration of many an interesting feature in our churches, the destruction of monuments subsequent to the sixteenth century, and the melting down of Elizabethan and seventeenth-century plate. Perhaps at the present time some feeling of remorse was creeping over those who had wrought so much mischief in the past, and in some degree the plague of restoration was stayed. One of the most important handmaids of history was the science of numismatics; and though our Jubilee coinage did not testify to any advance in the art of coining, our knowledge of the former coinages of this and other countries had of late years materially increased. In heraldry no special advances had been made, though the works of Boutell and others had helped to popularise the subject. The general advance in antiquarian knowledge, the enlightened awakening to the interest that attached to the past was in the highest degree satisfactory, and not the less so that so much of scientific method had of late years been introduced into the study of archæology.

THE NATIONAL LIBRARY OF IRELAND.

THE annual report on the new library erected by the Government in Dublin states that it is fulfilling the object for which it exists, and the utility of the library seems likely to be increased. The librarian, Mr. William Archer, says:—

I may, I trust, be forgiven if I take this opportunity to place on record my great personal satisfaction that at last the National Library of Ireland finds itself in this new and fine building, adequate (when the other wing shall be erected) for its housing for many a year to come, and eminently fitted for its purpose as regards economy of storage space (which, as compared with other modes, becomes more than threefold augmented), convenience of approach to the books, shortening of distances, mitigation of physical exertion (including abolition of the use of ladders) and ultimate saving of time. That satisfaction is naturally enhanced by the reflection that I myself may claim a fair share of the credit of those structural changes from ancient and established custom, handed on from generation to generation; changes which I had from time to time, for ten years or more, urgently advocated both in print and by correspondence, bringing the same beneath the notice of the governmental authorities, men of public eminence, and home and English architects, with quite a number of whom, as intending competitors, I afterwards personally discussed the whole question—efforts which, I rejoice to know, were at last not without their influence. The great prominent and all-essential feature of those changes consists in the separation, in a large and commodious reading-room, of the readers from the books, and the placing of the latter, in lateral wings hard by, on presses standing across the floors and only three feet asunder, and of such a height only as to be within reach of the

arm and of the eye without the use of ladders, approach being had to these, tier over tier, by fixed (straight) stairs, this system carrying with it all the before-mentioned advantages. In fact, on a space of ground only about equal in area to that of the circular reading-room of the Library of the British Museum, there has grown up a building with a large and a smaller (ladies') reading-room, affording accommodation for some 250 readers, seated at one time (if needful), a trustees' board-room and private offices, and further capable of containing in the wings, when the accessions to the collection arrive, about two-fifths of the number of volumes at the present moment in that great repository, and this accomplished simply by utilising for storage of books, not the superficial area of the walls, but by taking advantage of the internal cubic space, which in so many library buildings is left a mere useless vacuity—an objectless squandering of space.

I would here express my thanks to our architects, Sir Thomas N. Deane & Son, not only for the readiness with which they at all times, when practicable, fell in with my suggestions, but also for the courtesy extended to me from the earliest beginning onwards, and the trouble taken by them in entering into minor details in their adverse as well as favourable points of view.

WATER SUPPLY OF LONDON.

A PAPER was read by Mr. A. R. Binnie, engineer-in-chief to the London County Council, at the Congress of Hygiene, in which he said :—

A good water supply, forming as it does the basis of all our modern sanitary science, is deserving, in a meeting such as the present, of the most careful consideration. And in the forepart of our inquiries on the subject it cannot be denied that, however obtained and however treated from an engineering point of view, we must, in the first instance, obtain a water of good quality and unimpeachable as to purity. At first sight this may appear almost a truism, but, unfortunately, we do not find it to be either universally admitted or always observed in practice. For this we have to look to the great and almost general result of our modern modes of life and civilisation, which tends more and more to aggregate our population towards large centres of wealth and industry, and these we observe are generally situated on the banks of important rivers or in river valleys not far distant from tributary streams. Not only are thickly-inhabited areas in themselves improper sources of water supply, but they are also directly the cause of pollution to the streams and rivers which flow through them. Consequently we find many of the large towns of Great Britain which are governed by municipal corporations, such as Glasgow, Edinburgh, Lancaster, Manchester, Liverpool, Halifax, Bradford, Leeds, Belfast, Dublin and many others, resorting at great expense to uncultivated mountain tracts, almost uninhabited, and bringing the water from great distances so as to obtain a pure and uncontaminated supply. When, therefore, we occasionally see large towns and cities which have not considered it necessary to take these precautions or to incur the consequent expense, but still continue to drink the water of rivers largely polluted by the more or less clarified sewage and the manure of populous areas, we are led to ask ourselves the question whether the large expenditure of capital that has been incurred in certain cases to obtain a pure water supply has not been an entire waste of our resources. There can be little doubt that human beings can, for a considerable time, drink with impunity water largely contaminated with the excreta, both solid and fluid, of healthy persons, and that they are able to do so with impunity and without loathing and disgust appears to be due to ignorance and apathy on the part of the water consumers and to the power which rivers possess of apparently destroying and veiling the more gross and palpable polluting substances. There are some persons, no doubt, who teach that running water has the power of entirely destroying sewage and other polluting matter which may pass into it ; but there are few, let us hope, who would say that we can with safety drink water which has been polluted with the excreta of persons suffering from cholera, typhoid, smallpox and similar diseases, and yet this is practically the position taken up by those who advocate unreservedly the propriety of deriving supplies of drinking-water from rivers on the banks of which, at no great distance, are situated large towns, for sooner or later we must expect epidemics to arise even under the most careful management. Of two facts we may feel quite confident, first, that water subject to pollution is a very potent factor in the spread of disease ; and, second, that there is, perhaps, no better mode of introducing into the human system any substance which it can absorb than by drinking it in the form of a solution. This being the case, it almost follows as a natural consequence that the utmost care should be taken to guard our supplies of drinking-water from contamination, and yet we see persons around us who shut their eyes to observed and well-known facts and speak of the teaching of science and the experience of the world as sentiment, and who continue to force upon a large number of their fellow-creatures supplies of water contaminated with the excreta of millions of men and animals. That wells are frequent sources of death and disease due to their contamination by house-drains is too patent to require a word of remark, and yet it required the cholera outbreak of 1849 and the death of some thousands of persons to impress the fact on the people of London. And it appears to be forgotten that to drink river water polluted by sewage cost London in the cholera outbreaks of 1854 and 1866 the deaths of over 16,000 persons. That people will go on for years drinking a supply contaminated by infiltration from graveyards, notwithstanding frequent warning, is proved by the outbreak of enteric fever in 1888 at Cradley, which caused 16 deaths in 113 cases. The case of Lausanne, in Switzerland, in 1872, proves that typhoid fever can be commenced by spring water flowing miles underground from a neighbouring valley. The cholera outbreak in Spain in 1885 showed that generally the disease passed down the valleys, decimating the towns which drew their water from the rivers, but passing those which were independent of the rivers and had pure and uncontaminated supplies. In India the author has seen a town in which cholera had become endemic almost entirely freed from that dire disease, simply by giving up the water supply derived from a popular drainage area and resorting to a purer and uncontaminated source. And the outbreak of last year of enteric fever in the districts of Stockton and Middlesbrough and Darlington, which derive their water supply from the river Tees, proves that the germs of that disease are not destroyed in their passage for over thirteen miles down that river from Barnard Castle. All these are cases in which chemical science is of little assistance, as it is powerless to detect the germs of disease ; it can tell us of the presence of organic matter, but without a careful inquiry into the previous life history of the water, it cannot pronounce that under all circumstances it is a safe and pure drinking water. Nor from the experience of Valencia in 1885 can we place much dependence in sand filtration as an effectual preventive of disease ; sand filtration may arrest the living germs, but is unable apparently to stop the passage of the minute spores from which they spring. The precipitation and clarification of sewage effluent by chemical agency also can hardly be relied upon, as it merely abstracts about one-fifth of the more solid impurity, leaving four-fifths of the dissolved organic matter to flow off into the river. What then are we to expect from the continuance of supplies to large cities from sources so polluted, but that such cities may go on for years perhaps boasting of the chemical purity of their water and their low death-rate, forgetting that the constitutions of their water consumers are being gradually prepared, by continually drinking small quantities of diluted sewage, to receive the germs of some violent epidemic which sooner or later will visit the sources of supply, and then will follow such an outbreak of death and disease as will cause consternation throughout the land ?

BEHIND THE SCENES.

IN the paper on "The Sanitation of Theatres" read by Mr. Lennox Browne, surgeon, before the Congress of Hygiene, he remarked that of late years much attention had been given to the comfort and even luxuries of the theatre-goer, and to the protection of places of amusement from fire, but little care has been bestowed on the sanitary arrangements, especially below the stage and behind the scenes, as well as in the cloak-rooms, &c., of the auditorium. The majority of these defects are structural. Dressing-rooms are often quite inadequate, faulty in situation, in air-space, in ventilation, in the number of windows and in water-supply. Water-closets and urinals are frequently placed in improper situations, bad forms are used, and sometimes the workmanship is at fault. They are often ventilated into dressing-rooms, refreshment-rooms, lobbies, staircases, and even on to the stage. Ventilation is frequently unprovided for in rooms behind the scenes. Various expedients are adopted. Even with the best forms of ventilation the source from which the "fresh" air is obtained is often impure. The carelessness of the *employés* in matters of sanitation required constant supervision. The majority of the defects are of structural origin, and hence it is impossible to prevent these from being constant sources of danger. The effects produced on the health of the audience were theatre-headache and theatre-diarrhœa ; and of the actors were sore throats, loss of voice, typhoid fever, so-called rheumatism, and habits of intemperance. Certain theatres are recognised in the theatrical profession as risky places to play in, from the liability of illness being engendered. He contended that the authorities should recognise the necessity of framing regulations for the sanitary arrangements of theatres and music-halls, and should make their periodical inspection to this end of no less importance than that of the prevention of fire.

Dr. Dolan (Halifax) said that he had traced many attacks of typhoid fever to the insanitary state of theatres.

NOTES AND COMMENTS.

It is so commonly concluded that diphtheria is mainly caused by defects in houses, it is well to put on record the declaration of Dr. Tripe at the Congress of Hygiene. After the long experience of thirty-five years as medical officer of health in Hackney, he ascertained that there was no evidence that insanitary conditions of houses caused the disease, although they might predispose to it. Now, diphtheria has been one of the maladies on which panic-mongers have thriven, and it would be difficult to estimate the losses which architects have sustained because of the prejudices arising from the supposed connection between sore throats and houses. Dr. Edward Seaton, at the same meeting, explained that diphtheria was independent of what are ordinarily called sanitary conditions. A Belgian, Dr. Schrevens, considered gamecocks and Italian fowls had much to do with originating the disease. Dr. Adams said the organism flourished in certain soils, and was driven forth to destroy by sudden rainfall or lowering of barometric pressure. Nobody dared say that the disease was even remotely caused by architects and builders.

Anybody who is eager to be remembered and has a thousand pounds to spare can secure that end by sending the money to the town clerk of Norwich. The Norman keep of the castle and the prison buildings are being transformed into a museum. There is not, however, enough money to complete the work. The president of the museum, Lord Walsingham, therefore, proposes that any donor of a sum of 1,000*l.* (which would suffice to convert and fit up one of the separate buildings) should be entitled to have the record of his donation permanently inscribed on the building, which should be called after his name. His lordship believes there are people enough who are connected by family ties with Norfolk and Norwich who would take advantage of such an offer. It would be far better if Norfolk and Norwich men could be induced to subscribe the money for the sake of the district. But we suppose it is safer to trust to human weakness. At the same time the proposal is enough to fill students of archæology with terror. Hitherto the names associated with museums have been those of men like themselves, but how can anybody enjoy a collection when over the door is seen the name of somebody that is only worth remembering because he was good for a thousand pounds?

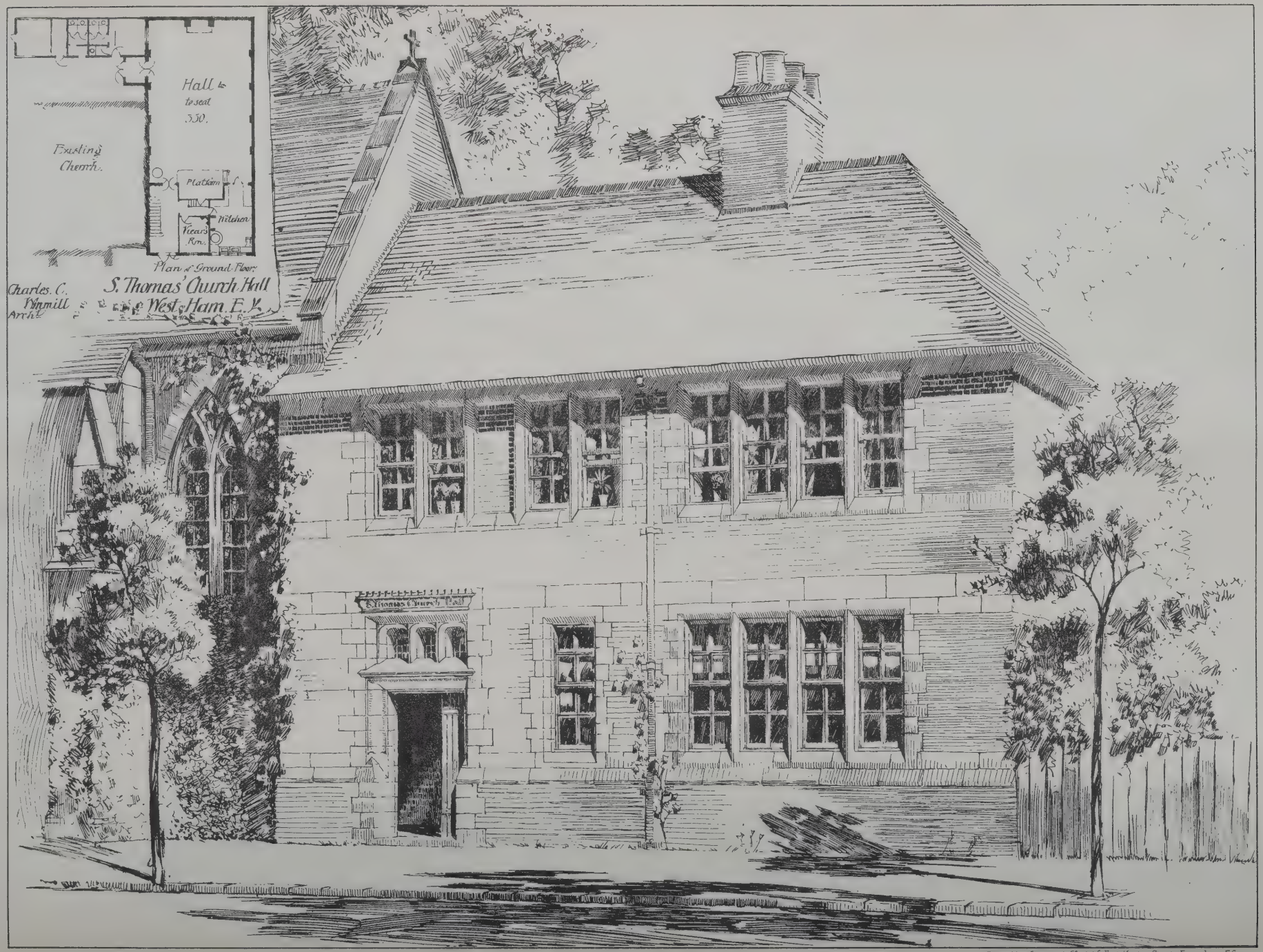
Another section of the Paris Hôtel de Ville will soon be ready for the painted decoration—that is, the principal *salle-à-manger*. The artist will be selected by competition. The ceiling is to be adorned with a large circular painting and two rectangular paintings. There will be also eight paintings over the doors. The sum assigned for the work is 49,000 francs. The subjects are left to be selected by the competitors, but it is expected that there will be some unity between them, and therefore that a general idea will be manifested. The sketches are to be sent in not later than December 15, and they will be exhibited from December 20 to January 5, 1892. From those, three will be selected, and the authors will be invited to paint a part full size. The artist whose work is placed first will be entrusted with the work, the second will receive a prize of 3,500 francs, and the third one of 2,500 francs.

According to the annual report of the Dundee Institute, it is the opinion of the council that if the present energy, good feeling and interest in the work of the Institute continue to be shown, the prosperity of the past seven years will not only be equalled, but greatly surpassed. Last session's membership consisted of 49 members, 152 associates, and 7 honorary members. This year's roll contains the names of 50 members (2 having been elected and one resigned), 168 associates (23 having been elected, while 5 have resigned and 2 have died), and 8 honorary members (3 having been added to the roll, while 2 have been removed by death). There is expression of the Institute's loss caused by the removal by death of such men as Captain Adams and Mr. W. J. Small from the associate roll, and of Professor Carnelley and Mr. Patrick Allan Fraser of Hospitalfield from the roll of honorary members. Of Mr. Fraser's courteous kindness and unstinted devotion to art the Institute has had rich experience, and of Professor Carnelley's devotion to science in its bearing upon the health-conditions of life the Institute has received lasting proofs. The balance in hand has been diminished from 60*l.* 5*s.* to 41*l.* 11*s.* 4*d.* An analysis of the account shows that while the income is practically the same, the council have entered upon some experimental work by way of providing a library and consultation-room and adding to the attractions of the conversazione. Extra prizes to competitors and additional advertising of the lectures will account for the remainder of the increased expenditure. The conversazione of the session was held in the Victoria Art Galleries. Mr. C. Ower, president, occupied the chair. The arrangements for viewing the pictures and for listening to the programme of speeches and music were on the same lines as on the previous occasion.

The Louvre is about to lose a work that was most interesting, although no more than a cast: this is the copy of the chimneypiece in the Hôtel de Ville, Bruges, which is one of the most remarkable survivals of Flemish Renaissance, and is well known by the aid of engravings. Among the numerous statuettes introduced are figures of Charles V., Maximilian, and Mary of Burgundy. The space occupied by the cast is required for other examples of Renaissance art, and moreover only original works are now considered as worthy of the Louvre. The chimneypiece will be transferred to the Trocadéro, where it will be in its right place as part of the series illustrative of architecture and decorative sculpture.

The Worcester City Council are likely to adopt stringent measures for the prevention of the deposit of refuse on building sites. The medical officer in his last report says:—"There has been one matter forced upon my attention, which is in my opinion a serious one. That is, the manner in which old gravel-pits are being filled, and in one instance low-lying ground has been raised, by throwing in street sweepings, the contents of ash-pits, the refuse of gardens and even the contents of privies. Much of the land thus made is presumably intended for building purposes, and I need hardly point out how very injurious an atmosphere would be drawn into houses built on such a foundation. There is a by-law in force in your city which deals effectually with such made ground, and it is not a great presumption to suppose that the owners of these sites and the builders are fully aware of the existence of such a by-law; but if so, on what principle are they acting in allowing to be deposited these vegetable and noxious materials on a spot which, if meant for building land, must be cleared of this rubbish before houses can be erected? Such conditions, if allowed, are just those that lead to bad health and want of vigour, without definite illnesses; but this chronic bad health permits its possessor to succumb to disease, which, under good sanitary surroundings, would have been successfully resisted." At the discussion of the subject the members appeared to be unaware of the existence of the by-law referred to by the medical officer, and apparently no use was ever made of it. The consideration of the abuse is left to the Health Committee, but the Chamberlain warned the Council to be careful not to get into difficulties. According to him the refuse must be put somewhere, and the best thing they could do was to provide another place in which rubbish might be deposited.

Under the direction of M. Vaudremer a church is being erected in the Rue Bizet, Paris, for the use of Orthodox Greeks who up to the present have been obliged to worship in the resplendent Russian temple in the Rue Daru. The cost of the new building will be defrayed by M. Stefanowich Schilizzi. The construction will cost at least 600,000 francs, and the interior decoration is likely to need a similar sum. The church is cruciform on plan, the central part being surmounted by a dome. The Greeks who follow the Roman rite have also their church in Paris, the old building of St. Julian le Pauvre having been assigned to them.



The Architect, Aug. 21st 1891.

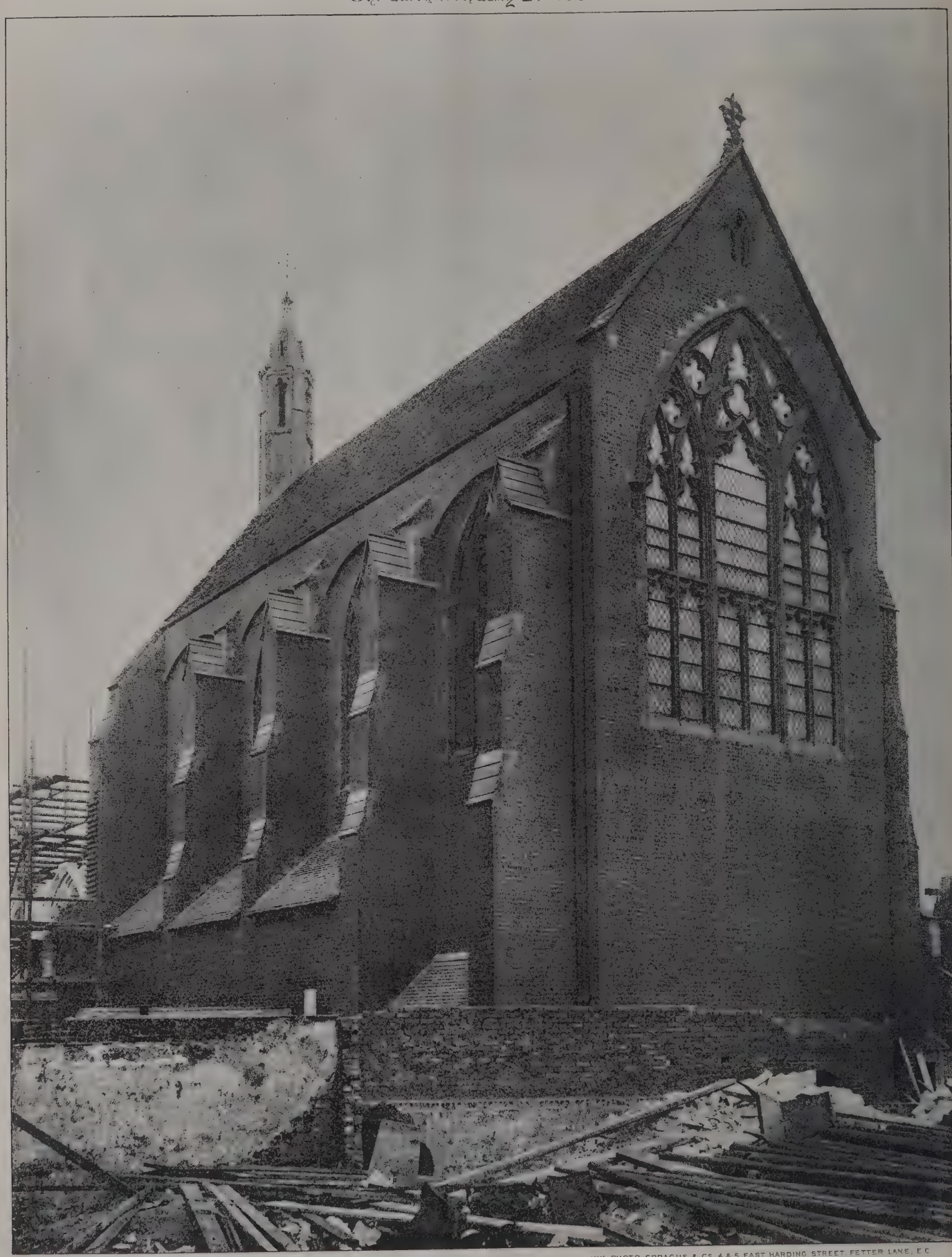
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INTERIOR: ALL HALLOWS, SOUTHWARK.
G. GILBERT SCOTT, M.A., Architect.



INK-PHOTO SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E C

VIEW OF EAST END: ALL HALLOWS, SOUTHWARK.

G. GILBERT SCOTT, M.A., Architect.

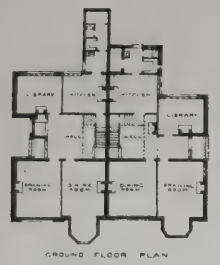
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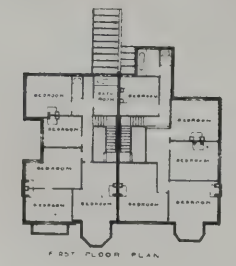


MORNING CHAPEL: ALL HALLOWS, SOUTHWARK.
G. GILBERT SCOTT, M.A., Architect.

Pair of Houses at Burnt Ash Hill, Lee.

R. A. Briggs, Architect.







The Architect, Aug: 21st 1891.

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ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

ALL HALLOWS, SOUTHWARK. [G. GILBERT SCOTT, M.A.]
NO. 398.—EAST END. NO. 399.—MORNING CHAPEL.
NO. 400.—INTERIOR.

PAIR OF HOUSES, BURNT ASH HILL, LEE.

THIS pair of houses are now being built. The walls up to the first-floor level are faced with red bricks, and above that with "rough cast." The roofs are tiled. The mullioned windows will be filled with lead lights, and the woodwork generally will be stained dark brown. Messrs. BALAAM BROS. are the builders who are carrying out the work, and Mr. R. A. BRIGGS, A.R.I.B.A., of 2 Devonshire Square, is the architect, from whose drawing the illustration is taken. The cost of the houses is 1,850*l.*

ST. THOMAS'S CHURCH HALL, WEST HAM, E.

THE DEPARTMENTAL ART SCHOOLS.*

DURING the year ending August 31, 1890, 4,324 elementary schools, with 928,357 scholars, were taught drawing under the regulations of the Department; 708 of these schools were in Scotland, and 48 in Ireland. This was an increase of 505 schools and 79,559 scholars, or 13 per cent. and 9 per cent. respectively, as compared with the numbers in 1888-89, when 3,819 schools with 848,798 scholars were examined.

The grants for drawing during the year 1889 amounted to 54,011*l.* 6*s.* 11*d.*; in 1890 to 70,035*l.* 12*s.* 2*d.*; and the number of schools gaining the awards "Fair," "Good" and "Excellent" respectively were 821, 2,087 and 1,215.

Up to the date August 31, 1890, to which the foregoing statistics were made up, the effect of the Code of the Education Department for 1890, which made drawing compulsory in all schools except those which were specially exempted, had not been much felt, as this condition of the grant is not to be enforced in respect of any annual grant falling due before August 31, 1891. But latterly the effect has become very evident, the number of schools taking drawing having risen from 4,324 to about 9,500 at the end of April 1891. In view of he above-mentioned article of the code we deemed it necessary not to insist for the present on the possession on the part of the instructor of a certificate in drawing as a necessary condition of the school earning the grant for drawing. The effect of this relaxation will be carefully watched, and we trust that the managers of schools will not allow it to be abused, but will themselves see that when the teacher or teachers of the school are not qualified to give instruction in drawing, proper assistance is secured from the outside. This can generally be readily obtained from a school of art or art class in the neighbourhood.

We have also, with the sanction of the Treasury, by minute dated June 5, 1890, offered grants, in accordance with the recommendation of the report of the Royal Commission on Technical Instruction, for manual instruction in elementary schools, and in organised science schools for young lads. Briefly stated the conditions are that the instruction shall be in connection with drawing; on a graduated course in the ordinary tools used in handicrafts in wood and iron; and out of school hours in a properly fitted workshop. We are glad to find that already the country is taking advantage of the aid thus given for manual instruction, 102 schools with properly equipped workshops having been placed in connection with the Department up to April.

The gradual assimilation of the conditions under which the grants for instruction in art are made to schools of art and to art classes, together with the progress made by art classes which are becoming centres for instruction in many of the more advanced branches of art, make it desirable to alter in some respects the form in which our report has hitherto dealt with these institutions. In previous years the statistics of schools of art have been separated from those of art classes, but in the present report such statistics have been brought together, and rendered not only more concise, but, we believe, better adapted for giving a general view of the present position of the art instruction aided by this Department.

The number of art schools and classes examined in 1889 was 1,114 as against 1,182 in 1890, showing an increase for 1890 of 68. The number of students under instruction in them was 88,969 in 1889, as compared with 88,833 in 1890. Of these 76,467 were of the industrial class as defined in the Science and Art Directory, while 12,366 were of the middle class.

* From Report of Department of Science and Art, 1891.

Of the 245 art schools and branch classes and 937 art classes examined last year 203 schools and 772 classes were in England and Wales, 24 schools and 124 classes in Scotland, and 18 schools and 41 classes in Ireland. The number of students who sat for examination was 51,813 in 1890, or 3,098 more than in 1889, when the number was 48,715.

The total number of papers worked by these students in 1890, both in the 2nd and in the 3rd grade examinations was 82,208, of which 35,529, or 43·21 per cent., were successful, as compared with 76,704, of which 39,204, or 51·11 per cent., were successful in 1889. But in addition to the papers worked by these students 13,143 papers were worked by external candidates, and candidates from classes not receiving payments on results, of which 5,611, or 42·69 per cent., were successful as against 7,970 similar papers worked in 1889, of which 4,401, or 55·21 per cent., were successful.

Of the 2nd grade papers worked in 1890 by students of schools or classes, there were 64,521, of which 28,747, or 44·55 per cent., were passed either for 1st class or 2nd class, whilst in 1889 there were 60,296, of which 33,209, or 55·07 per cent., were passed.

17,733 papers and exercises in the 3rd grade examinations were worked in 1890 by students of schools and classes, and of these 6,799, or 38·34 per cent., were passed, as against 16,408 in 1889, of which 5,995, or 36·53 per cent., were passed. The numbers passed in the 3rd grade examination in drawing in outline from the cast, in drawing from models in light and shade, and in shading from the cast show a satisfactory increase. The numbers of candidates, and successes in advanced perspective are nearly the same as last year. In outline drawing from plants, which is considered to be specially valuable as a study preliminary to designing for textiles, a large increase of candidates and successes has taken place. In painting in monochrome, 240 out of 748 were successful. In drawing from the antique, the number of candidates and successes has considerably increased; and in drawing from life there is also an increase. The progress in these two latter subjects shows that the instruction of the schools is generally reaching a higher level year by year. Sciography and painting in monochrome, however, show a decline in the number of candidates. The numbers in the 3rd grade examinations in modelling, which it is necessary to hold in South Kensington, are less numerous than in the drawing or painting subjects, and are about the same as last year.

In 1890, 22,666 students submitted 135,651 works, executed in the schools during the session, for examination at South Kensington. This is a smaller number than was submitted in 1889, when 23,160 students sent up 137,909 works. Though, however, under the influence of recent rules excluding the more elementary works, the number of drawings, paintings and models sent up has declined, the number of meritorious works in the advanced sections has been fully maintained, as is shown by the fact that 3rd grade prizes were awarded to 1,418 students of schools of art, as compared with 1,155 in 1889.

Works have again been submitted to the Department for examination from Barbados, Natal, New South Wales, Queensland, South Australia, New Zealand, and the Isle of Man, Guernsey and Jersey. As the vote for the Department does not apply to these places, the expenses of examination are borne by the local authorities.

457 art class teachers' certificates have been issued, besides 46 art masters' certificates of the first group of the 3rd grade, 17 of the second group, 3 of the third group, 1 of the fourth group, and 1 of the sixth group, during the past year. Altogether 1,991 art class teachers' certificates have been taken.

Those portions of the reports of the examiners on the third grade art examinations which are of general interest are reprinted here. The full reports, which contained, in addition, criticisms on the works of individual students, have been circulated to the schools:—

Perspective.—The solutions of the practice paper for which 2nd classes were awarded are generally very good, and, within the limits of attainment required for such problems, show that the teaching of the more simple portion of the subject has been thorough, and well understood by candidates. The problems in reflections are decidedly better worked than in previous years. The general quality of the work for which 1st classes were awarded is good. Reflections in a horizontal surface are generally well drawn, but the teaching seems (with a few exceptions) to have been carried no further. In both sections of the theory paper it is again to be remarked that candidates are far more apt at describing processes than at stating the reasons underlying them. But there is a notable improvement in terseness and accuracy of expression, and an agreeable absence of irrelevant matter as compared with former years.

Sciography.—A more even measure of attainment is observable in the exercises worked this year than in previous examinations, the number of candidates who display a useful knowledge of straightforward processes being distinctly higher. On the other hand, there are, as probably will always be the case, but few really excellent papers.

Design of Ornament.—In Section I., although a fair number of those passed showed sense of fitness to the peculiar conditions of scale and material (and it may be granted that to design a book-cover in a thoroughly satisfactory way is remarkably difficult), there was too large a proportion showing an absence of the necessary perception of scale and adaptability to conditions of workmanship, into which it may be said even the best designers would be apt to fall if they designed at a distance from, and in ignorance of, the peculiar requirements and limitations of the object and the materials and processes in which the work was intended to be carried out. Thus in regard to the designs for book covers scale was often lost sight of in the choice and details of the ornament adopted, and in the result the effect was that of a design for an ordinary panel in decoration of that prevailing but indeterminate kind which only the closest study of the relations between design and material, beauty and use, will correct. In most cases where lettering was used it was of a degraded and tasteless type, and was seldom regarded as an essential and valuable element in the design.

In Section II. the results showed a great want of simplicity, both in sense of form and ornament, suggesting rather that the designer's object was to produce a showy drawing rather than a workmanlike design for a definite and useful object. A sense of construction and adaptation to conditions was often wanting, especially in the fitting of the handles, always a difficult point. The examiner's impression is that, as a rule, the competing works indicate that the students' eyes have been too much fed upon late examples of pottery and plate, in which the primitive purpose is often secondary to the display of ornament. Ornament, of course, may be rich and abundant, but it should never cease to express the form it belongs to.

Section III. (designs for wall-papers and textiles) showed, on the whole, the most promise, and (as the proportion of passes to papers sent in indicates) a higher average of ability in meeting the conditions of the subject. In the designs for textiles this was perhaps more so than with the wall-papers. In many cases the repeat was not sufficiently worked out or its effect tested by repetition of its main features on a small scale, although in other cases there was a commendable endeavour to meet this difficulty.

Design Composition from a given Figure Subject.—Of a total of 95 drawings under this competition only one received the maximum number. As a rule, the designs showed the same vagueness and want of technical knowledge and sense of adaptability to decorative conditions and material, and the same bias towards pictorial conception and treatment of subject which the examiner has remarked before, and which, in his opinion, is more or less the result of the endeavour to teach designing apart from the practice of handicraft. The vase designs showed more effort after ornate effect and complexity of form rather than simple taste and fitness for the purpose, and even where a sense of the material and purpose was shown the designer appeared to have been led astray by bad models, or had suffered from the contemplation of late and debased types of form. Any imitation of the later Renaissance types in decoration is often fatal, and only results in the reproduction of the worst faults and tendencies of the originals without their redeeming qualities of grace and richness. The designs intended for book illustrations and Christmas cards again, especially the former, showed a want of the sense of the relation of the design to the actual page of the book, as well as (generally) a want of adaptability to any process of engraving; many suffered from looseness of drawing and vagueness of conception; where legends or lettering were introduced it was seldom with any sense of making them form part of the design, and the characters themselves were generally of an unfortunate type.

Architectural Historic Ornament.—The work done by students who have presented themselves for examination in the subject of architectural historic ornament is, I am happy to report, of a very satisfactory character, and such as it has been a pleasure to examine. Not only has the best work been very good indeed and the best drawing excellent, but the general level both of knowledge and draughtsmanship has been extremely creditable. I have noticed some indications of a defect which is a natural one to arise among students of decorative art, namely, that some candidates are far better acquainted with individual ornaments, such as the honeysuckle or the egg and tongue, than with their relation to the architectural features of the buildings where they were anciently used, but I do not think this defect has shown itself so prominently this year as it did last year; and apart from this I am gratified to find the students well informed and able to draw what they wish to illustrate with precision and spirit. Taking the papers as a series the questions designedly spread over a wide range, and they have brought out evidence of very varied studies.

Elementary Architecture.—The work done by the candidates in elementary architecture in 1890 resembles closely that of 1889. The students sitting for a second class seem to me again more uniformly well prepared. The drawings of buildings known to candidates are again in many instances good.

Architectural Design.—In transmitting my return of the marks obtained by the students who took the examination in architectural design, I am sorry that I can hardly speak so favourably of them as a whole as I could last year. This is in part no doubt due to a larger number of students having competed with the result of lowering the average. I notice especially many defects in what are almost the elementary rudiments of architecture. The designs to which I have been able to award high marks are in many cases very creditable and well-drawn, and in several instances I have noticed with pleasure that the candidates have availed themselves of the opportunity which the problem afforded them of attempting a little interior design. In conclusion, I consider the planning on the whole better executed than last year. In not a few cases, it is true, the candidates have not shown themselves familiar with obvious matters; some of them, for example, have not provided the rooms of their building with fireplaces, but on the whole they have understood the subject and treated it with intelligence; and many of them have succeeded in giving some amount of architectural character to their plans.

Elementary Principles of Ornament.—The work done for the award of second classes shows that great credit is due to the masters for the excellence of their instruction and for their selection of the pupils for this examination. There is scarcely a single instance of those pupils who are totally ignorant being sent up for this examination. Some of the best candidates examined for the award of first class have attained a high degree of excellence, and, with but few exceptions, those who have passed have done fairly well. Few seem to be aware of the paramount importance of good proportion and graceful outline when these are left to their discretion.

Plant Drawing.—The standard in plant drawing this year is high again, the manner practised throughout almost all the exercises is good, and perception shown in most of them of the object aimed at by the exercise.

Time Painting from Still Life.—The work sent up in this section continues to show considerable artistic perception and ability, though no exercise this year has the charm of aspect of a certain number of works sent up in preceding years. It is satisfactory to see that a simpler and more direct manner of laying on the colour is pretty generally adopted, to the advantage of the work done, and that the profuse use of varnish and a treacley aspect is gradually being abandoned.

Painting in Monochrome.—The results of this year's competition seem to me encouraging. The average level of the work this year struck me as higher than last year. This was especially the case with regard to taste and colour. So far as the technique of painting is concerned, if there was nothing better than the best of last year's work there was certainly less that was very bad. There was still noticeable in the work sent in far too frequent a tendency in the pictorial rather than in the decorative direction.

Time Drawing from the Antique.—The general standard is somewhat lower than in former years. There are no exercises of superior excellence. At the same time the utterly bad are fewer in number.

Time Drawing from the Life.—The average in this section is very much the same as in former years; a greater excellence can well be expected, and ought to be achieved.

Drawing the Antique from Memory.—The examiner has again to express regret at the number of exercises not being greater in this branch of study, considering the very great advantages to be derived from the constant practice of exercising the memory. Of the drawings sent some are fairly good, but more general improvement can well be expected.

Modelling.—We think that the high average of merit reached last year has been maintained in most of the stages this year, though, as before, there are few works that are up to a very high standard of excellence.

The works submitted for the National Competition were examined by the following gentlemen, under the general superintendence of the Director and Assistant Director for Art, T. Armstrong and H. A. Bowler:—Messrs. E. J. Poynter, R.A., G. D. Leslie, R.A., W. F. Yeames, R.A., W. H. Thorneycroft, R.A., J. B. Burgess, R.A., H. H. Armstead, R.A., G. Aitchison, A.R.A., W. Morris, J. J. Stevenson, H. G. Harris, M.Inst.C.E., Walter Crane, Lewis F. Day, T. G. Jackson and Alan S. Cole. The number of works selected for the National Competition was 2,084. The awards consisted of 5 gold, 51 silver and 132 bronze medals, and 262 prizes of books gained by general students, together with honorary awards of 3 gold, 14 silver and 35 bronze medals, and 47 book prizes obtained by students of the training classes of the National Training School. From the reports of the examiners it is only necessary to give here such extracts as are of general interest.

Modelling. — Examiners: H. H. Armstead, R.A., H. Thorneycroft, R.A.—In the models from the life presented this year there is no falling off, but some improvement. The copies from the antique, however, are not considered satisfactory, and the examiners are of opinion that in cases where the example, unlike the living model, may be used for an indefinite time, no

works should be allowed to come up which are not executed with the greatest care and finish. The examiners see with pleasure a notable improvement in the treatment of the living model in relief, and also in reliefs adapted from the round antique figures. It is to be hoped that this improvement may continue and become still more general, for such relief treatment is in the highest degree important in the decorative modelled work which it is especially the function of the Department to foster. In the stages of design there is seen more perception of the limitations of plastic art than heretofore, more skilful execution and more taste in arrangement with, here and there, invention. The busts from the living model are better than usual this year.

Mechanical Drawings.—Examiner: H. Graham Harris, M.Inst.C.E.—Although the number of drawings submitted this year is in excess of that of former years, yet there is no one work which is of exceptional merit, or which shows exceptional ability. The general standard is, however, on the whole, I think, higher than previously.

Painting from Still Life.—Examiners: G. D. Leslie, R.A., W. F. Yeames, R.A.—The examiners are of opinion that in this class of work there is very great improvement. More taste is shown in the choice of material and in the arrangement of it than heretofore, and in execution there is also a marked advance. Many of the studies now presented, to which no awards have been made, would have been thought much of in former years. It is to be remarked that with this general improvement there is no exceptionally brilliant performance such as is sometimes met with. The average is so much better this year that the adjudication was more difficult than heretofore.

Flowers and other Paintings.—Examiners: G. D. Leslie, R.A., W. F. Yeames, R.A.—The examiners note that there is a general improvement in the paintings of flowers; at the same time, one or two pre-eminently accomplished students in this kind of work are unrepresented this year. Generally there is more endeavour to render the light and tender qualities of the colour and surface of flowers, but this is sometimes sought at the cost of careful definitions of form.

Designs, Textiles, &c., Hangings, Carpets.—Examiners: E. J. Poynter, R.A., W. Morris, Walter Crane, Alan S. Cole.—L. P. Butterfield, of South Kensington School of Art, receives a bronze medal for his design for printed hanging. It would, however, have been more suitable for wall paper. Mere ingenuity not resulting in a pleasing whole is of no great value. They are gratified to note that the designs for small cotton prints from Manchester are all creditable and of a higher level than usual.

Damask Table-cloths.—The examiners wish it to be remembered that designing for damask table-cloths is one of the easiest forms of designing. Students would probably benefit by studying heraldic devices of Gothic times in order to realise the value of bold forms and the use of counterchange in two colours. Good napery patterns are to be found quite late in the seventeenth century. A decided improvement in this class of designs by students is apparent this year. The examiners note that the designs sent up for hand-made laces are not good enough for the very elaborate work in their execution. For the most part they are based upon the eighteenth-century patterns, many of which are derived from floral and ribbon designs for woven silks. It is a mistake to suppose that because lace work is necessarily limited by its process of manufacture that it is not to be identified with thoroughly characteristic and suggestive designs. The history of the art during the sixteenth and earlier part of the seventeenth centuries shows that such is not the case, and that it is possible to have good designs in spite of limitations as to method and material.

Wall-papers, Tiles, Mosaics, &c.—Examiners: W. Morris, Walter Crane, Lewis Day.

Wall-papers, &c.—The designs for wall-paper are on the whole remarkably poor this year.

Tiles.—The designs for tiles are good this year. It is a vicious practice to form patterns of animals in such a way as to make it difficult to note their real forms. Animals should not be turned into geometrical units.

Stained-Glass.—The examiners have to record that the stained-glass designs are poor, the majority of the designs showing little understanding of the requirements and technicalities of the process.

Designs for Pottery, Metalwork, &c.—Examiners: W. Morris, Walter Crane, Lewis Day.—With the exception of a hand mirror and a jewel casket the general run of designs for metalwork is faulty in style and somewhat wanting in originality; in other cases a great deal of labour has been wasted in inorganic and inappropriate ornamentation.

Antique Figure and Details, Drapery, &c.—Examiners: W. F. Yeames, R.A., J. B. Burgess, R.A.—The examiners think that generally there is some improvement shown in the works sent in this year in this stage, though there is nothing very good calling for special remark; neither is there a vicious tendency, but the work is fairly good all round. Among the drawings of hands and feet there are none of great merit.

Drapery Studies.—In the class of draperies on the cast the examiners see improvement.

Painting and Drawing from Living Model, &c.—Examiners: W. F. Yeames, R.A., J. B. Burgess, R.A., and E. J. Poynter, R.A.—Generally the painting from the life is not considered up to the usual standard. There is a tendency to loose, slipshod work, which the examiners regret.

Drawing of Full-length Figures (Life).—A very slight and sketchy manner, which leads to nothing, is in the opinion of the examiners becoming much too prevalent in some of the schools, and should be checked by the masters. A silver medal is given to a thoroughly well-studied, careful drawing by Renira Pollard, of South Kensington, and another to T. Stokes, of West Bromwich School of Art for a drawing from a model whose forms are unhappily meagre and poor. It shows evidence of careful study. In the National Art Training School, where good models are available, more care should be taken in the selection of them. There is a fresh tendency among some of the students to a rather loose kind of work, which ought to be discouraged. A silver medal is awarded to Harold Speed for a drawing with refined and tasteful treatment, wanting a little firmness, especially at the joints. The drawing by Albert Baker, which has a bronze medal, is good in action and vigorous in treatment, but somewhat smudgy. A silver medal is awarded to H. C. Fripp for a work which, though large in treatment, is carefully done. Although there are no drawings considered of high quality, a considerable number of fair works in this class have been sent up in which the *ensemble* of the model has been happily seized.

Time Studies from the Life.—The large set by A. Allan, of Glasgow School of Art, receives a silver medal. These drawings are of a very useful kind, and executed in a good manner, and the examiners are glad to note the attention he has paid to hands and feet. G. Davies, of Leicester School of Art (Hastings Street), for a set somewhat less good, receives a bronze medal. The drawings from National Art Training School in this stage are considered very good.

Painted Studies of Heads (17b).—These are poor. In this class there is a half-length figure of an old woman which has very good quality as to colour and value. There is another study of an old woman at work by a window which has similar qualities, but the examiners hardly look upon this as proper schoolwork. The heads from the training class are better.

Chalk Drawings of Heads.—Many of the works in this class are in the sooty manner so strongly protested against by the examiners in former years. There are no studies of hands and feet so good as those of former years.

BRISTOL CATHEDRAL.

THE death of Dr. Gilbert Elliot, Dean of Bristol, has inspired various biographical sketches. It was stated in most of them that the Dean was the chief promoter of the restoration of the cathedral, which he placed in the hands of the late Sir Gilbert Scott. It is needless to say the restoration was Mr. Street's work, and that some of the sculpture gave rise to an angry controversy. A correspondent of the *Times* claims the credit of originating the restoration for the present Archdeacon of Bristol, Canon J. Pilkington Norris. The writer says:—On Mr. Norris's appointment, in 1865, he not only found Bristol Cathedral naveless—the fourteenth-century rebuilding, for which the Norman nave had been demolished by Abbot Knowle, having come to a standstill when barely begun—but a negotiation between the Chapter and the Municipal Corporation of the city all but completed for the sale of a long slice of the site of the nave for the widening of the road, which would have absolutely prevented its ever being rebuilt. This transaction Canon Norris refused to sanction. The Chapter had gone too far to recede; but Canon Norris at once waited on the Council, showed them, to their astonishment, that the completion of their mutilated cathedral would be foreclosed for all time if the plan proposed was carried into effect, and had little difficulty in inducing the Council to rescind the agreement with the Dean and Chapter, and alter the line of the street so as to preserve the cathedral ground plot intact. Having thus secured the site of the nave, Canon Norris at once inaugurated a plan for its rebuilding. The Dean had wished for nothing more than the erection of a western porch or narthex, covering a small portion of ground; but he interposed no prohibitive obstacle to his canon's "wild scheme," and with his sanction and that of the Chapter Canon Norris obtained a design from the late Mr. Street and vigorously set about the task of raising the necessary funds. The matter was warmly taken up by the city and diocese, and we see the result in the fully-completed nave, with its western towers and elaborate north porch, the gift of the then mayor, Mr. Killigrew Wait. The first stone of the new nave was laid in April 1868, and it was opened for worship on October 23, 1877. The towers, one commemorating the episcopate of Bishop Butler, have since been raised to their full height. No injustice is done to the memory of the late

Dean by saying that he held himself entirely aloof from the rebuilding of the nave until it was all but completed. At that time a painful controversy regarding some statues of the "Fathers of the Church" on the north porch, which had disturbed the Protestant sensitiveness of a portion of the inhabitants of Bristol, which it is wisest now to forget, led the Dean for the first time to show any public interest in the work, and after the removal of the images which were the cause of offence he exerted himself energetically for its completion. But it is the simple truth that he was in no sense the originator or the chief promoter of the rebuilding.

Another misstatement deserves to be corrected. Whether Dean Elliot ever applied to the late Sir G. G. Scott for advice as to the restoration of his cathedral I cannot say. But that celebrated architect was never employed on any part of the building. The alterations referred to in the obituary, undertaken when there was no idea of rebuilding the nave, between 1861 and 1864, were carried out under local architects, Messrs. Pope & Binder. Much has been learnt as to cathedral arrangement since that time, and the wisest course for the new Dean, when appointed, to take would be at once to undo all that was then done, and treat the choir as a choir and not, as now, as a nave and choir in one. In the hands of a Pearson, a Blomfield or a Hodgson Fowler, Bristol Cathedral may be made one of the most beautiful churches in England.

AN EPISCOPAL VIEW OF RESTORATION.

THE opening address in the Architectural Section of the Congress of the Royal Archæological Institute at Edinburgh was delivered by the Bishop of Carlisle. His lordship said it had occurred to him, in considering upon what string he could most conveniently hang together some introductory remarks, that he might with advantage direct their minds to the subject of the treatment of ancient buildings. It would be remembered that although architecture was the subject which was to be dealt with in that section, it was not architecture pure and simple, but architecture in its relation to archæology. The most recent form of architecture was that adopted in the construction of the Forth Bridge, but he feared that he should have to rule a paper upon the architecture of the Forth Bridge out of order as not being connected with archæology. Ancient buildings alone were admissible into the discussions of that section, and some remarks upon the manner in which they should be treated might, perhaps, not be without their use. The first method of dealing with ancient buildings, and one which would probably be recognised as an important one by archæologists, was to leave them alone. Perhaps in some cases that recipe required to be applied in conjunction with another, viz. to take care that other people left them alone also. There were cases in which these two methods of treatment ought to be applied in the most rigorous and literal manner, and in which nothing more ought by any means to be done. They might take as a primary example some of the buildings of Egypt, buildings which combined in the most marvellous manner the reality of almost immeasurable antiquity with some of the appearances of the freshness of recent work; buildings which were the archæological heritage of the whole civilised world, but in which, according to the eccentric course of human affairs, this country had at present a special interest, combined with a special responsibility. He presumed that no one was likely to attempt to "restore" any of the Egyptian temples; to let them alone would probably be the universal notion of what was best for buildings such as those, though it might be well to add that the other consideration must not be omitted, viz. that care should be taken that others left them alone too. It was not pleasant to find that there was some fear lest national jealousies should prevent that absolute care for the safety of Egyptian monuments which all right-minded men desired. Archæology knew, or ought to know, no distinction of race. It mattered not whether the chief post was allotted to a Frenchman or an Englishman, provided only that there was some one who was endowed with real power, and who was competent for the work. He ought to qualify what he had said concerning the propriety of leaving such monuments as those of Egypt alone, by adding that of course care should be taken to guard against those causes of decay which existed even in Egypt. The remarks made concerning Egyptian architecture manifestly applied to countless other works in all quarters of the globe, not by any means excepting this country. In fact, wherever there was an ancient piece of architecture which had become a monument of the past pure and simple, there could be no question as to the method of treatment. Either it should be left alone, or, if that was impossible, such steps should be taken as would avoid its destruction, was the precept to be given. One difference between this country and Egypt was that in Egypt danger arose from the want of a master, or owner, with plenary powers; whereas in England the opposite peril arose, and a monument was sometimes placed in jeopardy by the fact that some one could prove to the satisfaction of the Law Courts that the monument in question was his in fee simple. So much for edifices which might be regarded as monuments pure and simple. It was far more difficult to define the proper method of treating buildings which were partly monumental, but partly also in ordinary use for the practical purposes of living men. Obvious examples were to be found in that city—Edinburgh Castle, Holyrood House, the church of St. Giles. He imagined also that in Holyrood House the *juste milieu* between leaving all alone and leaving nothing alone had been wisely kept; and though the change in St. Giles's Church from what it was in his own recollection had been great, perhaps even radical, still he thought that Jenny Geddes herself, if her spirit still haunted the scene of her great ecclesiastical achievement, would be disposed to grant that the change was "no so very bad." The fact was that the problem of dealing with ancient buildings which were still serving contemporary living purposes must of necessity be very puzzling, and in some cases perhaps actually impossible. Of one thing the architect might rest assured, that whatever course he adopted he would be severely taken to task, partly perhaps by men of his own profession, and still more confidently by that remarkably dangerous and inevitable person, the infallible amateur. There was perhaps nothing easier or cheaper than giving advice on a subject which one only imperfectly understood. His lordship illustrated the difficulty of which he was speaking by reference to the problem of dealing with Westminster Abbey consequent on the filling up of the Abbey with monuments and statues. A deadlock had been reached after full discussion and deliberation by six persons, presumably amongst the most fitted to discuss and deliberate in the whole kingdom. The most familiar and ordinary example of a building which was monumental, and something more, was to be found in the parish church. In Scotland the example of St. Giles's, of the Cathedral at Glasgow, and other interesting and beautiful churches here and there still used for divine worship, would show that a Scottish architect might sometimes be called upon to rack his brains in order to discover what was the treatment of any given building which should at once recognise its character as a monument to be conserved, and a contemporary building to be used. What he desired to press was that both these sides of the question must be considered. He must content himself, however, with asserting the living character of churches for the present era without endeavouring to indicate the manner in which this character was to be reconciled with the other, which presented them to us as precious monuments of a past we did not wish to forget. He had thus dealt with ancient buildings as divided into classes; those which were purely ornamental—the class most dear to the archæologist's heart, and those which, while partly monumental, had, nevertheless, living uses which the archæologist was at least compelled to tolerate. But this second class admitted of a subdivision which ought not to be neglected, because it, in fact, pointed to one of the most difficult questions presented to those who had in any way to deal practically with ancient buildings. He referred to the fact that many, perhaps the majority, of ancient buildings were the archæological records, not of one, but of several historical epochs. He was himself for more than ten of the best years of his life the custodian of such a building. Ely Cathedral, like most of our great churches, was not built by one architect or even by one generation. It was a monumental record of all periods since the Conquest, and it contained beautiful specimens of all schools of architecture—Norman, Early English, Decorated, with just a flavour of Sir Christopher Wren. When a building of that kind had to be meddled with—and meddled with it sometimes must be, let the advocates of leaving old buildings alone say what they would—most perplexing questions would necessarily arise. If they are dealing with a building which had one date, one style of architecture, one design, it was comparatively easy to put themselves in the position of the original architect, and to try to do what they thought he would have done, but this method obviously failed in the case of a building the history of which spread over centuries, and which was the result of the plans of architects who followed the admitted rules and methods of the days in which they lived, and who, it might be added, sometimes cut into each other's work with no fear before their eyes of a Society for the Protection of Ancient Buildings, and with no Lord Grimthorpe to tell them what was right and what was wrong. What was the modern architect to do? There had been no unbroken continuity of ecclesiastical architecture; there was a great gulf between the modern architect and the builders of our great cathedrals. "Apparent rari nantes in gurgite vasto"—Rickman striking out bravely at the head of them; Pugin, Butterfield, Scott and others doing their best to follow; but there had been a shipwreck after all; and the methods of church restorers for some time after the modern renaissance had marks of salvage from the wreck—if, indeed, such marks had altogether disappeared even now. It would not be suitable to attempt a solution of the difficulties the existence of which he had thought it right to indicate; in the interest of archæology, however, he would venture to insist

upon two principles—(1) that the rule of leaving alone whatever existed in ancient buildings should be followed as closely as the condition of things, in any given case, would allow; and (2) that care should be taken not to introduce new work so carefully and even slavishly copied from the old, as to lay a snare for the feet of future inquirers. For his own part, he believed—and he quoted Ely Cathedral in support of his opinion—that it was possible to introduce new work into juxtaposition with old, without, on the one hand, any sense of incongruity, or, on the other, any indication of weak and foolish copying. Perhaps, in archæological architecture, as in politics, a brave originality was not only consistent with, but was the wisest and safest outcome of, a true and wise conservatism. In closing he would say that from the archæological point of view they might rightly divide ancient buildings into two great classes—the dead and the living. Of the first class he would say—Leave them alone, or else they should be only so far meddled with as to prevent mischief, and to hand them down uninjured and unaltered to posterity. The second class, too, must be conserved, but it could not always be on the plan of letting them alone; and therefore the architects who should be called to deal with them should be, politics apart, profoundly conservative. They ought to be learned and skilful in order that they might see their way as to the best thing to be done. Further, they ought to be patient, good-tempered, long-suffering, because they were sure to be pelted with abuse whatever course they took. It was to be hoped that the backs of architects were suited to their burdens, and that men would always be found having the natural and acquired qualifications necessary to deal with ancient buildings wisely, cautiously, kindly.

Mr. J. T. Micklethwaite, in proposing a vote of thanks to the Bishop of Carlisle for his address, took occasion to say that, with respect to the question of dealing with Westminster Abbey, the Commissioners were absolutely unanimous on one point, namely, that of leaving the building alone as it had come down to us. One point about the buildings still in use might be put very shortly, and that was that in altering a building the restorers must alter it for their own use. The real mischief had been, not that the restorers had been trying to make the buildings more fit for use, but that they had been putting them back into some past condition which did not make them more useful than before.

Dr. Rowand Anderson, in seconding, said he was sure that the bishop's words would give the greatest encouragement to all who were engaged in restorative work, and would tend to soften much of the bitter criticism that was poured out on the heads of unfortunate architects. One view he would like to press was that the restoration of buildings as we now understood it was entirely a thing of the present day. He was sure that if a society for the protection of ancient buildings had existed in the old days it would have had a very rough time of it. Architects in those days did not preserve. He was afraid they destroyed a great deal. In dealing with buildings at the present the architect was bound, as far as possible, to continue their history, and not to make slavish imitations amounting almost to forgeries.

The Rev. Dr. Cox expressed the hope that the result of the drawn battle between the Commissioners in regard to Westminster Abbey would be that for many years the Abbey would be spared as it was. He emphasised the great danger that would result from a call upon the nation to vote any great amount of money towards the building of a new chapel. The result would be a sort of popular control which would ruin very much of the sacred halo that now attached to the building.

The Bishop of Carlisle acknowledged the vote of thanks.

SURREY ARCHÆOLOGICAL SOCIETY.

THE recent excursion of this Society was to Charlwood, Leigh and Reigate, and was attended by upwards of fifty members and their friends, including many ladies. Assembling at the railway station at Redhill at noon, the party proceeded in carriages to Charlwood, where Mr. J. L. André, F.S.A., read a paper in the church descriptive thereon. He said the church was not mentioned in Domesday Book, but there certainly was an ecclesiastical building existing when the account of the Taxation of Pope Nicholas IV. was compiled in 1291. The living before the Reformation was in the possession of Christ Church, Canterbury, after which it passed into the hands of various families, that of Trix being the present owners. It is a peculiar of the see of Canterbury. Many of the registers are in excellent penmanship, and they commence in the year 1591. Mr. André then described the edifice, especial attention being directed to the very beautiful screen, probably the gift of Richard Saunder, whose initials appear upon it, with the arms of his family and that of the Carews. Mr. André next pointed out the curious paintings still remaining on the south wall, and which were laid bare by the late rector, the Rev. Thomas Burningham, in 1858. These paintings formed the subject of a very interesting paper by the late Mr. William Burges, published in the *Archæological Journal*. In this paper Mr. Burges said, "Unfortunately only two bays are preserved, one on the east and another on the west of a two-light Early Decorated window. The eastern division contains three bands, the westernmost only two, thus carrying out the principle of increasing the decoration as it approached the east. The eastern bay is occupied with the history of St. Margaret; the arrangement of the subjects corresponding closely with the illuminations in a nearly contemporary MS. in the British Museum, commonly known as Queen Mary's Psalter." Mr. Burges then describes the story of St. Margaret. The western bay has only two bands, and it evidently contains the story of St. Nicholas, the patron of the church, and the Mediæval allegory of "the three living and the three dead." Mr. André next described the brass still existing on the south wall of the present chancel, and which is in memory of Nicholas Saunder and his wife, the date of the memorial being 1553; and a few words on the monuments of the Jeale, Jordan and Sharp families concluded the paper. Mr. Wilkins's house, near the church, was next visited and described by Mr. Ralph Nevill, F.S.A., who said that the building was a very interesting specimen of an old English house of the time of Queen Elizabeth, unusually complete in design and apparently all of one date. The old table, recently removed, had sinkings in it to receive the salt. Having explored the house, the company was next driven to Leigh, where, in the parish church, Mr. Mill Stephenson, F.S.A., hon. sec., in describing it, read some notes by Mr. F. C. Lees, who restored the church some time ago. The existing building dates from the fifteenth century, when the old church must have been almost entirely rebuilt. The stained-glass windows in the chancel contained some very fine modern glass, the gift of Mr. John Watney, F.S.A., a member of this Society. Leigh Place was next visited. This was a fine old house surrounded by a moat; inside it had an interesting old hall with an immense fireplace, while upstairs there is an antique mantelpiece bearing an inscription said to have been written by some prisoner or priest hidden there. During some alterations, with a view to modernising the house, a silver cup, 200 years old, containing coins, was found concealed in the plastering, and some swords and armour were taken out of the moat, supposed to be the result of skirmishes in the time of the Commonwealth. Mr. John Watney, F.S.A., here read notes on the history of Leigh Place and of its former owners.

The members and friends were next driven to Reigate, and arrived at the ancient castle and caves during a thunderstorm, and it was interesting to listen to the phenomenon of muffled thunderclaps and storms overhead while twenty or thirty feet below in the caves, which could be distinctly heard during the reading of a paper on the history of Reigate Castle by Mr. Mill Stephenson, in the absence of the author, Mr. Granville Leveson Gower. In his paper Mr. Gower said there were no remnants of the old castle now to be found. Generally speaking, when an ancient castle was demolished, the old castle well still remained to mark the site; but in the case of Reigate he (the author) had failed to find the well, and he would be glad if anyone could indicate to him its position. For the purpose of the visit the Mayor and Corporation of Reigate had admitted the members and friends to the caves free, and they were illuminated by the head gardener, Mr. A. J. Jeal, with upwards of forty lights.

The entire party next proceeded to Reigate Church, which the Rev. J. W. Pickance described, with its monuments.

At the White Hart Hotel, Reigate, the members and visitors sat down to a collation. Mr. John Watney, F.S.A., presided. Besides those whose names we have mentioned, there were also present the Rev. R. M. Blakiston, Rev. T. S. Cooper, Messrs. A. J. Style, S. W. Kershaw, M. Pope, C. H. F. Lewes, W. F. Potter, J. Bowyer, T. F. Peacock, W. P. Ivatts, &c., and many ladies. Replying to the toast of "Success to the Society," Mr. Mill Stephenson (hon. sec.) said the Society was continuing to flourish financially and in numbers, and he hoped to have a new volume of the "Transactions" of the Society in the hands of the members in the course of a week or so.

THE GREEK STAGE.

A PAPER on the "Vitruvian Account of the Greek Stage" was read by Mr. Louis Dyer, delegate from the Archæological Institute of America, at the meeting of the Archæological Institute in Edinburgh. The general drift of Mr. Dyer's argument was that the contradictory accounts of Vitruvius as to the component parts of the Greek theatre were not to be relied upon in view of modern research, and especially of the discovery of a very complete ancient theatre at Epidaurus. The Chairman, in inviting criticism of the paper, suggested that perhaps Vitruvius, like some modern young men, had too much Chian wine when he went to the theatre. If any one, he said, could give any explanation to save the character of Vitruvius

they should be glad to hear it. Dr. Evans instanced this as a case in which archæology had come in to aid history. It appeared to him that if they had facts at their command they were to be taken as interpreting, and, if necessary, controverting, what came down to them in the history of Vitruvius. He moved a vote of thanks to Mr. Dyer. Professor Clark, in seconding the motion, said that, in his view, Vitruvius had stated two absolutely contradictory sets of facts.

THE SOUTH KENSINGTON MUSEUM.

THE late Sir Prescott Hewett, F.R.S., the surgeon, having expressed a desire that part of the collection of water-colour drawings which he had formed should find a home in the galleries of the South Kensington Museum, to which he had been a constant visitor, his children, Miss Prescott Hewett and Mrs. Hallett, have now given effect to his wishes by offering a selection of fifty of the best and most representative works by various artists, several of whom are at present unrepresented in the historical collection at South Kensington, with one of Sir Prescott's own drawings, to the Lord President of the Council, by whom, as *ex officio* trustee, they have been accepted. The terms of the deed of gift are much the same as those under which the late Mr. Sheepshanks gave his celebrated gallery of pictures to found a National Gallery of British Art at South Kensington in connection with the Museum and School of Art.

THE SANITARY REGISTRATION OF DWELLINGS.*

THE purpose of this paper is to enforce the view that all dwellings hereafter to be built and certain classes of dwellings already erected should be provided—first, with a system of house drainage so arranged and constructed as to guard the inmates from the noxious influence of so-called sanitary appliances; secondly, with a protected indoor water supply as distinguished from a wholesome supply at the fountain head; and lastly, that the dwellings referred to, when so provided and on production of a sanitary certificate granted by competent authority, should be entered in some competent register.

It cannot be denied that the existing legislative provisions as to house drainage and water-supply protection are insufficient to maintain the degree of safety necessary for preserving health, and although other matters appertaining to house sanitation deserve consideration, the two subjects mentioned demand urgent attention, and ought to be dealt with more effectively by competent authority. While adequate ventilation of a house, inodorous surroundings and other matters are of considerable importance, many of them are largely dealt with by existing law. Further, there is this marked difference between some of these useful requirements and those specially pressed by this paper. Bad ventilation and ill-placed dustbins are obvious defects, the purchaser or hirer of a house cannot say that he is misled or deceived, and the maxim *caveat emptor* applies. But with regard to faulty arrangements in the domestic closets and waste pipes and defective and ill-contrived water-cisterns the case is different. The offending point may be discoverable only by the observing powers of an expert or may be concealed from every one until revealed by illness or the breaking up of a building. The mischief is insidious, and as the emanations from sewer connections are of serious consequence to inmates of dwellings it seems only reasonable to draw a distinction between the open and obvious defect and the insidious approach of a concealed danger, and to urge that to meet this danger Government action may be properly invoked.

It is no doubt true that existing law provides that water-closets or equivalent arrangements shall be supplied and that drainage shall be attended to, and it is also the case that under certain circumstances and after certain formalities, entrance of officials into occupied dwellings is authorised to ascertain that the necessary sanitary conveniences have been provided. But it does not appear that a faulty construction of such appliances can be dealt with unless the fault is glaring and the evil therefrom amounts almost to a nuisance to outsiders. In order, therefore, to enabling intending occupiers of new dwellings to be saved from injury it is essential not only that these should be provided with the usual appliances, but that they should be inspected and pronounced good in themselves and suitably adapted to those dwellings. For otherwise the mere requirement that domestic conveniences shall be provided almost amounts in many cases to a statutory obligation to undergo illness or suffer death.

In regard to the water supply, the point now urged is that water for drinking should be protected after its introduction to the house, for obviously, however good it may be at the fountain head, this is of little advantage if it become affected by pollution within the walls of the dwelling. Protection from this should be insisted upon both as regards possible contamination by emanations from discharge pipes and also as regards the position of the drinking-water cistern, so that it shall not be a receptacle for dust or inaccessible for purposes of investigation or periodical cleaning.

With regard to existing dwellings, however, the difficulty of rigorously enforcing such requirements is very great. To insist upon all such buildings being brought at once (even if it were practically possible) to the ideal standard of sanitation would, by reason of the heavy cost and the occasional disarrangement of the buildings, prove an unreasonable demand upon the resources of individuals. But it is conceived first that, without in such cases quite approaching the ideal standard, a minimum standard might be adopted which would still be of considerable sanitary value. Next that the lower standard might be enforced after the completion of a long tenancy or period of years.

As to water, however, whatever minimum of house sanitation experts might consider sufficient, I trust it would not be deemed too severe a demand if, as to protection of drinking water, there should be but one standard.

In regard to the use of the word "dwelling," the term is here intended to apply both to residential houses and to all buildings wherein human beings are employed or engaged for any number of consecutive hours. It is not forgotten that the present law, by the Factory and Workshop Acts, the Common Lodging Houses Acts, and others, deals with numerous special cases, and that already some overlapping occurs. But for the purpose of this paper there is much ground that those Acts do not cover, and when such statutes are in effective operation it is not proposed that they should be interfered with by further legislation. It has been stated that with existing dwellings a different standard of sanitation might be accepted and time given for its adoption. With regard, however, to certain classes of such dwellings, I would urge that legislation should at once intervene. I refer to the cases of hotels and lodgings and to Board Schools and other institutions under local control.

The reason for demanding the sanitation of such existing buildings is, that with hotels the public have not always the opportunity of choice. Arriving from the country or from abroad, the stranger in a town must go to such quarters as are available, and the very purpose of hotels is to provide accommodation for travellers who of necessity can know nothing of the arrangements of a dwelling within whose walls they may, under the greatest urgency, be bound for a time to reside. And when we know that, perhaps at home, and certainly abroad, the traveller's life has been cut short by insanitary conditions of hotels, it does not seem much more unreasonable to demand protection from such evils than to insist that for some hours daily there shall be no sale of alcohol.

Lodgings, though not quite in the position of hotels, are included therewith because where the business is a regular occupation the functions of the lodging-house are very similar and the position of the guest almost equally defenceless.

Board schools are placed in the same category, because attendance of the children is compulsory, and they neither know nor care about sanitary arrangements. As to the parents they are probably altogether excluded from an opportunity of inspecting those departments, and it is quite possible that even if it were granted and the condition of affairs were grossly unsatisfactory the parents would come to the conclusion that, in comparison with their own, the arrangements were salubrious and even attractive.

It may be urged that the compulsory action suggested is, in the case of public institutions, nnnecessary and vexatious. Without saying that my experience of such cases is extensive, I can state that instances of a very gross character have occurred. Where, in very large buildings under the control of a School Board, the sanitary arrangements had been pronounced faulty and dangerous to health, and several deaths had ensued therefrom, the Board nevertheless failed to take such action as was necessary, and the schools were after the holidays re-opened on the alleged ground that there had not been time or it was not then convenient to carry out the operations so imperatively required.

To an audience of this character it would be vain to attempt be reciting sensational cases to enlist their sympathies convincing their reason, but certainly it would not be difficult to illustrate the point at issue by other examples of grievous suffering and distress inflicted upon the young, the weak and the helpless.

We have now to inquire as to the sanitary registration of the buildings referred to. It is conceived that the best mode of enforcing the observance of sanitary regulations is to establish a public register in which to enter a reference to every building which has complied with such regulations, and to provide that

* A paper by Mr. Henry Rutherfurd, barrister-at-law, delegate from the Sanitary Assurance Association, read at the International Congress of Hygiene and Demography.

no buildings should be inhabited until so registered. The registration would be effected on production of a certificate of due sanitation from some competent authority. Then inasmuch as the sanitary condition of a house may vary with lapse of time, it is proposed that quinquennially an inspection should be made, and the fact, if all be found in order, endorsed on the certificate. But if any discovered evil should within a certain period not be remedied, the house would then at once disappear from the register. In the case of change of tenancy during the quinquennial period, or structural alterations endangering the sanitary arrangements, it should be obligatory on the house owner to obtain inspection and notify results to the sanitary registrar.

In this connection it would be well to consider whether encouragement should not be given to the voluntary sanitation of dwellings, for the time being excluded from compulsory regulations, by entering them in the register when duly certified, on such easy terms as to fees and otherwise as might be thought expedient. It is probable that many house proprietors would be willing and eager to conform to such modified regulations with the view of attracting tenants, or securing more remunerativo rents, the result in either case being to the benefit of society at large.

The question still remaining is that of the persons or parties competent to issue the sanitary certificates. Whilst admitting to the full that the educated official persons at present in charge of the public health are competent and desirable authorities to grant such certificates, it is considered that the power in question ought not to be confined to the officials of the State. Sanitary science is still young, and it may be that progress would be more surely made by extending the power to certify to such medical men, architects, engineers or associations as have themselves, or through their staff, recognised diplomas of sanitary knowledge. Just as under the Vaccination Acts, while the act of vaccination is often performed by official persons, the statute may be complied with through means of other persons, provided they are qualified by diplomas of recognised validity.

It is not denied that some difficulty may arise on this part of the subject, and the limits allowed will not permit of its being fully dealt with. But it may be suggested that the reckless or fraudulent issue of certificates could be met by severe penalties, while the offenders would still be left open to the public trial of a civil action for damages at the suit of any injured party.

Lastly, although the measures recommended in this paper may not be "heroic," it is submitted that they are worthy of consideration, and that their adoption would to no inconsiderable degree work for the general good. In asking for State interference, it must be remembered that we are making fresh invasion on private liberty, and we ought not to extend this invasion further than is absolutely necessary. Also, the theoretical sanitarian is bound to consider what are the prospects of passing ideal schemes into effective law. The insistence of a very high standard may lead to immediate failure and possibly to a disastrous postponement. On the other hand, there can be no doubt that if, by the limited scheme here presented, dwellings should be provided with appliances of the character specified, examined in their respective positions and periodically supervised, a great improvement would be conferred upon the habitations of the people, slow and lingering disease would be diminished, the tone of the general health would be raised, and something will have been done to increase the happiness of many an individual home.

SILCHESTER.

THE traveller who leaves the Great Western Railway at the little station of Mortimer, half-way between Reading and Basingstoke, and walks for some three miles south-westwards through pleasant Berkshire lanes will reach, says Mr. F. Haverfield, in a communication to the *Manchester Guardian*, just on the border of Hampshire, the solitary church and manor-house of Silchester. As he turns on his right hand through the farmyard of the manor, he finds himself in an open space of some two hundred acres, in shape an irregular heptagon, spread out on a hill which slopes gently to the south. Round it, in a circuit of a mile and a half, runs a grassy bank crowned with a hedge which shows half-hidden beneath it the ruins of an ancient city wall. The enclosure itself is a waving cornfield, broken here and there by hillocks of upturned earth or clearings made by excavators' spades. In the clearings are faint traces of buildings—low flint foundations of houses, tiling, pavement, with shattered fragments of pottery that meet the foot at every turn. Three modern huts preserve some of the ancient relics found by explorers at various times, worked or carved stone, the Doric capital of a column, bits of Purbeck marble with a few letters testifying to an inscription, and besides these, tiles and pottery of every sort, coins, iron and bone tools, and all the smaller furniture of Roman life. Close by workmen are busy in driving trenches, tracing foundations, sorting *débris*; and the inquirer will be told that the Society of Antiquaries, the leading archæological society of England, is promoting the continuance of the excavations begun by earlier workers.

Such is Silchester as a visitor might see it to-day, and if he be not a professed archæologist the sight may not a little amaze him. Why, he may ask, should the Society of Antiquaries trouble to collect money and tell off one of its most competent members to superintend the uncovering of this great cornfield? Pottery and coins, bricks and tiles, are common enough, and though some more precious finds are not to be seen on the spot, they include little beyond three or four inscriptions and a small bronze eagle, thought to have been once the ensign of a Roman regiment. History is silent about the town. What interest, then, attaches to this particular hillside, which has yielded so little that is rare, and on which hardly one stone is left upon another? The answer to the question is twofold. In the first place, the site is famous—the most famous, perhaps, of all the sites which were inhabited during the centuries of Roman dominion in Britain. This fame is not due to any special discoveries; it arises very largely from a tendency which characterised the work of English archæologists in the seventeenth and eighteenth centuries. These men did not trouble themselves very much with actual remains; they had, indeed, comparatively few remains of the Romans in Britain with which to trouble themselves. Instead, they followed Leland, earliest of English antiquarian writers, and devoted themselves to the study of roads. As starting-point they had a road-book of the Roman Empire, compiled perhaps in the third century, and known to specialists as the Itinerary of Antoninus, and they sought to fix the roads and halting-places catalogued in this work. They have not been very successful. Eager eyes have seen *viæ* and *stationes* in strange places, and the error has been increased by the ingenious Bertram, who compiled and published as antique an itinerary of Roman Britain which seems even yet to find credence in some minds. But where discretion failed enthusiasm abounded, and every spot where Roman roads are visible or the road-book can be applied has been the object of profound attention. Silchester is pre-eminently such a spot. Roman roads meet there—real Roman roads; the road-book mentions it under the name of Calleva, and it has the peculiar merit of ancient and extensive walls. What wonder, then, that it has become the El Dorado of our antiquaries, that excavations began there sixty years ago, and a German scholar of some note has actually crowned its fame by imagining it to have been an important fortress? What wonder, too, that the Society of Antiquaries should devote the first-fruits of their new Research Fund to this famous ground? But there is another and better reason for the excavations. If the great reputation of Silchester is based on bad reasons, the city has still, in all seriousness, real claims on our attention. The Romans built the existing walls, but they built inside a circle of earlier Celtic earthworks. We are on the site of a British town, perhaps a capital of some tribe in pre-Roman times, the town, perhaps, which coined the curious British gold pieces stamped with the superscription CALLEV. And though this Celtic town has vanished, save for faint traces of its earthworks, its site supplies us with evidence about the Celtic population under Roman rule. The exploration of Silchester resembles the exploration of Cranborne Chase, lately achieved by General Pitt-Rivers. There the minute examination of a poor pit village told us how the villagers lived in Dorsetshire under the Roman government. Here we shall learn the condition of the townsfolk as they were in a town of some size which yet was neither a privileged "colony" like Colchester nor a great garrison like Chester.

As yet the excavations are incomplete, but something may be ventured, though it is as much prophecy as knowledge. The town, which is being slowly uncovered for us, possessed a forum, or what did duty for a forum, with a set of buildings round it, covering in all two acres. Chief of the buildings was a hall of some sort, called by archæologists a basilica—a large edifice, to judge by its ground plan, for it was some 270 feet long. This was the centre of the town, and private houses, temples and baths lay around. The streets ran, it would seem, at right angles. Silchester must have resembled Mannheim, where you can stand at any corner and see the city's limits in four directions. Two temples have been found near the eastern gate, testifying to former glory by Purbeck marble wall linings and vestiges of colouring. A third temple lay south of the forum, and beyond it were perhaps the baths. The private houses, so far as they have been unearthed, are of moderate pretensions. They had mosaics and heating apparatus, but the mosaics are somewhat plain, and the rooms somewhat small. They were not in continuous rows; each stood, it may be, in its own garden, and if the results yet reached are typical of the results to come, Silchester must have resembled a Withington rather than an Ancoats. A considerable portion of the place, at any rate, was not thickly populated. The foundations of the houses are often of flint, and the superstructure was often perhaps of wood, while upper storeys were rare. Except from these things, it is hard to get evidence about the wealth of

the inhabitants. The smaller objects lately found are not uninteresting—there is a remarkable series of carpenter's tools, rescued from a shallow rubbish pit—but they do not reveal secrets. Were it not for the basilica and forum we should rate the civilisation of the place comparatively low. It may be that further search will reveal further wealth. The work is being done with great care and under most efficient control, and may fairly count as an undertaking of the first importance to archæologists.

ENGLISH ISOLATION HOSPITALS.

A PAPER was read by Dr. Thorne Thorne at the Congress of Hygiene, in which he offered some suggestions respecting isolation hospitals. An unoccupied zone of 40 feet, he said, should surround the hospital buildings; each disease should be treated in a building aerially distinct from any other; the wards should have means of cross-ventilation; and in allotting a space of some 2,000 cubic feet per bed, care should be taken to give at least 12 feet of wall-space to each bed, for it was on a level with the patient's lungs and mouth that it was so essential to secure wholesomeness of air breathed. As a rule, one bed per 1,000 of the population sufficed for the current permanent requirements, and no district should be content unless a few cases of two different diseases in both sexes could be simultaneously isolated. Much depended for success on the character of the hospitals. Unless they are reasonably attractive in style, and well designed for purposes of recovery, that immediate isolation which is above all things necessary is not attained. It is not the poor man who, when suffering from infectious disease, constitutes the greatest danger to the community. It is such as the milk-vendor's, the draper's, the publican's family, namely, those who, through their wares and otherwise, tend to scatter infection, that are above all a public danger; and they must be attracted by a building where there is reasonable comfort and the best chances of recovery.

SCHOOL BUILDINGS.

Ruthin.—New grammar schools have just been opened at Ruthin by Sir Wm. Hart Dyke. The cost of the work has been about 7,000*l.* Messrs. Douglas & Fordham were the architects, and Mr. Tom Browne, of Chester, builder, carried out the works, Mr. H. A. Davis being clerk of works.

Rowley Regis.—New schools erected by the Rowley Regis School Board at Macefields, Old Hill, have just been opened. The total cost of the buildings, exclusive of the site, is 3,500*l.*, and accommodation is provided for 460 children, but the buildings are so constructed as to be capable of future extension to make provision for an additional 140 children. The schools are built upon the principle of grouping all the classrooms round the central porch, so as to give every classroom a side-light to the desks. They are built of red bricks and terra-cotta, with Broseley tiles on the roofs. All the floors are laid with solid oak blocks, excepting the porches, which are of asphalte. The school is for boys only. Mr. W. Willetts, contractor, of Old Hill, is the builder, and Mr. J. T. Meridith, of Kidderminster, the architect.

CHURCH BUILDING AND RESTORATION.

Doncaster.—The church at Marr, near Doncaster, has been reopened after being closed for some months for restoration. The work has been carried out under the direction of Mr. C. H. Fowler, architect, of Durham, and the cost (about 800*l.*) has been defrayed by Mr. P. Thelluson, of Brodsworth Hall. Among the works a new open-timbered roof has been placed over the nave, and a waggon-head timbered roof over the chancel.

Edinburgh.—The foundation-stone in connection with extensive alterations to St. Mary's Roman Catholic Cathedral has just been laid. The side chapel recently destroyed by fire, together with the vestry behind it, are to be formed into a commodious aisle and new vestry, and a corresponding aisle will be constructed on the other or northern side of the nave. The present side walls of the main building are being removed, and their places taken by massive Gothic pillars, with Gothic arches intervening for the support of the roof. The work in all will cost 9,000*l.* The plans have been prepared by Mr. John Biggar, architect, 8 Dryden Street.

Heswall.—The new Wesleyan centenary chapel at Heswall, Cheshire, has just been formally opened. The building provides accommodation for over 325 adults, and consists of nave, transepts and chancel, with minister's vestry and other conveniences at the rear. The style adopted is Perpendicular Gothic, and the buildings are faced externally with local red sandstone, rock-faced in narrow courses, the windows and dressings having tooled faces. The heads of all windows are filled with handsome tracery, and the glazing throughout is of tinted cathedral lead-lights of artistic design. An octagon bell-turret has been designed at the right of main gable, from which it is corbelled out and carried upon red granite shafts. The internal woodwork is of pitch pine varnished, the external work being of red pine, painted four coats. The roofs are slated with the best slates, in alternate red and blue bonds. The total cost of the buildings, exclusive of seating, which has been transferred from the old chapel, is within 1,400*l.*, including heating and water supply. The contract has been successfully carried out by Mr. John Shaw, from the designs and under the superintendence of Mr. Thomas W. Cubbon, architect, of Birkenhead.

Smethwick.—St. Paul's Church, West Smethwick, has been reopened after alterations and repairs. The repairs and extensions have been carried out by Messrs. J. Harley & Sons, Smethwick, from designs by Mr. T. H. Fleming, diocesan architect. A new organ for the church is also being built. The total cost of the improvements is about 1,326*l.*

GENERAL.

Lord Jersey presided at the inaugural meeting of the Incorporated Institute of Surveyors of New South Wales.

Mr. W. Richmond, A.R.A., is designing cartoons for mosaics for the decoration of the choir of St. Paul's Cathedral.

The Order *Pour le Mérite* has been conferred on Professor Hildebrand, the sculptor, of Florence.

A New Oak Lectern for St. Paul's Church, Devonport, has been executed by Messrs. Rashleigh, Pinwill & Co., of Plymouth, from the design of Mr. Edmund Sedding.

A Reredos designed by Mr. J. L. Pearson, R.A., has been placed in the church of St. Mary, Aylesbury.

An Appeal is being made for funds for the restoration of the ancient church of St. Lawrence, West Challow.

The Mansion of Mr. Robert Barclay, principal partner in the well-known brewery firm, at Bury Hill, Dorking, has been seriously damaged by fire. The damage is estimated at about 1,000*l.*

Earl Brownlow has given a plot for a new church at Kitsbury, a rising suburb at the west end of Great Berkhamstead.

The Electricity for the forthcoming Electrical Exhibition at Frankfort is to be generated by the river Neckar from a point 70 miles away.

The Salford Town Council on Wednesday adopted plans prepared by Mr. Henry Lord for the erection of a technical school, near Peel Park, the cost of which, including the fittings, is roughly estimated at 40,000*l.*

Professor Pistor, of Berlin, who has been attending the Hygienic Congress, has visited Manchester with a view to making inquiries respecting the sanitary arrangements of the city.

The Works for placing the fifth of the series of mosaics for the spandrels of the dome of St. Paul's Cathedral are now in progress.

The Bury Markets Competition has resulted as follows:—1st premium, Mr. Archibald Neill, of Leeds; 2nd premium, Messrs. Lewis Hornblower & Sons, of Liverpool; 3rd premium, Mr. H. B. Buckley, of Leeds. The designs of Mr. Robert F. Matthews, of Birmingham, were also commended.

Mr. B. Wall, of Newport, was awarded a gold medal and first prize for wood-carving in oak at the Welsh Eisteddfod, and a cheque for ten guineas and a silver medal for the best carved oak Bardic chair were secured by Mr. W. T. Morgan (Swansea). The prize for hammered ornamental ironwork was withheld.

In an Action to interdict the Bellsdyke Coal Company from working minerals under and around the Airdrie Academy so as to endanger the stability of the structure, the interim interdict has been continued till September 8 to admit of defences being lodged by the defendants.

At the Meeting of the Wetheral Burial Board a letter was read from Mr. Johnson, the Board's surveyor, offering his services as architect and surveyor in the carrying out of the cemetery at Ashgate, preparing all plans, sections, specifications, levelling, &c., for 49*l.* 16*s.* 4*d.*, the advertising for all tenders for the work to be done by the Board. The offer was accepted.

The Contract was obtained in May last by Mr. James O'Driscoll, of Glin, co. Limerick, from the Nenagh Guardians, for the carrying out of waterworks for the town, at a cost of between 5,000*l.* and 6,000*l.* Having since found out that in the diversion of the river which is to form the source of the water supply that he has estimated 666 yards as 666 feet—a mistake by which he would lose 700*l.*—he has declined to perfect the bonds. The Guardians find they cannot keep the contractor to his contract, as he has not his sureties, though otherwise the bond has been perfected. Fresh tenders are to be advertised for.

The Architect.

THE WEEK.

On Wednesday there was a meeting of the General Committee of the British Association, when Professor Huggins announced that the tickets which had been taken for the Cardiff meeting numbered 1,488. A resolution was reported from the Geographical Section in favour of the immediate publication of the 1-inch and 6-inch Ordnance Survey maps, also of bringing the maps up to date and making them more accessible to the public and supplying them at lower prices. A letter was read from Sir Archibald Geikie, acknowledging the honour which the Association had conferred upon him by electing him as its president for the Edinburgh meeting, which is to be held in August next. The meeting of 1893 will be at Nottingham. Money grants amounting to a total of 1,013*l.* 15*s.* 6*d.* were then made to the various committees of different sections for carrying on the scientific investigations entrusted to them.

The autumn exhibition of the Birmingham Royal Society of Artists will be opened on Friday next. Among the works which will be seen are the *Bath of Psyche*, by Sir F. Leighton, P.R.A.; Mr. Orchardson's portrait of himself; the portrait of Mrs. Chamberlain, by Sir J. E. Millais; *Love and Life*, by Mr. Watts; *Sposa de Libano*, by Mr. Burne-Jones; portraits of Dr. Hans Richter and M. Paderewski, by Mr. Alma-Tadema; *The Hills of Morwen*, by Mr. Colin Hunter; *Anne Ascough Preaching*, by Professor W. Geets; Mr. C. R. Kennedy's *Perseus and Andromeda*. There will be an excellent collection of water-colours, and it may be said that many of the best pictures seen in London exhibitions during the summer have found their way to Birmingham.

At the meeting of the Edinburgh Town Council on Tuesday it was decided that inscriptions should be placed on any public monuments where they were needed to explain the subjects. Edinburgh has so many visitors it is desirable to have information of the kind. One of the councillors at the same meeting called attention to misleading inscriptions which were set up in the city. There is a notable case in St. Leonard's Lane, where a tenement has been erected on which an inscription has been carved on stone for all time to come, announcing that it was the site of Jeanie Deans's tryst. Readers of the "Heart of Midlothian" are aware that the place of tryst was at Mushets Cairn. A Town Council cannot do much to prevent such records. They are not unknown in London, where simple visitors are affected by them.

The competitors for the Prix de Rome have a chance of other prizes besides the coveted one. The three successful students have an equal share in the Prix Leprince, amounting to 2,425 frs., which this year has been divided among M. Levalley (painting), M. Sicard (sculpture), and M. Eustache (architecture). The last also obtained the Prix Delannoy, amounting to 1,000 frs. The Prix Cambacères, of 2,000 frs., has been divided between M. Déchenaud, painter, and M. Lefebvre, sculptor, who obtained second places in the contest. M. Normand, who was assigned the second grand prix in architecture, is more fortunate, as there are two consolation prizes available in his section, viz. the Prix Pigny, of 2,000 frs., and the Prix Lusson, of 500 frs.

Among the papers read at the meeting of the British Association this week was one by Mr. E. Seward, architect, on "The Formation of a Record of Prehistoric Remains in Glamorganshire." He said that district contained many of the earliest evidences of the handiwork of man. They had ceased to wonder at towns and villages springing up on bare heaths and mountain sides, and a record of the old order of things might prove of interest. The usefulness of such a record must be acknowledged. Looking inland a little from the rocky cliffs of the coast, on the ridges and table-lands which now had busy works beneath them, they saw rounded tumuli and traces of camps and menhirs and circles, which told them of man and his doings ages beyond the time when they were even sure of the name by which he was to be known. Elsewhere the pit hollowed into the shelving hillside, the blackened timber still to be traced beneath the quiet waters of the lakes, the monolith, the cromlech, the stone circle, each had its page for the book of a yet scarce-written history. Then a clearer type filled the pages. The Romans came, built encampments, made roads, and raised places of residence. Here they were on the borderland of history, but of the many years which followed the decay of the Romans there was little left but legend and story. They must, however, look for more material evidences in connection with those days than mere legends. They did not look in vain, for evidences of a Christian symbolism were found in the crosses, altar stones, tombs and monoliths, inscriptions and interlacing ornaments. They were, doubtless, remnants of a great array which proceeded from those centuries of early Christianity in Glamorganshire. Most of the known remains had been photographed and the work of forming a systematic record had been begun, the work having been suggested at a meeting of the Cardiff Naturalists' Society in 1885. Mr. Seward concluded his paper by referring to the various ways in which the record could be kept up and extended, and expressed the belief that it would be of great interest when completed. The President and several other members spoke in complimentary terms of the paper, and various suggestions were made for marking on maps the positions of caves, camps, tumuli, dolmens, barrows, &c.

Until a few weeks ago the Eleanor Cross at Waltham Cross stood near the corner of the street that branches out at right angles in the direction of the Waltham Abbey Road from the main street. The Cross now has a central position in the street, the Falcon Hotel having been taken down and set back in order to double the width of the street. This work is due to the generosity of Sir Henry Meux, Bart., who also, it will be remembered, did a good work in rescuing the masonry of Temple Bar from the Farringdon waste. This structure was re-erected in Theobald's Park, and is distant about a mile or two from the Cross. People who have been accustomed to see Temple Bar hemmed in amid Fleet Street can hardly realise the grandiose appearance it presents as seen in its present country home, with fine trees as a contrast. About four miles from the town of Waltham Cross is that of Waltham Abbey. The portion of the abbey still remaining was restored by the late William Burges, who was reverential in his treatment of the ancient work.

The Plasterers' Company have offered 25*l.* for prizes, which will be awarded after an examination which is to be undertaken by the City and Guilds of London Institute in May 1892. The subjects of the examination will relate to limes, sand, hair, stucco, plaster of Paris, lathing, cements, tools, plastering, sgraffito, modelling, &c. Each candidate for the honours grade will have to submit a specimen of his work in sgraffito, modelled stucco or piece moulding. It is well to see the Plasterers' Company showing a little interest in the education of workmen, but something else besides a donation of 25*l.* should be offered. Why is not the old system revived, and the freedom of the company offered to plasterers who are able to show that they are worthy to become members of a trade guild?

M. Ringel d'Ilzbach has gained celebrity in Paris by his portrait-medallions, but he has proved his competence to treat sculpture of another kind. The Duchess de Pomar was therefore well advised to select him to produce a statue of Mary Queen of Scots, which was to be presented to the city of Paris. It was shown this year in the exhibition in the Champ de Mars. The Duchess was eager to have the work set up in the Place Wagram, but owing to the traffic municipal authorities considered that site to be unsuitable. It is now said that the statue will be offered to Edinburgh. According to another version, the Duchess was desirous that the statue should bear some resemblance to herself, and the difficulty thus arose. In any case, it is to be hoped M. Ringel d'Ilzbach will not suffer loss. A statue of the kind is more costly than the majority of amateurs can realise.

ENGLISH RENAISSANCE.*

THE second instalment of the splendid work on the English buildings of the Renaissance period is equal in quality and interest to the first. There is, moreover, an additional quantity of descriptive letterpress and diagrams, and the costly plates have been increased to twenty-two. Subscribers will, therefore, obtain more than was agreed for, and so much liberality suggests the spirit which has inspired the arrangements for the work. It may be said without any exaggeration that no German or French publisher could produce a more satisfactory volume or more faithful representations of the buildings, and, remembering the indifference of the profession in England to all but the cheapest class of books, the appearance of such a work is a marvel. Foreign publishers can always rely on a liberal recognition of their enterprise by architects; there are publishers in Paris and Berlin who will rarely bring out a book on an architectural subject unless the price is to be equal at least to twenty shillings of English money, and it is common to find works for which the price is from five to ten pounds. However costly the books may be there is a market for them. Architects invest in them not merely for the use that can be made of the plates as patterns, but for the delight which is afforded by the subjects. Being proud of their profession they are willing to make sacrifices to possess volumes which are a tribute to its greatness. We should not be surprised to hear that Mr. Gotch's book was more sought after in Germany than in England. But the German architect moves in the midst of people that are cultured, and it would be dangerous for him if he could not at any time be able to explain the ramifications of the Renaissance. The knowledge which he is expected to possess is not to be obtained in shilling volumes that he is able to borrow whenever he finds it necessary to persuade people that he is well read. In France there is no less liberality in expending money on professional books, but they must always bear the name of a Paris firm on the title-page. The English publisher may also fortunately depend on American support. At all events, we trust the "Architecture of the Renaissance in England" will gain the success it merits, and if many countries unite for that purpose so much the better. The subjects can have interest for others besides Englishmen.

If the general forms and details were copied from Italian or other work in the sixteenth and seventeenth centuries with the fidelity that is common in our time, the Renaissance buildings which are shown in the plates might be better, but the work would lose much of its character. The men who produced the details were like translators—it may be "traditori traduttori"—but their interpretations reveal much of their character, and correspond with similar efforts in other ways. In much of the architectural work of the period it is impossible not to be struck with the difference which is to be found between the design, as we can imagine it, and its realisation. From what we see we can infer what was intended. Take, for instance, the "Drawing-room, Bradfield," of which a plate is given by Mr. Gotch. There are several columns of novel forms, but it is evident the carvers were not equal to the delicate ornament. Over them are sunk panels, with sculpture in relief, divided by miniature columns which serve to support canopies for figures, and above is a sort of arcade with figures under the arches. But the figures, however important may be the subjects, are not much better than grotesques. The arches recall Saxon rather than Italian treatment. We must conclude that the Devonshire carvers were not able to realise all the beauty of the design supplied to them. As it is the effect of the room is said to be very fine, but if the work had been executed more worthily the room would be still more attractive. Mr. Gotch describes some of the ornament in the districts about Bradfield, which is ingenious enough; but we cannot believe that the designer of the drawing-room was a man who was only a combiner of scraps.

The Town Hall at Exeter has suffered much from time and the indifference of the lymphatic citizens. The designer was no copyist. If it can be granted that a few columns were adequate to the support of the superstructure, the treatment is logical enough. The columns cannot be called Tuscan; the plain sturdy shafts rest on massive bases, and each has a broad capital, from which the arch springs without the intervention of an architrave. The square windows of the council-room are separated by coupled Corinthian columns, and the pedestals are corbelled down to the caps below—in fact, the designer seemed to be as eager to suggest that all the forms were bound together in a scientific way as to obtain projections to give shadows. When undefaced the small building must have pleased the eye of many a stranger.

The house in the Butter Market, Dartmouth, is a well-known example of timberwork. In this case also the details are not equal to the importance of the design, and the corbels look as if they were produced by a carver of ships' figure-heads. The door from a dining-room in a "House in the South-west of England" bears some resemblance to the style of the Bradfield room, but the gracefulness of the curves reveals that the carving was not by the same hands. It is so beautiful an example as to raise doubts about some of the surmounting figures, which look like later additions that were removed for the purpose from a monument.

According to Mr. Gotch, "no house is more thoroughly English than Montacute," of which he gives three exterior views with a sheet of details. For effect it depends on the architectural lines. There are some helmeted figures between the windows in the upper storey which look more uncomfortable than those of Heidelberg, and a coat-of-arms, but no other carver's work. It is also true that "there is hardly any moulded work beyond that on the balustrade, the cornices and the windows," and if that work has a fault it is in an excess of delicacy. The designer may have been timid or did not make adequate allowance for the largeness of the building. When used for the small garden-house the moulded work appears far more effective. The detached columns at the angles appear to be of use as well as ornamental. The columnar form of the chimneys is also a defect which is not confined to the roofs of Montacute. The interior contains a gallery of about 170 feet in length by 20 feet 6 inches, but many changes have been made in the arrangement of the rooms since 1601.

Lower Walterstone, in Dorsetshire, which dates from 1586, was much damaged by fire in 1864, but the parts which Mr. Gotch has had photographed are those which suffered the least. The house might easily be supposed to be erected in the same way as early Christian churches; that is to say, by the despoiling of other structures. Mr. Gotch says "the detail is refined, and in places piquant, but the whole composition is a curious medley, some of the columns being quite out of proportion to the others, and the whole of them applied in the most barefaced way, merely as ornaments, while cornices and friezes are remorselessly cut through, and left to find support as best they can." The house is one of those buildings which could be taken as evidence of the theory that the forms commonly considered as essentially architectural are extraneous to the construction, and might be removed without much loss. In the garden front the whole of the columns, cornices and arches appear to have been stuck on after the true construction was completed. A doorway, no doubt, has been filled up, and therefore so much expense on ornamental work appears waste; but even with an open entrance the assemblage of Classic forms could only have suggested ostentatious display. Parts of the house are satisfactory, and we might suppose that the works began well, but the architect who devised them could have had no part in their completion.

Longford Castle, in Wiltshire, which is shown on one plate, was among the experimental attempts of the Renaissance builders, as it is on a triangular plan, the angles being emphasised by round towers. There is an elevation of the building by John Thorpe, but the triangular plan he gives does not correspond. The house has had many owners, and it "has been so materially altered from its original state as to have undergone practically a rebuilding, in which process, however, the old materials were reused." The triangular arrangement has survived, and two of the three towers are original. The inner court has been roofed, and converted into a saloon. The entrance front is admirably treated, the only drawback being the four-centred arches of the lower arcade. In Thorpe's drawing the arches are round, with masks in the spandrels.

* *Architecture of the Renaissance in England.* By J. Alfred Gotch, assisted by W. Talbot Brown. Part II. London: B. T. Batsford.

Burford Priory is now in ruin, although seventy years ago it was occupied. There is a chapel as well as a house, and much of the work was erected about the middle of the seventeenth century, at the cost of Speaker Lenthal. The peculiarities of the place are thus described by Mr. Gotch :—

> The work generally exhibits a curious survival of Jacobean influence. The windows of the house are Jacobean with a difference, the short lights at the top being particularly effective. The porch, with its columns, its pinnacles and carved gable, is Jacobean too, but the figures supporting the upper columns and the termination of the gable are indications of a later date. The chimneypiece in the drawing-room also retains much early feeling, though the change to the later style is apparent, while the ceiling in the same room might have been worked in the first years of the century. It will be observed that the moulded strings, &c., are of an unusual section, while the windows of the chapel exhibit a remarkable combination of quasi-Gothic tracery, with fully-developed Classic architrave and cornice. The wheel window might at first sight be taken to be Gothic, but a close examination shows it to be part and parcel of its Classic surroundings. The east and west windows are genuine attempts to give to traceried windows a Classic appearance, or at any rate an appearance other than Gothic. It will be noticed that some care has been taken to divide the head of the east window into five, the wheel window into ten, and all the rosettes that adorn them into five.

The monument of Sir Laurence Tanfelde in Burford Church is a curious medley of Classic forms, and it is impossible to understand the perversity by which heads were stuck against Corinthian capitals to form corbels and the allegorical figures were placed on an odd sort of pots. Another curious tomb shown in the second part is the "Griffin Monument" in Braybrook Church. This is one of the works which seem to have been executed by clumsy fingers from a good design, with additions that were out of keeping with the original intention. The architectural part might be supposed to have been arranged to suit unskilled workmen, but there could be little compromise with the heraldic forms, and in consequence they are ridiculous. With all the defects the tomb must have impressed people with the greatness of the member of the Griffin family to whose memory it was erected; it has, however, failed to preserve even his name.

At a time when heraldry was supposed to impart a sort of greatness to an individual or a family, it is remarkable to find one owner who failed to utilise the shields which his builder provided for him. When Sir Thomas Pope erected the house known as Wroxton Abbey in Oxfordshire, no less than eight shields were introduced as part of the decoration of the entrance porch, but the fields are still empty. The porch is interesting, and the oak doorway is so elaborate as to seem like an importation from Germany or Holland.

If at Burford seventeenth-century builders utilised Jacobean as if it were the style of the time, at Bolsover vaulting is to be found which, although of the seventeenth century, would be worthy of a Mediæval builder. As presented by Mr. Gotch's plates, Bolsover Castle appears to be full of detail that surprises by its freshness, and the execution is not unworthy of the design. The chimneypieces are, for "number, variety and beauty, without parallel in any house of the period. They were clearly designed for their respective positions. Much care has been bestowed upon their arrangement, and they are generally set within a projecting framework of stone, against which the wooden panelling stops instead of cutting into the various projecting members." We hope Mr. Gotch will be able to give some more views of the interior, for the Bolsover plates seem to be exceptionally interesting, as the designer exercised his invention instead of copying. He mastered the principles of the style, and his innovations are generally to be commended. In no other of the views is there so clear a recognition of the purposes which straight and curved lines can serve, and how the appearance of firmness is secured by the former. Even in the volutes of the capitals there is some rigidity. According to a historian of the building the architect was Huntingdon Smith, who lived at Bolsover in 1601, but Mr. Gotch doubts "whether the same architect did actually design the various buildings at Bolsover Castle."

Barlborough Hall, Derbyshire, dates from 1583–84, and Mr. Gotch believes that as the plan is of the same type as Bolsover it may have influenced the disposition of that structure. Many changes have had to be made in the house, but the exterior is a characteristic example of a dignified but quiet English mansion.

From what we have said it will, we trust, be evident that Mr. Gotch has selected a series that is interesting, and that each part is varied. His work will be valuable for architects and for amateurs who have regard for truthfulness; it will be found far more interesting than Nash's work.

THE SOCIETY OF ARCHITECTS' EXCURSION TO BELGIUM.

(*Continued from page* 108.)

EACH Belgian town appears to have a characteristic of its own. At Bruges was found cut brickwork and at Ghent rich Flamboyant tracery, but at Antwerp on Wednesday was found much greater delicacy of detail than in either of the other towns, and this not in one style or at one period only, but in Gothic, Renaissance and Modern work alike. In the modern Bourse it was first seen, by those who visited it in the early morning, in the carving and in the tracery which adorns the double row of columns supporting the gallery and those carrying the light iron roof above. Equally it was evident in the Hôtel de Ville, where in room after room most graceful and delicate Renaissance carving was to be seen, both old and new, it being often difficult to distinguish one from the other, the spirit of the older work had been so well caught by the modern workman. The low screen in the council-chamber certainly has a crisp character of its own, for it is finish and not crispness which is mostly found at Antwerp, as in the cut-brass panels to the doors in the conscript-room, the newly-added frieze to the dado in the mayor's parlour and reception-room, and the other modern dados, to say nothing of the modern paintings by Baron Leys and the still more recent ones by Lagye in the marriage-room. In the Musée Plantin, again, it is found in evidence in a curious pump of iron, and in the carved woodwork of cabinets and dados, and of a quaint external staircase, all much resembling the early Renaissance work of our own country. Yet again, and prominently, it is visible in the cathedral, over which the members were conducted by M. François Baeckelmans, now engaged as architect in its restoration, for the refinement of the lantern-spire is well known; but nothing in the church can equal the new carved reredos to one of the chapels in this respect, in which oak is treated with a delicacy of which even the most experienced of the party scarcely thought it to be capable, while still with truth and firmness. Probably this will be the prominent characteristic of the new organ-loft, but unfortunate indeed is its position, blocking up the handsome western window, and its iron construction, entirely out of harmony with the surroundings, and to be cased, on account of its unsightliness, in panelled oak—an indifferent substitute for the solid stone construction which would seem naturally to suggest itself. After leaving the cathedral the members scattered, some visiting the older parts of the town and sketching quaint bits, while others wandered into the various picture galleries, spending the few remaining hours there.

As each of the towns previously visited has its characteristic, so has Mechlin or Malines, reached on Thursday, for here towers and tourelles stand pre-eminent, with the great tower of the cathedral as their undisputed chief. Bold and massive, well designed, it rises from the square, and takes away the thoughts from the beautiful surroundings which lead up to it and add to the effect—the chevet, the old houses around, the museum with its one tourelle, and the Halle aux Draps with two. Canon Von Caster received the members at the cathedral and acted as their guide all day, pointing out many a curious detail which would else have escaped their observation, and leading them not only over this, the chief edifice, but everywhere throughout the town where there was anything to see—into his own private house, to view his grandfather's design for the completion of the cathedral tower; to the bridge whence the Convent des Carolites, with its tourelle, could be inspected; to the Palais de Busleyden, with another similar tourelle; and then in rapid succession to the restored palace of Margaret of Austria, to the Place and museum again to see many an old house, some in timber, some in stone, including the

Salen Inn, the earliest Renaissance work in Belgium, to the old town gate, with yet two more tourelles, and to the church of Notre Dame to see RUBENS's picture of *The Draught of Fishes*, a work well known to everyone, though engravings can give no idea of the rich colouring and masterful composition of the original.

If Brussels, to which town Saturday was devoted, has an architectural characteristic, it is that of stucco, for it is essentially a modern town, and the modern work, save in rare instances, is not of a high order. The Hôtel de Ville, which everybody knows, and in which the members were received by four of the chief officials of the city, contains some little good old work, and much of excellence, the work of the city architect, M. JAMAR; but the King's Palace, to which access was accorded by His Majesty's express commands, grand as it is both in proportion and design, is largely stucco. It is the furniture there which is of greatest beauty, after the reposeful lines of the staircase, ball-room and banqueting-rooms have made their presence felt in leaving the mind leisure to attend to detail, for the coverings were removed, and many a chair and table of delightful harmony and richness was disclosed, to say nothing of the wonderful collection of Dresden china, though surely the exceedingly thin porcelain petals of the flowers upon the one leg of a china table would never withstand a day of actual use, though eminently beautiful. Stucco again was the prominent feature of the new Palace at Laeken, now in course of erection to replace that burnt down some few years ago; for the King's commands had allowed of a visit to the works. It was a real treat, too, to wander through the great conservatories, and one idea, at least, of value was taken away, in the artistic treatment of their wrought ironwork.

Mons, visited on Monday by the reduced party of twenty-three which continued the tour for the second week, has its characteristic, and that characteristic is its meanness. Certainly the general opinion was that, save for the cathedral and, perhaps, the bold fifteenth-century façade of the Hôtel de Ville, the town was not worth a visit. Yet few would have cared to have missed the former, built, as it is, entirely in one style—Flamboyant—of which it is an excellent example. The exterior, for want of its tower, which has scarcely been commenced, is not particularly striking, save for its harmony and the easy grace of the window tracery; but the internal effect is imposing by its loftiness the grand massing of the parts, and the play of light and shadow. The treatment is bold and yet helped by the many chapels, which occur not only round the apse but along the whole length of both aisles. The roof is vaulted in brick, and there are no caps to the piers, so that the vault ribs are carried right down to the pier bases. Some beautiful alabaster sculpture is to be seen in panels scattered about the church, all of which at one time belonged to the sixteenth-century Renaissance choir-screen, removed some eighty years ago, while a small thirteenth-century reliquary is exquisitely wrought in gold filigree and inlaid silver, and an illuminated Book of Hours is remarkable for its finish and its wonderful state of preservation.

Tournai, though it possesses several buildings of interest, has one crowning feature of such a majestic character as almost entirely to draw attention from the rest—the cathedral, over which Canon HUGUET, in the absence of the Bishop, officiated as guide, and a capital guide he proved. He first showed the members the valuable collection of reliquaries, vestments and illuminated MSS. belonging to the cathedral, many of great beauty and interest, and then conducted them over the noble building. The nave, he explained, was begun in 1070, and is a perfect example of the work of the period, with richly-carved capitals, such as we should find in our later Norman, beautifully sharp, being wrought in the hard greystone found in almost all the Belgian churches, but particularly here, close to the quarries. Then the Transitional transepts with their apsidal ends are most exceptional and beautiful features, in keeping both with nave and the elegant, simple and lofty choir of the thirteenth century—which, by the way, showed signs of failure fifty years after erection, and was strengthened by thickening the main piers upon the aisle side, this being most cleverly accomplished, and the vaulting being remodelled in consequence. The retro-choir, with its projecting bays between the buttresses, is of this period, and French in feeling. The church of St. Jacques is noticeable not only for the beauty of its thirteenth-century interior, but from the triforium gallery being external to the clerestory windows; and the church of the Magdalene is of simple character of the same date, its feature being the carrying of the hood-mould to the three-light window in the square east end right across interiorly. The ancient town bridge across the river, with its existing portcullis grooves to block it against invaders, is curious, and the belfry and a house in the Rue de Paris are worth sketching.

GOVERNMENT OFFICES IN LONDON.*

THE whole business of the Government offices has been a kind of *decrescendo* from the great idea propounded by Barry. The Government did at one time so far entertain the idea of the Great George Street site for Government offices that they purchased some property in the street as a commencement—just enough to be of no practical use unless the scheme were carried further, as it is needless to say it never has been. In 1856, however, the Government made up their minds to combine the Foreign, Home and Colonial Offices, the India Office and the Local Government Offices on the central portion of the site originally proposed by Barry; and a competition took place for this, in which the designs of Scott were ultimately selected. Here again, however, we had an instance of the same ill-judged State interference in regard to style as in the case of the Houses of Parliament. No style was in the first instance imposed on the competitors, as in that case; but Scott having sent in a design in a somewhat Italian variety of Gothic, Lord Palmerston, who chose to constitute himself arbiter of taste for the nation (a self-assumed position for which he had about as little qualification as could be), obstinately refused to have anything to say to a Gothic design, and left the architect with the alternative of abandoning his most cherished convictions or relinquishing his commission. Some of Scott's best friends thought, not unreasonably, that he would have taken a higher position if he had stood to his colours and refused to sacrifice the artistic convictions which he had professed during his whole lifetime, especially as he had already made an almost unexampled success in his professional career. Whether, however, he would really have produced a building very superior to the existing one if he had been allowed to carry out his Gothic design may be questioned. His real power consisted in his mastery of ecclesiastical Gothic, and he did not possess, beyond this particular line of work, by which he made most of his reputation, a very high architectural faculty; he was seldom thoroughly successful when he quitted his peculiar walk, and his great façade to the St. Pancras Station shows that, even when left with a free hand as regards style, he did not succeed in producing a secular or business building which could command permanent admiration. At the time the St. Pancras Station was built it was thought so spirited and so splendid an innovation to build a Gothic railway station that great enthusiasm was excited in regard to the work; but now that the Gothic fever has died out it does not find many admirers, and it would very possibly have been the same with the Government offices had they been carried out according to the original Gothic design. There would probably, however, have been better detail than we find in the building as it now exists, in which the architect was working with materials with which he had no sympathy. Taken all round, the Government offices can be called no more than a respectable building; it has no originality, no breadth of treatment, and excites no interest. The best portion of it is the internal façade of the courtyard. The front towards Whitehall, it must in justice be remembered, is not carried out altogether as designed, as the angle pavilions were intended to have been carried up higher with some kind of cupola or other finish, which was cut off, from the spirit of economy which so often leads to the spoiling of our public buildings; and there is no doubt that with this accentuation of the angles the general effect of the front would be very much improved, though it could not atone for the generally commonplace character of the details. We may note one fact in connection with it which Mr. Wheatley does not mention, viz. that in regard to the westward portion of the buildings Scott was by official direction associated with Sir Digby Wyatt as joint architect, but we have no data for apportioning the precise part which each took in the work.

The new Law Courts was the next great official work. After two or three alterations of programme, twelve architects were, in 1866, invited to compete—Messrs. Abraham, E. M. Barry (the son of Sir Charles Barry), R. Brandon, Burges, T. N. Deane, Garling, Gibson, Lockwood, Seddon, Scott, Street and Waterhouse. The first in the list, an architect little known to fame, owed his invitation to some official influence. The others

* From the *Edinburgh Review*.

were selected for their reputation. The designs, which were sent in and exhibited in 1867, excited great interest, and unquestionably, in their variety and picturesque character, spoke highly for the architectural genius of England, though an eminent judge is said to have remarked, on visiting the exhibition, "I see a great many fine towers; but where are the courts?" Among them Burges's design was remarkable for its powerful treatment of a French type of Gothic; Mr. Garling's for great breadth and dignity; Scott's design displayed the same characteristics in a very different form; Barry's showed a novelty in a dome with Classic outline but Gothic detail; Mr. Seddon's was remarkable for a wild picturesqueness and for a colossal record tower, which was by no means so abnormal a conception as the public seem to have thought; Street's design also was characterised by picturesqueness and variety, with admirable treatment of Gothic detail. Gothic was all in power now, and few thought of protesting against it. Eventually the jury, among whom there was not a single artist or architect (again according to the usual absurdity of English practice in such matters), ruled that E. M. Barry's was the best plan (a verdict which was hardly questioned), and that Street's was the best design, and that, accordingly, Barry and Street should be appointed joint architects. As it had been before settled that plan was to count before design, there can be no doubt that E. M. Barry practically won the competition, and had a right to the appointment; and everyone who knew Street's character, his force of individual will, and his intolerance of any style of architecture except revived thirteenth-century Gothic, must have known that such a combination was practically impossible; and, indeed, the very idea of appointing one architect for the plan and the other for the design of a building was preposterous in itself. Street soon succeeded in pushing Barry out, and the latter was promised a great new design for the National Gallery, of which he was afterwards deprived, and put off with the task of merely carrying out the new rooms at the back of the Gallery—a double disappointment which, there is no doubt, shortened his life. It cannot be pretended that E. M. Barry inherited the genius of his father; practical knowledge and ability in planning were his strong points, and his Law Courts design evinced these qualities rather than architectural genius; but it would probably have been very much better for public convenience if he had received the commission which, according to the terms of the competition, he had justly earned.

Street's front to the Strand was designed on the principle (quite justifiable in itself) that it was of no use to attempt a grand façade of one homogeneous design on a site facing a comparatively narrow roadway, where it could never be properly seen as a whole; and it was, therefore, purposely broken up into a varied architectural scenery with no predominating design. Of the building generally, it is a difficult and rather a melancholy task to speak. It is at all events not commonplace, and the whole of the detail shows the hand of a master of Gothic architecture, more especially in the mouldings, which have the fulness and largeness of style characteristic of the Mediæval spirit, and every detail in the building was designed by his own hand. The design for the great hall was the object of a very uncalled-for attack by Fergusson, who, with all his breadth of insight into the conditions of architecture generally, was often singularly captious, unfair and irritable in his criticisms on special buildings, and who wrote letters in the *Times* against Street's hall on the mere ground that a narrow vaulted hall, like the nave of a cathedral, had never been used for such a purpose, and that it ought to have been a wide timber-roofed space like Westminster Hall. There seems no possible reason why what had never been done before should not be done now, and the *salle des pas perdus* of the Law Courts is a fine hall, and none the worse for being vaulted. But the building generally is sadly deficient, externally, in architectural dignity and refinement. The tower, if it can be called a tower, is probably the very ugliest erection of its kind that has ever been attached to an important building. The charge of inconvenience and bad acoustic properties, made against the courts themselves, has been a good deal exaggerated, especially by learned judges, who are, as a class, peculiarly hard to satisfy in these matters. But as to the general plan, with its rabbit-warren arrangement, its narrow and inconvenient staircases and tortuous passages, its dark corners and corridors where the light of day never penetrates, it is to be feared the building deserves all the unkind things that have been said about it. It is the work of an architect who had no genius for plan, and no breadth of architectural conception. Street's talent lay in giving beauty and dignity to parish churches, in which he has been surpassed by no architect of his generation. A multitudinous building like the Law Courts was beyond his powers, and he has left a legacy of inconvenience to generations of lawyers and clients, and all who are obliged to haunt what in this case are too truly "the dusky purlieus of the law," encased in a building which may be said to be, architecturally, the grave of modern Gothic.

The next attempt at a great Government building was an entire fiasco. In 1882 was published the new scheme of the Government for a site for the War and Admiralty Offices. Architecturally it was one of the worst-devised plans that could be. The competition for the proposed building took place in 1884, but it was a sad descent from the Law Courts competition. In that at least architects of genius took part, and produced a series of remarkable designs. The Admiralty and War Offices competition was a double one, a sketch competition open to all comers first, from which six were to be selected to compete again. But the terms of the competition were so drawn up that few architects of the first rank troubled themselves with the matter. A design was eventually selected. But even this was not to be carried out. The cry of "economy" was raised, and the whole was reduced to a patching up of the existing Admiralty building (a poor affair of Ripley's, the architect immortalised by Pope's cutting and certainly in this instance just satire), and the erection of an additional block of uninteresting building, now in progress, in the most economical manner. This is what we have descended to from Barry's grand plan of 1857. Something more than the loss of a great building is to be deplored; it is the loss of the spirit of artistic ambition in the nation. Public architecture is only an ornament of public life, but it is an ornament which speaks of much behind it. Every noble-minded society, in a state of prosperity, has desired to express its joy and its aspirations in noble buildings; and when there is no longer any care for producing noble architecture—when legislators, elected by popular voice, find that they will best recommend themselves to their constituents by raising the cry of "economy" whenever there is a question of spending money on producing something beautiful, the nation is infallibly going down hill. "In the youth of a state," says Bacon in his pregnant sentence, "arms do flourish; in the middle age of a state, learning; and then both of them together for a time; in the declining age of a state, mechanical arts and merchandise." The little kingdom of Belgium has recently spent an enormous sum in the production of a sumptuous law courts building which is the admiration of Europe. England has neither done nor cared to do any such thing since the erection of the Houses of Parliament.

OLD EDINBURGH.

THE freedom of the city of Edinburgh has been conferred on Sir Daniel Wilson, president of the University of Toronto, the author of "Memorials of Edinburgh," a work which is now being reprinted. In acknowledging the privilege Sir Daniel Wilson spoke of some of his associations with the city. From earliest years, he said, his feelings and sympathies had been intimately identified with all the ancient associations and historical memories of the capital of his native land. The old legends and traditions of its closes and wynds, the historical memories that haunted them were the object of his earliest study and investigations. Still memory fondly reverted to the old features, some of which abided, and some lived only in the past—the old West Bow with its Temple Bar, where predecessors of his lordship in the chair were accustomed to welcome royal brides and greet them with costly largess; Blythe's Close and its palace of Mary of Guise, with the faded beauty and grandeur which belonged to the time of her old regency; the old Trinity College Church—to protect which from destruction he had fought a keen battle—rich with ancient historical records illustrative of the characteristics of the transitional period that marked the reign of James II. and of the Queen to whose piety they owed the splendid memorial of the architecture of the fifteenth century, of which they had preserved still a fragment behind the new church in Jeffrey Street; the quaint Blackfriars' Wynd, with all its associations with the old Dominican Friars, with the good Bishop Kennedy, with the proud Cardinal Beaton, with the Douglases and the Hamiltons, with gentle Gavin Douglas, who in a barbarous age—

> Gave to rude Scotland Virgil's page.

All these were intimately associated in his memory, for the Edinburgh he mostly thought of was an Edinburgh—the Auld Reekie—of fifty or sixty years ago, "the romantic town" of Sir Walter Scott. To him the Edinburgh of that time was associated with a large circle of intimate and loving friends. The majority of them lived but in memory, and it was with peculiar gratification that he had realised on his return, after long absence, that still warm hearts greeted him, and he received the grasp of kindly and loving hands. Words were altogether inadequate to express his sense of gratitude for the honour that day conferred upon him that linked him with new ties to the city of his birth. Edinburgh was to him as Jerusalem was to the old Royal Hebrew; as the city of the Violet Crown was to the Athenian. He could say with all sincerity, "If I forget thee, let my right hand forget its cunning." Edinburgh was in the truest sense of the term the heart, not of Midlothian, but of Scotland. It was intimately bound up with the national history of that little corner of the land which had so many

associations and memories that the world would not willingly let die; for there through centuries the long battle was fought for liberty and independence which secured the treasure of the freedom they now enjoyed. He was familiar with many cities of the old world and the new, many of them with singularly attractive charms, but he knew of none that could compare in its beauty and its associations with their city, with the singular blending of its splendid site and the magnificent views it commanded on every hand of distant landscapes and the engirdling sea. Familiar as he was with the beautiful views obtained from the Calton Hill or the Castle Rock sixty years ago, he grieved now to find a veil of smoke, such as Auld Reekie did not know then, concealing its charms; and he could not help thinking that the Lord Provost might exert himself to compel the consumption of much of that obstructive smoke. But the greatest charm that belonged to Edinburgh lay in its historical associations; and what a story did it tell. The Roman footprints were not altogether yet effaced. The record of their Celtic kings survived. The old Oratory of St. Margaret, the Queen of Malcolm Canmore, happily survived, with the charming associations of that legend of one whose noblest virtue as a saint was that she was a true mother. Through the magnificent liberality of one of the worthiest of their citizens, the life-long friend of himself, the late William Nelson, they had recently received the gift of the restored banquet-hall of the ancient castle buildings, where kings had feasted through long generations and where Scottish Parliaments assembled in deliberation. When the Tay was deserted for the Forth, upon the assassination of the poet king, the Scottish Estates assembled in that very hall to inaugurate the succession of his youthful son. There the boy king, alternating between the castles of Edinburgh and Stirling, passed his remaining youth. At a later stage the young King James IV. spent his early years there, and witnessed from the windows of the banquet-hall the tourneys below. Thence he looked upon the muster of the host of Scotland upon the Burroughmuir that was to go forth to the fatal field of Flodden. After that disastrous event, in the banquet-hall and the surrounding chambers the youthful James V. and his poet tutor, Sir David Lindsay, passed their probationary years. There also Queen Mary gave birth to the boy that was to unite the crowns of England and Scotland, and pave the way for the interblending of the two nations. At a later stage Charles I. celebrated there his coronation banquet, and the interval was brief before Oliver Cromwell was feasted in the same hall by the Lords of the Congregation, under the very roof that legend told of the bloody bull's head being laid before the Douglases as a warning of their last meal. That hall was associated with a succession of chapters of Scottish history, and they could not too gratefully revere the citizen who had restored it. The associations of the Castle—those, for instance, relating to Kirkaldy of Grange—were too many to permit of mention within the limited time at his disposal; and he must not yield to the temptation to linger over the old memories that haunted the slope from the Castle Rock to the valley of the Holy Rood, or pause over St. Giles, the restoration of which they owed to the liberality of another citizen—an occupant of the chair the Lord Provost now adorned. There they had another series of chapters of history full of charms for him. They would pardon him if he said that after visiting Westminster, St. Paul's, St. George's Chapel, Windsor, and other like buildings, and finding the doors open and free to all, it was with a sense of shame he found that there was a charge for admission to St. Giles. He trusted that out of respect to him to whom they owed so splendid a gift as a restored St. Giles, they would throw the door open to the citizens to read the story still recorded there. There was the Preston Aisle, that told of the time when the gift of the bones of St. Giles was regarded as a noble and costly and pious contribution to the city. Alongside was the aisle of Walter Chepman, the friend and confidant of James IV., the Caxton of Scotland, to whom they owed the printing-press, but for which they should have lost the precious literature of Dunbar and Kennedy, and Douglas and others, who constituted that early intellectual era. There, also, they had memories of the first great Scottish scientific men, Napier of Merchiston; of the great and good Regent Murray of Montrose—and he learned that it was proposed to put up a counterpart to the Montrose tomb in a memorial to the martyred Marquis of Argyll—of the Duke of Albany, of the Earl of Douglas and of the reformer Knox. Such a place as St. Giles ought to be free to every child in Edinburgh to study as he would. Assuredly he could not be ranked among those

> Whose heart hath ne'er within him burned
> As home his footsteps he hath turned
> From wandering on a foreign strand.

It was his pleasure and his pride, as of many another Scotsman, to realise in far distant lands, as he had realised on the shores of Ontario, that still with other stars above them they were within the compass of the British Empire, under the same sovereign rule. They could scarcely conceive the feeling with which the old songs of Scotland were listened to by those who had followed in the footsteps of many earlier generations as wanderers on a distant strand. Their hearts still clung to the old mother home, and many a time in their hearts they

> Sigh for Scotia's shores, and gaze across the sea,
> An' canna get a glint o' their ain countrie.

RIEVAULX ABBEY.

AT one of the evening meetings during the visit of the British Archæological Association to York a paper was read by Mr. C. H. Compton on Rievaulx Abbey. He said that the abbey of Rievaulx, or, as it should be more correctly named, Rievall—the valley of the Rie—was the fourth earliest Cistercian foundation in England and the first in Yorkshire. It appeared from manuscripts in the British Museum that Rievaulx Abbey was founded in the year 1131, the three earliest abbeys of this foundation in England being Furness, 1127; Waverley, 1129; and Tintern, 1131. The Cistercian Order was founded thirty-three years previously—in 1098. The abbey of Rievaulx was founded by Walter Espec or L'Espec, a great man in the court of King Henry I. The popular account of the foundation of this abbey was thus given:—"Walter Espec had by Adelina, his wife, a son named Walter, a comely person, who, taking much delight in swift horses, was thereby thrown by one of them, who, being put out beyond his strength, stumbled, and he, falling from him, broke his neck, to the great grief of his parents, who wanted an heir for their great estate. However, taking advice of his uncle, Wm. de Espec, rector of the church of Garton, about the disposal of it, and was advised by him to make Christ his heir, at least to part of it, by building three monasteries, viz. Kirkham in the East Riding of Yorkshire, Rievaulx and Wardon in Bedfordshire." Mr. Compton went into the question of the exact year of the formation of Rievaulx, in reference to which three successive dates are named—1131, 1132 and 1133; and quoted authorities bearing on the point, remarking that if Mr. de Gray Birch's conjecture that the MS. Faustina was compiled from the archives of Citeaux itself was correct, the year 1131 would be the date of the foundation of the abbey. In the original charter, which was without date, Walter Espec granted certain lands, with the consent of Henry, King of England, and the counsel of Adelina, his wife, to God and to the church of St. Mary de Rievalle in the hand of William the Abbot and to the brethren of the abbey. St. Bernard sent over the monks who formed the first capitular body in 1128. They proceeded to form their order, clear the ground and erect suitable buildings, but at first only of a temporary character, so that at the time the charter was granted by Espec—supposed by Mr. J. C. Atkinson to be 1145—the monastery had been constituted; there was an Abbot William and brethren who, having formed a corporate body, could receive the grant which would supersede the informal gift to St. Benedict in 1131, although that was the real foundation of the abbey, and as such was registered in the abbey of Citeaux. This was consistent with the final clause of the charter:—"I, Walter Espec, have founded this abbey, Rievalle, &c., not by that charter, but previously as a reason for a grant contained in the charter." The date of 1132 given by the historian of Melrose might be a mistake, especially as he gave the same day of the month—March 3—as was given in the MS. Faustina, or it might refer to the abbey having got into working order. As to the date 1133, he had not met with anything which could give that date any preference over that of 1131. They might take it then that the year of grace 1131 saw the monks sent over by St. Bernard, with their first Abbot William at their head in possession of the land given to them by Walter Espec. William of Newburgh described the locality in which they settled at that time as a "horrid and vast solitude," and when we looked back upon this wild uncultured waste, and considered how much the sympathy we in these days feel for the beauties of nature arises from the higher culture of the mind and spirit, we might learn to appreciate at its full value the devotion of those old monks as they went forth under the primeval commission to replenish the earth and subdue it, and to develop the industrial activities of the country, and lay the foundations of English enterprise and English commerce, until in the words of the old Hebrew prophet, "The wilderness and the solitary places were glad for them, and the desert rejoiced and blossomed as a rose. The example set by Walter Espec was not long in bearing fruit, and the benefactors to the abbey were numerous, but he could not do more than refer to a few to which attention might be specially directed. A grant made by John de Ever, 1302, releasing all his right and title in the pastures of the forest or officers thereof, upon the account of their lands and tenements in Westerdale, as also of Brockton and Kirby-in-Cleveland, and the homages due to him on that account, contained a condition that if the said lands in part or in whole

should ever come into lay hands, they should return to him or his heirs. It would be interesting to know whether John de Ever's heirs resumed the rights he had thus granted, and it may be worth considering whether some such condition might not be inserted in modern grants to ecclesiastical uses, to counteract the effect of a policy of disendowment. Pope Alexander III., by his bull dated 12 kalend of December A.D. 1160, granted to Aldred, Abbot of St. Mary's at Rievals, his brethren and their successors, a confirmation of all their possessions with divers privileges, and in particular that they might celebrate the divine offices in the time of a general interdict, and Pope Alexander IV., by his bull some time before 1261, confirmed their exemption from tithes, explaining that this exemption extended also to the tithes of any lands which they either manured and ploughed themselves or held in their hands. To such an extent were these bulls granted to the Cistercian monks in England that in the second year of the reign of Henry IV. a statute was passed specially directed against "the religious men of the Order of Citeaux," imposing the penalties of premunire on them and "all other religious and seculars" who should put such bulls in execution. King Edward II., on the return from one of his expeditions into Scotland, and his nobility refreshed themselves at this abbey, and while there news was brought that the Scots came after in great power and with haste. The King and his nobles, minding more their meat than the safety of their subjects or their own honour, neglected the message, but the Scots pursuing eagerly their attempt, came suddenly within sight and compelled to shameful flight the King and his men, which never ceased till they had recovered York for their succour. At the Dissolution the site was granted in exchange for other lands to Thomas, Earl of Rutland, a descendant of Walter Espec, the founder of the abbey, and by Catherine, daughter and heiress of Roger, Earl of Rutland, became the property of her husband, George Villiers, Duke of Buckingham, whose son, the second Duke of Buckingham, sold it to Sir Charles Duncombe, knight. Thomas Duncombe, the grandson of Sir Charles, was the owner of the site in 1758. It now belongs to the Earl of Feversham, the head of the Duncombe family.

The members visited the ruins, which were explained by the Rev. C. Cox, LL.D., F.S.A. He said that the Cistercians resisted all meretricious show, and thus the work was as simple and plain as it well could be. His own church of Barton-le-Street, near Malton, which was one of the same date, showed much finer carving. When the Early English work was commenced, the Norman nave, which had now all but disappeared, was not interfered with. There was a difference in the two classes of stone used in the building of the two portions. In the early charters mention was made of canals and islands which did not now appear, and the river was dammed up some way up the valley, close to the Norman quarry, and the stone was sent down on floaters or rafts. For the Early English work stone of a closer material, some little way down the valley, was employed, and to bring it along the same expedient was used; but more engineering was required, as they had to get the water to run the opposite way. There was at Rievaulx a large room under the refectory, and this was probably where the conversi were engaged. Singularly enough the church stood north and south, and did not orientate owing to the lie of the ground. In a farm-house close by the abbey the party were shown a tesselated pavement *in situ*, which was believed to fix the locale of the abbot's quarters. The "capella extra portas," in a fair state of preservation, was pointed out, and Dr. Cox said that its existence showed that nobody was allowed to enter the abbey except guests, and those who were professedly religious. He might suggest that a body having the weight of a national association might endeavour to induce the noble owner—Earl Feversham—to resume the excellent work carried on three or four years ago in pointing and preserving the abbey. It was time this obligation was entered upon, if the abbey were to be saved from further decay. Upon consultation by the officials, it was agreed that the matter might be dealt with at a council meeting of the Association; and it was hoped that, as Lord Feversham was one of the vice-presidents, he would do what he could in so important a matter. Dr. Cox called attention to a huge slab, now in a palisade enclosure, supposed to have belonged to the high altar. The shafts of the triforium, which he believed to have been of marble, were now all gone, though they must have added very much to the beauty of the choir. The Gothic arch now seen at the beginning of the transepts was 75 feet high. It terminated in corbels instead of the clustered pillars being carried to the bottom, and perhaps looked better now than when it joined up to the somewhat clumsy Norman nave. The refectory, with a perfect reading gallery, was pointed out; and it was said that the size of the infirmary indicated that those who, three days a week, were allowed to take flesh meats, would use that apartment. A doorway leading from the "farmery" garth to the farmery was shown, having a cusped head and a carving of the Annunciation, similar to one in the Fountains Museum. Such carving was not usual in Cistercian houses, where the carving usually dealt with the figure of Christ. A lancet window at the east end of the church was pointed out as being of great beauty; and it was observed that where ivy did not pierce into the masonry, it often acted as a preserver and not a destroyer.

PRIMITIVE GREECE.

ON Monday, before the Anthropological Section of the British Association at Cardiff, Professor G. Hartwell Jones read a paper on "The Barbaric Element in Ancient Greece and Italy." The civilisation of Greece and Italy, which saved Europe from stagnation on both sides, is valuable, he said, for the study of the growth of institutions; it was evolved slowly from an original barbarism. But, as the classics are now read, their scientific value is obscured. Their history occupies a peculiar position—(*a*) geographically, they were influenced by two streams of culture converging, the Aryan and Eastern; (*b*) their growth was parallel; (*c*) both were similarly, but independently, affected by immediate neighbours. (i.) Whatever may be the truth about the seat of the Aryans, first they came south by land; secondly, they brought with them a high capacity for development, but were certainly not as advanced as Gobineau assumed. (ii.) They were both affected by Asia Minor, Assyria and Egypt, the North Semitic races being their intermediaries. The materials for reconstructing prehistoric society must be sought in archæology and nomology, as much as the science of language; this was seen by Hehn. The purpose of the paper is to show by means of a few specimens the anthropological value of the classics, aided by the excavations of Schliemann, Helbig, Chierici, &c., and Sanscrit literature, in the (i.) material and social; (ii.) mythological and religious aspects of Greek and Italian life. (I.) They passed through three stages—(*a*) hunting; (*b*) pastoral; (*c*) agricultural; but the transition was gradual. The animals hunted were the stag, bison and probably the horse; they used the fire-drill; fishing was a recent invention; religion was marked by ferocity. The change to agriculture humanised them; they fed on milk, meat, salt, spice, mead, and roamed in search of fresh fields. The ox left a deep impression upon language, custom and myth. It was the unit of wealth and the medium of exchange; the horse was first used for the war chariot; the supervention of horse-breeding later is reflected in language. The word for harvest was not known in the holoethnic period. Some tribes remained at the agricultural stage throughout; others—*e.g.* the Dorians—retained their old passion. The pile dwellings of the Terramare reveal cattle-rearing giving way to husbandry and vine-culture; no doubt Epeiros would exhibit the same progress. The Pelasgoi were essentially agricultural; the transition in Italy is reflected in legend. The first plough was the branch of a tree. Tillage was practised before horticulture. Agriculture left a deep impression upon language and life. The family was highly important in Greek and Italian life. Marriage clearly passed through the (*a*) capture; (*b*) purchase stage, and once polygamy prevailed; so too, levirate, the vendetta, the suttee, but not polyandria, as Bachofen maintained. Their primitive savagery is proved by the destruction of the aged and infanticide. (II.) The crudest form of their religion is—A. Animism, really a primitive philosophy. It may be divided into (*a*) spiritism, (*b*) fetishism. In both the spirit is cajoled or overcome by magic. Nowhere is the power of abstraction stronger than in Italy, to some extent owing to the influence of Etruria; the fear of these nebulous impersonal spirits and ill-omened plants was common; the fetish was widely distributed—*e.g.* the oracle of Pelasgian Dodona, a kind of instinctive meteorology. Further, animism was (*a*) vague, and (*b*) hypocritical. B. Naturalism characterises Greek mythology especially. At this stage those objects were chosen which bore some resemblance to man and promoted his welfare. Magic gradually disappears, but the spirit is not omnipotent—he even betrays weakness. Environment exerts an important influence here—*e.g.* in Etruria and Greece. A kind of totemism frequently occurs—*e.g.* the Hera-idols of the megalithic tombs of Mycenæ. Ovid's "Metamorphoses" was an attempt to account for the impersonation. C. Anthropomorphism is a nobler and more intellectual form of worship, with which idolatry is closely connected; in Greece, which was influenced by Phœnician art, it reached its perfection; in Italy it remained an exotic in spite of Etruscan artists. Thus their religion was (*a*) developmental, (*b*) acquisitive. It would be seen upon examination that—(1) Their primitive culture was on the level of that of many savage races of the present time; (2) the civilisation of Aryan Europe, as a whole, begins with contact with the East; (3) the criteria must be sought in other prehistoric sciences, not philology alone; (4) their civilisation is of paramount interest to anthropologists.

Miss Soames has given 1,000*l.* to the extension fund of the Maria Grey Training College, which now amounts to 9,000*l.*

NOTES AND COMMENTS.

The constables who have charge of the South Kensington Museum are models of watchfulness. From the care they take in guarding the treasures, they are found to be far better guides to an object than the officials who have only a perfunctory interest in the place. Yet a thief on last Sunday morning very nearly succeeded in evading the attention of the guardians. The museum being open until 10 P.M. on Saturday, he contrived to conceal himself, and during the night wrenched a case from the wall to which it was secured, and abstracted two gold bracelets, one gold locket, one gold cross, four silver brooches, one gold brooch, two solitaires and one stone earring. The value of them is 66*l.* 4*s.* The thief was seen by a constable early on Sunday morning, but he contrived to escape from the building. He was arrested in Prince's Gardens. The Museum is so well protected by the police, it is one of the last places where a robber could be expected to succeed. The police can hardly undertake to be more careful than hitherto, and therefore to prevent a repetition, it will be necessary to increase the number of guardians.

A patent has been obtained by Mr. Taylor, of the firm of Messrs. Lessels & Taylor, architects, George Street, Edinburgh, for an invention which he believes will be the means of preventing many accidents on railway lines. Frequently trains leave the rails through the driver failing to observe that the signals are against him, and much human life and property has been destroyed. Mr. Taylor proposes to lay a wire from the signal-box alongside the line of rails for a considerable distance beyond the signal-post, while on the engine there will be a small brush or wheel, which, when coming against the wire, will cause an electric current to ring a bell near where the driver stands. When the line is clear the contact of the wheel or brush with the wire will not be possible, and it is only when danger is signalled that the alarm will be raised.

During several years the attention of the directors of museums and wealthy collectors has been turned towards the Borghese collection in Rome. A gallery containing Raphael's *Entombment*; Titian's *Divine and Profane Love*, *Prodigal Son* and *Three Graces*; Correggio's *Danae*; the *St. Anthony* and *St. John*, by Veronese; the *Diana* of Domenichino; *The Visitation*, by Giorgione; *A Holy Family*, by A. del Sarto, besides hundreds of other genuine works, would be able to supply deficiencies in many collections. There are also some examples of ancient art which are still more coveted. When it was rumoured that the owner was in difficulties the treasures seemed to be within grasp, and it is said that a sum of about half a million sterling was offered for a part of the collection. But the Italian Government would not allow the principal masterpieces to pass out of the country. Some wealthy members of the family appear to have interfered, and for a time, at least, the collection is secured against dispersion.

The report of the President of Queen's College, Cork, states that the Council instituted lectureships in certain subjects in which a want of special teaching has long been felt. One was architecture, and Mr. Arthur Hill was selected for the lectureship. It is expected that the new courses will be commenced during the coming session. The authorities of Queen's College have set an example which should be imitated in other colleges. The engineering classes in the colleges of Belfast, Cork and Galway, have been successful, and we see no reason why architectural classes could not also send forth useful men. According to the report, the college itself might well provide practical examples of buildings which would benefit all the students as well as those in the architectural class. The want of room for a constantly increasing store of books becomes more pressing every year. Thousands of volumes have been stowed away in the entrance tower. The examination hall has been lined with shelves now fully stocked. The wall space in the geological lecture-room has been utilised. The librarian's private room has been annexed. A new library, therefore, appears to be urgently needed. Plans for such a building, including students' reading-room, waiting-room, &c., were made some years ago, but their adoption was prevented by various obstacles of a temporary nature. Another urgent want is that of a new chemical laboratory. In the present one there is accommodation for only thirty students. Of late years there has been an average attendance of nearly twice that number. Hence, the Professor has been obliged to divide his class into two sets at a cost of double labour, and of complicated arrangements to avoid interference with other lectures. A new laboratory could be provided in the building containing the new library.

The judges in the courts of Rennes will shortly have to give a decision which will throw light on the law as it relates to vandalism in France. The action is taken by the Municipal Council of Lorient against some of the inhabitants, most of them being young men, and the damages claimed amount to 2,000*l.* A statue of a local poet named Brizeux was lately placed in a public place of Lorient. But it gave offence to a party of young people, who may have had exalted theories about poetic composition. Accordingly, in June of this year the statue was overthrown, defaced and covered with tar. Action was taken against the vandals, and they were mulcted in damages, but they have appealed to the superior court of Rennes, with what result remains to be seen. The Municipal Council have decided to make an act of reparation to the deceased poet. On September 12, which is the anniversary of his birth, the members will march in procession to the cemetery, and deposit a wreath upon the poet's tomb. Throughout the day the statue will be draped in black.

Among the examples of primitive Irish art visited by the Royal Society of Antiquaries in Ireland during the excursion in Kerry, was the Oratory of Gallerus, which was supposed by Dr. Petrie to date from the fifth century. The door is 5 feet high and 2½ feet broad. At one end of the building is a small window, the frames and sills of which consist of one stone, with hardly a mark of a chisel. The building is about 20 feet long, 10 feet broad, and 20 feet high, and the walls are 4 feet thick. The joints of the stones are so perfect that it would be difficult to get a knife point between them. No mortar of any kind has been used in the structure. Some conjecture that these beehive-shaped structures were erected round a perfectly-formed mould of earth, and the keystones wedged in at the top. When completed the earth was cleared out through the doorway, and the walls finished off inside; but this is a speculative idea. In reference to these buildings and their origin Miss Stokes writes:—"It would appear that the monks adopted the method of building them practised by the natives before the introduction of Christianity, gradually making such modifications in form as their difference of purpose and some traditional usage required. Within the stone fort now become Christian, or the cashel built in imitation of it, the first Christians found shelter for their little oratories, their round beehive huts, their wells, gardens and *leachta*, or burial-grounds or *leabanmarb hars*, beds of the dead, as they are called, the oratories of these periods, and within these cashels are angular, oblong structures, with walls either sloping in a curve towards the roof, or built in steps, and often formed like upturned boats. They measure on an average 14 feet long by 9 wide and 12 feet high." It will be seen, therefore, that Gallerus is much larger than the average.

The house in the Rue Berryer, Paris, where Honoré de Balzac died, is about to be demolished. It was purchased by the Baroness Solomon Rothschild, in order that the site could be utilised to increase the grounds attached to her ladyship's mansion. In order that some record might be preserved of the last habitation in Paris of the greatest of French novelists, the Baroness has had no less than thirty-five photographic views produced, which represent the greater part of the house. There is no architectural merit about any of the rooms, but hereafter people may be glad to have representations of them, however commonplace may be the style. An album containing the photographs has been deposited in the Musée Carnavalet, where so many things relating to Paris are to be found. The door of Balzac's bedroom has been also sent to the Museum.



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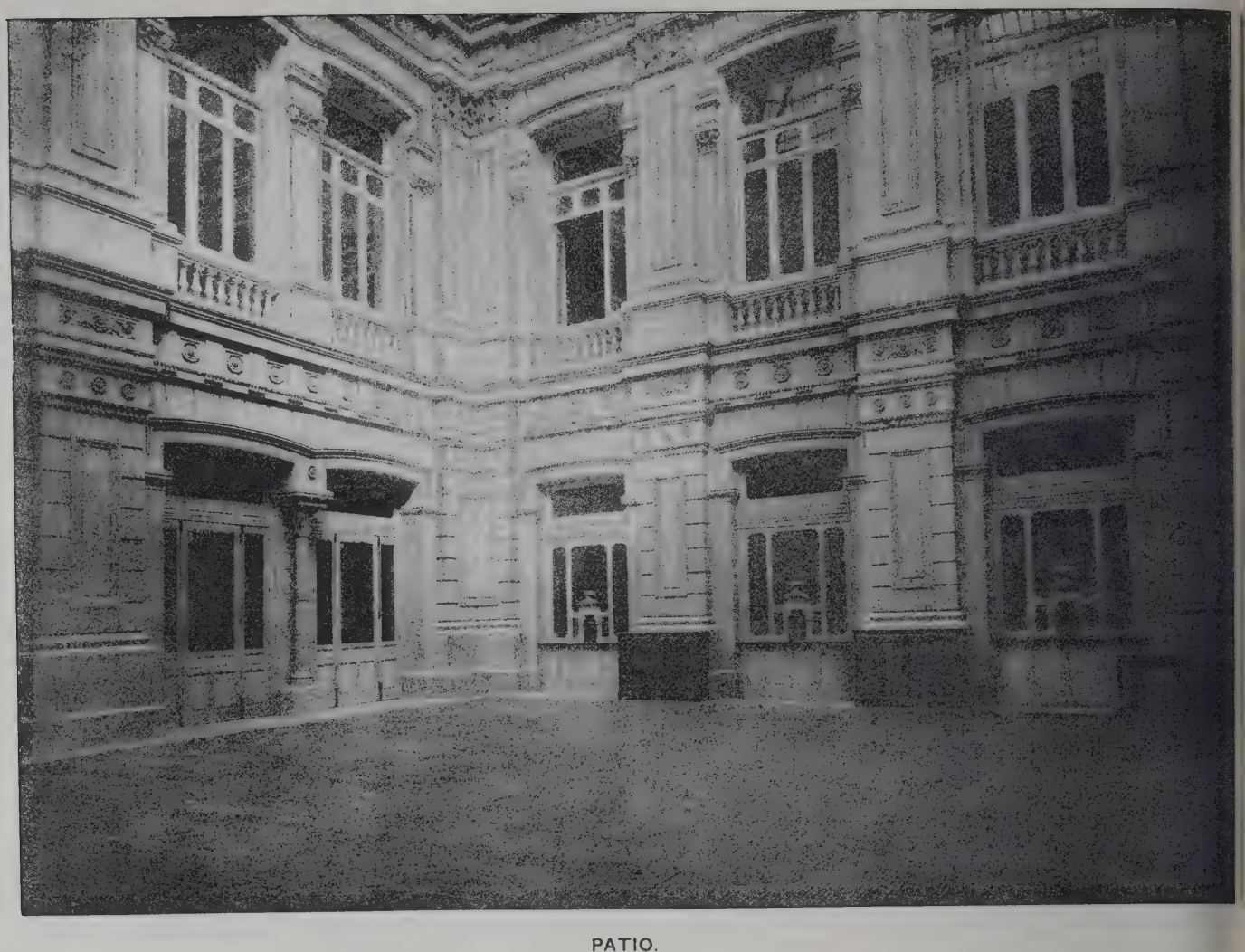


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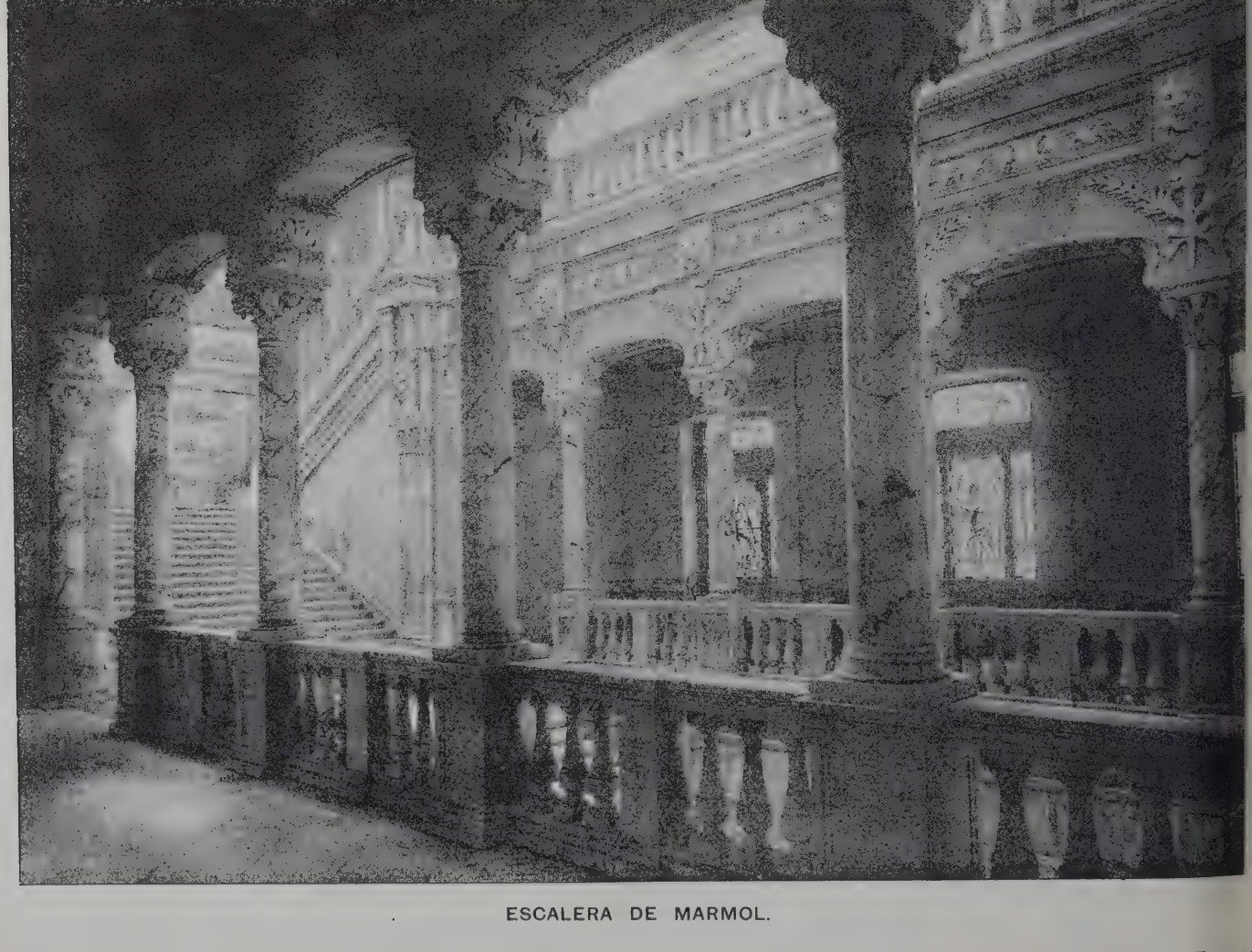
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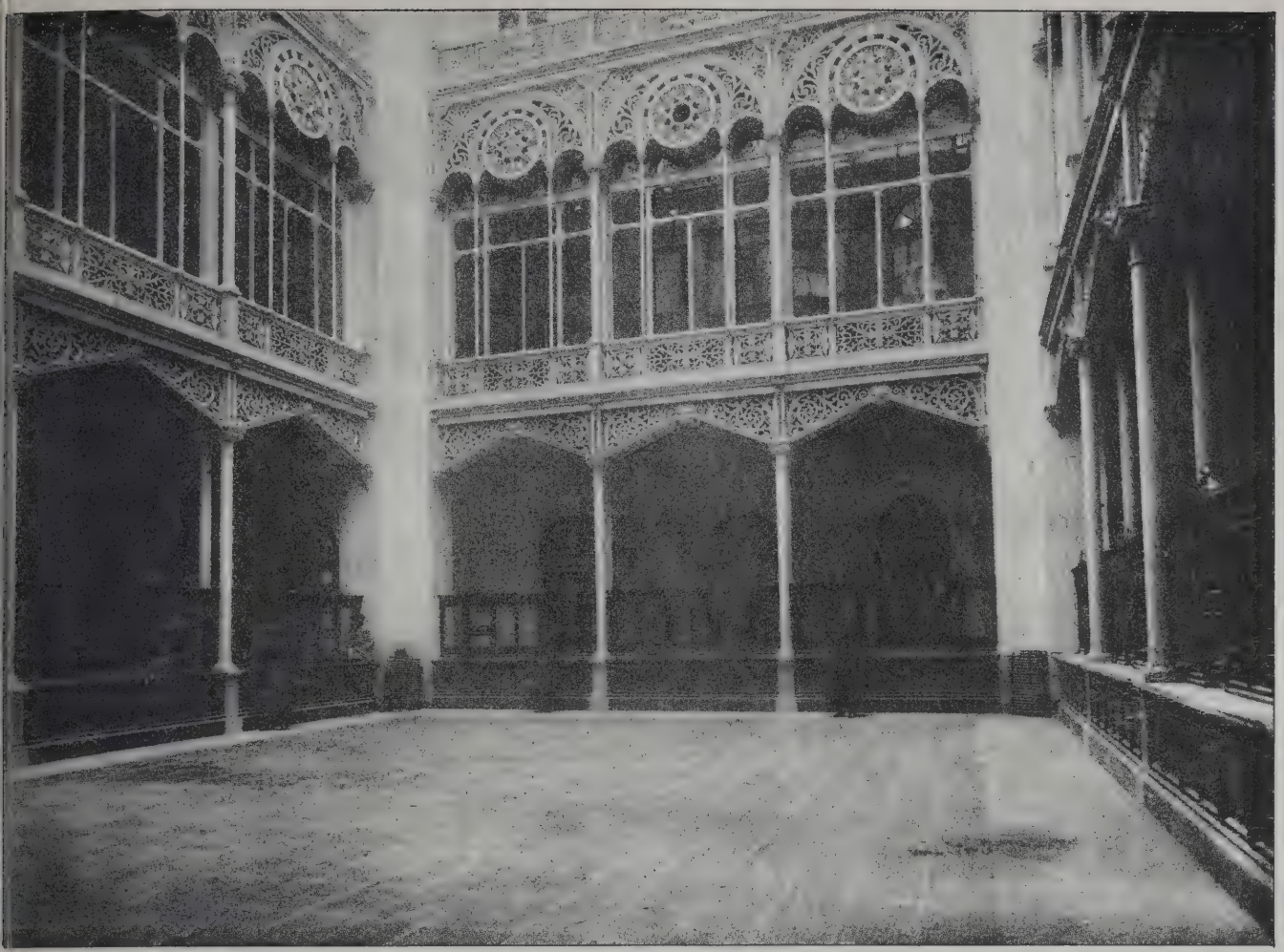
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ESCALERA DE MARMOL.

NATIONAL BANK
Architect: Se

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CAJA DE EFECTIVOS.



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SALA DE JUNTAS.

ADO, MADRID.
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I. PRADO, MADRID.

ADARO, Madrid.

ILLUSTRATIONS.

PANCO DE ESPANA, MADRID.

THIS imposing pile, said to be the largest and handsomest structure for commercial purposes in Europe, was completed and occupied in March last, and holds the same position in Spain as the Bank of England does in London. The main frontage is to the Prado, a magnificent boulevard some two or three miles long, where, in the season, all the nobility and *élite* of Madrid may be seen driving or riding very much as in our Rotten Row. The main front extends nearly 550 feet, and has three entrances, whilst another entrance is in the north front—to the Calle el Calla. The building rises to a great height, the principal rooms being 25 feet high in the clear. Above the ground level are five floors, four of which are appropriated to the business of the bank, and the upper or third floor is altogether set apart as residences for the staff and servants, many of whom live on the premises. The two principal cashiers have commodious suites of apartments at each end of the second floor. The principal entrance is from the Prado, where a magnificent marble staircase, built by workmen specially brought over from Italy, leads to the principal floors. Three more main staircases lead up from the other entrances, in addition to which there are four hydraulic hoists or lifts. Two large central courts, one on each side the main entrance staircase, give light to the interior of the pile. Nearly the whole of the basement is taken up with strong rooms for storing bullion and jewellery, and surrounding the whole building, below the street level, runs an ambulatory, where a number of armed guards parade day and night, and from where, by means of niches opening into the strong rooms, they can see all that goes on in them, and they have instructions to fire upon any burglar who may have gained an entrance to these treasure-houses. The remaining portion of the basement is used for the boilers of the heating apparatuses and for storage of fuel. There are twelve boiler-rooms and twenty-one boilers, from which radiate no less than 12 miles of piping, traversing the whole building. At suitable positions coils of piping are introduced covered with handsome electro-bronzed iron coil cases, of which there are 130. The contract for the heating has been carried out very successfully by Mr. Renton Gibbs, of Liverpool and Birmingham. The basement is fitted up with a series of strong-rooms, eight in number, for various purposes, such as notes, bullion, silver, copper, securities, &c. Each of these rooms is secured by massive steel doors, with gates of heavy description, furnished by Messrs. Hobbs, Hart & Co., of London, corresponding with those supplied by them to the Bank of England and branches. This firm have also produced some specially-designed locks for multiple control. The weight of the steel doors, with the frames and gates, ranges from 2½ to 4 tons each, and are much admired. Messrs. Hobbs, Hart & Co. are now completing for this Bank probably the largest steel-room in the world, being over 50 feet in length, 26 feet in width and 17 feet high, with a staircase and gallery and wrought-shaped balcony. The entrance is protected by another of the "Hobbs-Hart" steel doors as before described, and a manhole door of corresponding strength. There are four pairs of steel shutters to correspond, of similar strength, over 10 feet high. The electric lighting of the building is taken from the mains of the German company, between whom and the English company a keen competition exists for the lighting of Madrid. The architect for this important building is Señor Eduardo Adaro, of Madrid.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO 401.—VIEW OF ROME. [THE LATE G. BASEVI.]

The Council of the Yorkshire College, Leeds, have appointed to the post of lecturer on sanitary engineering Mr. William Spinks, engineer to the Manchester and District Sanitary Survey Society, and of the firm of Spinks & Beever, civil engineers, of Manchester.

YORK MINSTER.

ONE of the first visits of the members of the British Archæological Association on the occasion of the meeting at York was to the cathedral. It was anticipated that Dean Purey-Cust would guide the visitors, but owing to his absence the task devolved on Canon Raine. On the party assembling, the Canon spoke of the importance of the building in the eyes of Yorkshiremen. Any harm to it would cause something like an insurrection in the county; while, if another fire arose, we should see, as had been witnessed before, a surprising exhibition of generosity. The reverence that all the people of Yorkshire had for that glorious fabric was a matter of common knowledge. Yorkshire was a huge county, cut into various sections, and this was the great centre which bound those sections together. The history of York Minster practically began on Easter Day, 607. A little wooden chapel had been put up, and in this the King of Northumbria, who had been brought over to Christianity by Paulinus, was baptized. Afterwards Edwin built a stone church, keeping the little wooden chapel inside it as a sort of relic. The King of Northumbria being killed in battle a very few years after, the church was finished by Oswald, one of his successors. That church was improved and enlarged in the same century by Wilfrid, the founder of Ripon, but in the middle of the eighth century the great changes that were taking place in York rendered a new church necessary. York had become a great University town. The School of York was something more than a school, in our acceptation of the word; it meant a great university. The York university was one of European fame, for from it the French universities took their origin; indeed, in York they had practically the starting point of the whole system of scholastic life throughout Europe. A new cathedral was, therefore, built, and it continued till the Norman Conquest, when William, in revenge for the defeat of some of his troops at York, destroyed the whole place, burning the cathedral and town. Consequently one of the first duties that fell to the first Norman Archbishop, Thomas I., was to build a new cathedral, and he constructed it in the Norman style, resembling Southwell very much. In the latter part of the next century, Archbishop Roger, a Frenchman, who was a great builder, had an opportunity of showing his architectural skill in repairing the ravages of a fire in the choir. They did not want much excuse in those days for introducing a new style of architecture, for they were only too glad very often to pull down the most glorious fabric simply to bring in something new. Roger built a new choir, and no change was made after that till the middle of the thirteenth century, when the architectural spirit had revived a little bit, and they thought they had in justice some excuse for making a little further change. The northern transept was undertaken by the Chapter of the time, and the southern transept was begun almost contemporaneously by the Archbishop, Walter de Grey, who built the nave of Ripon Cathedral. The transepts must have been built between 1239 and 1250; at all events, the south transept was complete when Walter de Grey's death took place, for his remains were laid there, and the visitors would presently see his beautiful towering monument. They had got now the old Norman nave, the Transitional choir of Archbishop Roger and two beautiful Early English transepts—what were they to do next? They began to build a new nave, Archbishop le Romayne laying the foundation-stone on the south corner about 1292. Between then and 1340 the existing grand nave was built. After an interval they turned their eyes to the choir, which must have been beautiful, judging by the remains, and it was resolved that it must come down. In 1363 Archbishop Thoresby began a new choir at his own expense, and he lived long enough to finish the four easternmost bays. On his death he was laid in front of the great east window, at his side being the remains of six other archbishops, he having removed their bones from different parts of the church lest they should be disturbed by the restoration which was going to take place. Thoresby died in 1373, and the Chapter did not complete the choir to the central tower till about 1405. It was a time when money was very scarce, and there was also very great difficulty in keeping masons, as when any royal personage or statesman wanted any work done he had a sort of press-gang system in operation upon the workmen. The real difficulties of the Chapter commenced when the Norman tower was reached. They did not dare to pull it down because that would have brought down the choir, nave and transepts, but they must, he thought, have made some attempt at that, for in one or two places there were signs of shrinkage in the neighbouring arches, and they must have taken warning by what they saw and desisted from the attempt. But they recast the Norman pillars with Perpendicular architecture, a very dangerous and critical operation. He (Canon Raine) regarded the choir screen—which on the face of it seemed so light and elegant, but in reality was many yards thick—as being actually a great buttress to the tower. It was found necessary to put it there in order to make everything quite safe. With that work completed they

had the interior of the fabric as it stood now. In the latter part of the fifteenth century the two western towers were put up, and the pinnacles and flying buttresses. Then there was the chapter-house, and that was a great difficulty in the architectural history of York Minster. They had no documentary evidences as to the building of it, but could form an idea of its date from the architectural details. It was Early Decorated work, and must date from 1280 downwards for twenty or fifty years. That the work must have been done very leisurely was proved by its elaboration. In viewing the Minster the thought arose, How did they get all that work done? The fact was that they only had a limited fabric fund of their own, but they could rely without any hesitation upon the unlimited generosity, particularly of all the people of Yorkshire. Any one who read the wills of the Yorkshiremen of the time when the work was going on would see how bequest after bequest was left for its continuance, the sums ranging from *6d.* to many pounds—and they must be multiplied by a considerable amount to bring them up to our present money value. It must be remembered also that the Chapter had their "brief bearers" going about the country begging money in every direction. Again, there were the offerings made at the shrine of St. William, the patron saint, and the moneys placed in the alms bags, which went for the most part to the great work of restoration. Canon Raine then mentioned the fires caused by Martin, who conceived a dislike to the organ, and in trying to burn it down destroyed the choir roof, and that caused by the carelessness of bell-ringers in 1840, which burned off the roof of the nave. How the stained-glass escaped was a marvel. Its preservation in the seventeenth century they owed to Fairfax, who, at the siege of York, ordered his men to blow out the brains of any one who interfered with it. Canon Raine pointed out the well-known Bell Founder's window, the Five Sisters' window—only so called because of the sisterly resemblance of one window to another, and containing some of the earliest, plainest glass they had; and afterwards the great east window, where the stone and the glass work help each other so admirably. The latter illustrates the Bible history, and is not only the largest in the country, but one of the most pleasing Perpendicular windows extant. The shrine of St. William, said the Canon, was in the place of the present altar. The old altar stood one bay forward from the present one. It was overlaid with gold and silver, and to set it off two great chancel windows, one depicting the life of St. Cuthbert and the other the lives of St. Wilfrid and St. John of Beverley, were built. The visitors afterwards descended to the crypt, where the remains of Saxon and Norman work are to be seen, and also visited the ornate chapter-house.

THE DEPARTMENT ART SCHOOLS.

IN his report on art schools and classes Mr. F. B. Barwell states:—

The duties undertaken by local committees appear to me to have been better fulfilled than formerly, and it has been comparatively rarely that one has had to report any laxity on their part in visiting the classes and signing the attendance registers. Schools of art and art classes, to which my attention has been more particularly directed, are, generally speaking, improving in their practice, and attendance a good deal augmented in consequence of the spread of drawing in elementary schools, teachers and pupil-teachers finding it more necessary than ever to qualify under our rules. The introduction of light and shade as one of the five subjects in second grade has further stimulated these classes, and it is found to have rendered drawing a great deal more popular than formerly. In schools of art the necessity the masters are under to pass their pupils in freehand outline in order to obtain the grant causes, in my opinion, a longer time to be spent on that stage than would be otherwise desirable, and as the natural tendency is for the standard to become gradually raised, the result is likely still further to retard the progress of the student towards higher work. I would myself suggest that the standard for freehand be lowered rather than raised.

Many of the art masters find it difficult to resist the demands of their pupils in the morning classes to waste their time in copying from landscape examples (many of them chromo-lithographs) on the plea that their classes would otherwise materially diminish. I am convinced, from the experience of those masters who refused to be dictated to, that they are mistaken. If these same pupils are prepared to spend, as they nearly all do, some years of drudgery in learning to play only moderately well on a musical instrument, they would, if the master were firm enough, go through the necessary drill in order to acquire a respectable facility in art. Nor should these morning classes be treated as of no consequence: their higher fees help to keep the school going, and they belong to the buying classes, for whom the manufacturer of artistic production caters, and, unless those classes have their taste cultivated in good directions, the demand for the better kinds of art will not spread, and the manufacturer will remain content not only to supply bad things but to dispense with well-trained designers.

In all schools of art there are a certain number of students who very naturally desire to paint, and there is no better practice for such than the study of still life, but it seems as if the majority of the teachers are unable to get out of the well-worn groove of combining a number of objects that have no sort of connection with each other, nor with the ever-present piece of drapery or bas-relief as a background. The groups have no possible human interest such as we see in the accessories of many of the greatest painters of almost all schools, and are, in general, much too elaborate for beginners to cope with successfully. In placing casts, especially busts, they are generally presented to the student with the greater part in deep shadow, the strongest relief being wrongly considered an almost necessary condition.

In England, the desire to make use of the money transferred by the Local Taxation (Customs and Excise) Act to the county or borough councils for educational purposes is very widespread, and in one large city where the existing rates reach about *9s. 6d.* in the pound, the local authorities have resisted the temptation to apply the money to the relief of rates, and have resolved to use it entirely for educational purposes.

In Scotland, many of the schools of art are mere adjuncts to intermediate or high schools, and are not worthy of the name, the bulk of the art (?) work being second grade drawing of a very rough kind, done by the boys and girls in the daytime, the evening classes in such instances ranking no higher in aim than an ordinary art night class. On the other hand, in the large cities, the schools of art occupy a very good position in the kingdom.

Through the connection recently established in Ireland between the Department and the large training college at Drumcondra, and the still larger organisation of the Christian Brothers, drawing under the Department's rules in Irish elementary schools is likely to spread, science having for some years obtained a firm footing there.

THE HISTORY OF CARTOGRAPHY.

THE address in the Geographical Section of the meeting of the British Association at Cardiff was delivered by Mr. E. G. Ravenstein. He said:—We can hardly conceive of Joshua dividing the Promised Land among the twelve tribes and minutely describing their respective boundaries without the assistance of a map. A plan of Rome, the only document of the kind which has survived, is engraved on slabs of marble on a scale of 1·300, and was originally fixed against a wall of the Roman town hall, so that it might be conveniently consulted by the citizens. Of the existence of earlier maps of the world, or even of provinces, we possess only a fragmentary knowledge. That maps grew popular at an early age is proved by Aristophanes, who, in his comedy of "The Clouds," 423 B.C., has a map of the world brought upon the stage by a disciple of the Sophists, who points out upon it the position of Athens and of other places familiar to the audience. A real advance in cartography was made when Dicæarch of Messena (390–290 B.C.) introduced the parallel of Rhodes. This "diaphragm" was intersected at right angles by parallel lines representing meridians. Ptolemy of Alexandria introduced reforms into the methods of representing the earth's surface which fully entitled him to the foremost place among ancient cartographers. Before a map like his could be produced much preliminary work had been accomplished. The gnomon, or sun-dial, an instrument known to the Chinese 600 years before Christ, had long been used for the determination of latitudes, and the results were relatively correct, although uniformly subject to an error of sixteen minutes, which was due to the observers taking the altitude of the upper limb of the sun when measuring the shadow-case by their dial, instead of that of the sun's centre. It was known, likewise, that differences of longitude could be determined by the simultaneous observation of eclipses of the sun or moon, or of occultations of stars, and Hipparchus actually calculated Ephemerides for six years in advance to facilitate computations. Ptolemy himself suggested the use of lunar distances. But so imperfect were the astrolabes and other instruments used by the ancient astronomers, and especially their time-keepers, that precise results are quite out of the question. Ptolemy, in fact, contented himself with accepting eight latitudes determined by actual observation, of which four were in Egypt, whilst of the three longitudes known to him he only utilised one in the construction of his map. No copy of Ptolemy's original set of maps has reached us. An examination of Ptolemy's maps shows very clearly that they were almost wholly compiled from itineraries, the greater number of which their author borrowed from his predecessor Marinus. During the "Dark Ages" which followed the dismemberment of the Roman Empire there was no lack of maps, but they were utterly worthless from a scientific point of view. The achievements of the ancients

were ignored, and the principal aim of the map-makers of the period appears to have been to reconcile their handiwork with the orthodox interpretation of the Holy Scriptures. Hence those numerous "wheel maps," upon which Jerusalem is made to represent the hub, whilst the western half of the disc is assigned to Europe and Africa and the eastern to Asia. The Arabs were great as travellers, greater still as astronomers, but contemptible as cartographers. Their astronomers, fully possessed of the knowledge of Ptolemy, discovered the error of the gnomon, they improved the instruments which they had inherited from the ancients, and carefully fixed the latitudes of a great number of places. Quite a new epoch in the history of cartography begins with the introduction of the magnetic needle into Europe. It is only natural that the Italians, who were the foremost seamen of that age, should have been the first to avail themselves of this new help to navigation. Germany, debarred from taking a share in the great maritime discoveries of the age, indirectly contributed to their success by improvements in mathematical geography and the introduction of superior instruments. The navigators of the early middle ages still made use of an astrolabe when they desired to determine a latitude. Great difficulties were experienced in the observations of longitudes. Lunar eclipses were most generally made use of. A congress of Spanish and Portuguese navigators met at Badajoz and Yelves in 1524 for the purpose of laying down the boundary line, which Pope Alexander VI. had drawn at a distance of 370 Spanish leagues to the west of Cape Verd Islands, to separate the dominions of Spain from those of Portugal. Not being able to agree either as to the length of a degree, nor even as to that of a league, they separated without settling the question placed before them. So uncertain were the results of observations for longitude made during the sixteenth and seventeenth centuries that it was thought advisable to trust to the results of dead-reckoning rather than to those of celestial observations. But the method of dead-reckoning is available only when we have a knowledge of the size of the earth, and this knowledge was still very imperfect, notwithstanding the renewed measurement of an arc of the meridian by Snellius, the Dutch mathematician (1615). This measurement, however, is remarkable on account of its having for the first time applied the exact method of triangulation to a survey. The problem of measuring the ship's way had been attempted by the Romans, who dragged paddle-wheels behind their ships, the revolutions of which enabled them to estimate the distance which the ship had travelled. The eminent position which Italian cartographers occupied during the fourteenth and fifteenth centuries had to be surrendered by them, in the beginning of the sixteenth, to their pupils, the Portuguese and Spaniards, upon whom extensive voyages and discoveries had conferred exceptional advantages. These, in turn, had to yield to the Germans, and later on to the Dutch, who were specially qualified to become the reformers of cartography by their study of mathematics and of the ancient geographers, as also by the high degree of perfection which the arts of engraving on wood and copper had attained among them. German mathematicians first ventured to introduce the long-neglected geographical projections of Hipparchus and Ptolemy, and devised others of their own. The German cartographers of that age are to be commended, not because they copied Ptolemy's maps, for in this they had been preceded by others, but because they adopted his scientific methods in producing maps of their own. Their reforms began at home, as all reforms should. They were amply supported in their efforts by the many astronomers of note of whom Germany then boasted, and by quite a staff of local "geographers," of whom nearly every district of the empire boasted the possession of one. Perhaps the earliest general map of Germany, and certainly one of the most interesting, was that which the famous Cardinal Nicolas of Cues, or Cusa, completed in 1464, the only existing copy of which is to be found in the British Museum, where it was "discovered" by Baron Nordenskjöld. Mr. Ravenstein continued this historic sketch of progress, noting the introduction of the telescope, the theodolite, the sextant and the camera, the discoveries of the aberration of light and of the mutation of the earth's axis, the invention of instruments for measuring the depth of the ocean and the use of colour in maps. The credit of having done most towards the promotion of cartography in the course of the eighteenth century belongs to France. It was France which first equipped expeditions to determine the size of the earth; France which produced the first topographical map based upon scientific survey, a work begun by César François Cassini in 1744, and completed by his son five years after his father's death; it was France, again, which gave birth to D'Anville, the first critical cartographer which the world had ever seen. D'Anville (1697–1782) swept away the fanciful lakes from off the face of Africa, thus forcibly bringing home to us the poverty of our knowledge, and boldly refused to believe in the existence of an Antarctic continent carrying half the southern hemisphere. Whilst France led the way, England did not lag far behind. Since the beginning of the present century Germany has once more become the headquarters of scientific cartography, and this is due as much to the inspiriting teachings of a Ritter and a Humboldt as to the general culture and scientific training, combined with technical skill, commanded by the men who more especially devoted themselves to this branch of geography, which elsewhere was too frequently allowed to fall into the hands of mere mechanics. And now, at the close of this the nineteenth century, we may fairly boast that the combined science and skill of surveyors and cartographers, aided as they are by the great advance of the graphic arts, are fully equal to the production of a map which shall be a faithful image of the earth's surface.

FOUNTAINS ABBEY.

THE members of the British Archæological Association were invited by the Marquis of Ripon, K.G., to luncheon at Studley Royal, and his lordship was thanked not only for his hospitality, but for the care he has taken of the remains of Fountains Abbey. The building was described by Mr. Loftus Brock.

At the commencement he referred to the movement which took place about three generations after the Norman Conquest, which resulted in the formation of an enormous number of religious houses throughout the country. Following those under Benedictine and Augustinian rule came the foundation of Cistercian monasteries, resulting from a desire for more stringent rule of life among both ecclesiastics and laymen. The abbey at Fountains was the outcome of this rising. The Benedictine Abbey of St. Mary's, York, had become so wealthy that the monks came to be more careful for their ease than for the service of their great Master; and certain monks of that house banded themselves together to urge upon the abbot their wish for a stricter life, and begged for leave to found another Cistercian Abbey, four having already been instituted. They were treated, as minorities often were, with little respect, being taxed with a wish to get rid of their vows. They found a friend in the Archbishop of York of that period. That dignitary visited St. Mary's one day, according to his right as metropolitan, and at first, after he had been refused admission, the monks declined to listen to his address. Consequently the Archbishop, finding that the thirteen monks were in earnest, helped them to Fountains, and gave them certain churches of no great value at that time. The valley was not as now, and much of the stone for the building of the abbey must have been cut out of the rock close by. Going to Fountains in December 1132, they took shelter under spreading trees. A few winters with slender resources led them to think of leaving England; but just at that moment money began to pour in, the Dean of York joined them, and they began to erect the church. Mr. Brock then proceeded to point out the different features of the abbey, and indicated how much of the original Norman structure still remained as part of the present fabric, stating that these portions showed that the original buildings were of the same dimensions as those now existing. Afterwards, however, the monks of Fountains interested themselves so closely in the election of a certain Archbishop of York that their persistency aroused the ire of the minority, who came to Fountains and practically destroyed the work of so many arduous years. Mr. Brock said that the fact that the interior of the buildings had been plastered and whitewashed seemed to have escaped notice, but the evidence was abundant. The nave was marked by great dignity. In his view, there were only 34 or 35 ritual monks in the Abbey; and although there might be lay brethren there, he did not believe in the existence of conversi, either here or elsewhere. Both the east and west windows of the church had been inserted in place of the Norman work. In York an old doorway had been built into the church of St. Denis because of its beauty; but, speaking generally, they must never look for the exhibition of any regard in those times for anything previously existing, since when they wanted a change they made it whether the new were better than the old or not. At the eastern end of the monks' choir tiles had been inserted here and there to increase the resonance of the building; but these were not often met with, and it might be inferred that the plan met with no great success. The tower was originally built at the intersection of the transepts and the nave; but the erection of a large, ugly buttress internally, and shrinking elsewhere, showed what resulted, and only one complete pier now remained. The present tower, in almost an entirely complete state, standing at the north end of the transept, was built by Abbot Huby, 1494. It was a most interesting specimen of the Perpendicular. The tracery of the windows was very plain and without cusps, and yet it was most effective. The Cistercian monks, however, did not require, in accord with their ascetic life, architecture of an expensive kind. But the tower was erected 300 years after the monastery was founded, and between the two periods the monks had become less fond of rigid living and spent their money in fine buildings. The magnificent choir, with its nine altars, preceded the erec-

tion of the nine altars at Durham by 30 or 40 years. The choir was, in Mr. Brock's view, the most masterly piece of Early English in Yorkshire; the choir itself was vaulted, and besides having a slender and delicate column dividing it from the transepts, the column was doubtless banded, and had pretty shafts of polished marble, making them more charming than now seemed to have been the case. Passing through the cloister court, the party found themselves in the chapter-house divided into three aisles, which must have been vaulted. Here the abbots were buried, and several tombstones had been discovered. The refectory was shown, and Mr. Brock thought the question of which was the kitchen and which the warming-house had not yet been decided. The day-room, dormitory, prisons and infirmary were next shown. The latter had been one of the largest of the group of buildings, and was probably erected 1250.

PIETRO ROSA.

THE death is announced of the Senator Pietro Rosa, the excavator of the Palace of the Cæsars. He died, says a correspondent of the *Scotsman*, on the scene of his grandest achievement, the Palatine Hill, in the house built for him by Napoleon III. more than twenty years ago, when, at the instance of the Emperor, he undertook the excavation of the birthplace of the Eternal City.

Born November 10, 1810, in Rome, of a distinguished family, which among its scions could point to the artist and man of letters, Salvator Rosa, he gave early indications of special genius at the Academy of St. Luke, where he carried off prize upon prize, and was, in consequence, while still a youth, voted an Honorary Fellow. He worked for some time in the studio of the great Canina, and thereafter became domiciled with the Borghese family, at whose instance he rearranged their celebrated gallery, and made both their villa and palace the perennial resort of the archæologist and the art student from every clime. In his thirty-seventh year, Pius IX.'s short-lived incursion into Liberalism found an enthusiastic auxiliary in the now-famous architect and connoisseur, who for a time abandoned his studies to organise the civic battalion of the Campus Martius But Radetsky's advance on Ferrara was too much for the vacillating Pontiff, and the Liberal cause had to cave in for a season, till in 1849 the triumvirate of Mazzini, Saffi and Avezzana took the place of the fugitive Pius, and presently had to defend itself against the expeditionary force sent by Republican France to suppress it. Again Rosa came to the front, working as Michel Angelo did at the siege of Florence, and not only designed the fortifications, but took a soldier's part in manning them. He shared in the victory of Garibaldi on April 30, and also in the collapse of the triumvirate a few weeks after it, losing the patronage of the Borghesi and coming so pointedly under the censure of the reinstated Pope, that he had to go into hiding in a secluded vineyard near the catacombs of St. Sebastian on the Appian way.

In this retreat he resumed his studies, setting himself to trace the grass-grown highway and its sepulchral monuments, and crowning his work with a singularly accurate and detailed plan of it between Rome and Albano. This, with the relative letterpress, found special favour with the German Archæological Institute, and stimulated him to extend his studies in the Alban territory, so as to include the magnificent villa erected by Pompey, and afterwards extended by the Cæsars on the left side of the Appian. Then, too, he began the unique work, unfortunately never completed, the topographico-archæological maps of Latium, which, even in its unfinished state is the admiration of every scholar who has had access to the library whose walls it adorns. Special results of this study, however, are now the common possession of cultured humanity—his identification of the site of the temple of Diana on Lake Nemi; that of the battlefield on the Allia, and even his elaborate indication of Horace's villa near Rocca Giovine, though this has had its plausibility lessened by the masterly vindication of the older site on the Digentia by that able Dublin scholar, the Right Hon. J. A. Lawson.

About the years 1863-64-65, the Emperor Napoleon, for dynastic reasons, undertook his "Life of Julius Cæsar," and of the many *savans* whom he pressed into his service, Pietro Rosa was among the first. Having purchased for a very large sum the Farnesian Gardens on the Palatine, he entrusted Rosa with the excavation of them, in the hope, destined to be so brilliantly justified, that the palace, or rather palaces, of the Cæsars would at length be brought to light. Having built a house for him on the hill itself, just fronting the Basilica of Constantine, the Emperor wisely left him uncontrolled as to action, and practically unlimited as to funds, and in a few years the results evoked the admiration of even the German Institute in the capitol—the most formidable, and not always the most amiable, tribunal to which the Italian or French archæologist could appeal. It is to Rosa that the scholarly as well as the unlettered tourist is now indebted for whatever of distinctness he carries away with him in his impression of the Palatine, and though controversy has arisen, and will never, probably, be laid, as to the absolute certainty of some of Rosa's "identifications," it is safe to say that those suggested in their place are much more vulnerable at the hands of criticism. Unfortunately, the events of 1870 put it out of the Emperor's power to assist Rosa towards the completion of his work. The Palatine had to be ceded to the Italian kingdom, and though Victor Emanuel's Ministers wisely retained the veteran excavator at his post, they have never been able to keep him in funds sufficient for the prosecution of his operations. As if to compensate for his restriction as to means, the Italian Government increased the area of his nominal activity, making him superintendent of the (contemplated) excavations, not only of the Palatine, but of the whole Pontifical territory, including Ostia, on the Latin shore, the villa of Hadrian, and the Roman Forum itself. The little he has been able to do in those fields is now known, through innumerable guide-books, to every tourist; that little, as in the case of the Colosseum, amounting only to an indication of what might be done if the Government could spare from the Budget of Public Instruction an adequate allowance for carrying it to completion.

Of late years Rosa has been in the background, enjoying the honorary post of Inspector-General of Antiquities and the Fine Arts, while the active work of excavation, such as it is, has been admirably done by Fiorelli and Lanciani, the former eminent for his brilliant operations at Pompeii, the latter famous for his bringing to light the House of the Vestals, to say nothing of other scarcely less admirable monuments of sagacity, scholarship and perseverance. Neither of those distinguished men have reason to be other than proud of their predecessor, acknowledged as he is by archæologists of every school to have laid their common "mystery" under the deepest obligation. To the stranger in Rome few more interesting sights met the eye than that of the veteran excavator guiding some royal or patrician or world-famous guest over the undulations or through the labyrinth of the Palatine, explaining to them the structures he had brought to light and dwelling wistfully on those he knew to lie beneath the surface, whose discovery, however, was destined for other hands. That sight had recently become rarer and rarer, till

One morn we missed him on the accustomed hill.

Perhaps no Italian of this century possessed so many honours, decorations and marks of respect as Pietro Rosa, from St. Petersburg to Madrid, from Berlin and Vienna to Rio Janeiro. To say nothing of the literary and scientific bodies of his native land, the insignia of royal esteem or of learned and artistic admiration came to him in showers. His funeral on the day after his death was attended by all that was most distinguished or estimable in Rome, and "he now rests from his labours" in the Campo Verano, on the fringe of that Campagna whose past he did so much to disclose.

LANGLEY CHURCH, BUCKS.*

LANGLEY was originally connected with Wyrardisbury, to which place this church was a chapel-of-ease. The church is supposed to have been built by the Kidderminsters, for a long time resident in the parish, and who obtained the manor in 1626. The present structure was probably built in the reign of Edward III., whose arms, the three lions of England, appear in one or two windows, as also the letters "Ed." in a window in the aisle. There are several other fragments of stained-glass, including a very good figure of a saint in the east window of the aisle, and the Jacobean coat-of-arms in stained-glass above it. It would appear as if the chancel was the first to be completed, the decorated work here being much finer and better in design than in the aisle. There are no traces visible of any earlier work, but this is very good of its kind, and the church carving, though repaired in some places, is wonderfully preserved, that on the pillars being particularly good. It will be noticed that whereas the east window of the nave has columns on each side, that of the aisle has none. Again, the windows of the aisle are placed in recesses far inferior and certainly later than those of the chancel. The floor of the chancel was at one time probably much higher, as is shown by the masonry remaining at the bases of the pillars and also by the sedilia. Outside the windows have been "made good" with plaster, which is causing the stone beneath to decay rapidly. There is a rather curious perpendicular window in the south wall of the nave, now blocked up, behind which is the library. The tower appears to be very modern.

The Kidderminster pew or chapel and burying-place was built by Sir John Kidderminster in 1626, as also the library. The books in it are of no great interest, being almost entirely

* A paper by Mr. R. H. Russell, read at the meeting of the Bucks Architectural and Archæological Society.

theological. The paintings on the cupboard doors are very interesting and of considerable merit, and represent scenes in Windsor, Eton and Langley Park. Unfortunately there is no tradition as to who was the artist. There is also a portrait of Sir John Kidderminster on the inside of one of the cupboard doors.

There are a number of monuments and achievements in the church to the families of Kidderminster, Hubert, Swabey and others, besides those in the Kidderminster chapel to the Bateson Harveys. The quarterings of Hubert are very fine. The big monument in the chancel commemorates Edmund Kidderminster ("Unius sex cleric. almæ curiæ cancellar.") and his wife Anna, daughter of John Leigh, of Addington. He died in 1607 ; she 1618. Also John Kidderminster, who died 1558 ; and his wife Elizabeth, who died in 1590. There are also several brasses in the floor to the memory of John Bowsare, gentleman, 1608 ; Elizabeth, daughter of Roger Giffard, 1434 ; John Boteler and wife, Matilda, *circa*, 1440 ; Thomas Bowsare, 1572 ; Julian, wife of Edward Higgins, 1603.

At the time of Doomsday this manor was included with Wyrardisbury. In the reign of Edward I. it had passed into the hands of the Crown, and in 1447 it was conveyed to Eton College. But it again reverted to the Crown, and in 1492 was granted by Henry VII. to Elizabeth, Queen Consort. Henry VIII. granted it to Katherine, Princess of Wales. Again, in 1523, he granted it to Henry Norres, Esq., for a knight's fee. The same king granted it in 1540 to Sir Anthony Drury. Edward VI. granted it to his sister Elizabeth. In 1626 it was granted by patent to Sir John Kidderminster, whose daughter and heiress Elizabeth carried it to Sir John Parsons, of Boveney. Sir John was created a baronet in 1661, and after his decease the property was sold to Edward Seymour in 1669. His son, Henry Seymour, succeeded to him, having been created a baronet, at the age of seven, during his father's life-time. Dying unmarried in 1714, his estates passed to his cousin, Sir Edward Seymour, Bart., whose son, Sir Edward, sold it to Lord Masham. The latter sold it to the Duke of Marlborough, who conveyed it by deed, dated 1788, to Sir Robert Bateson Harvey, grandfather of the present owner.

There are two sets of almshouses to the north and south of the church, built by Sir John Kidderminster and Sir Henry Seymour.

THE YORK GUILDHALL.

IT appears from a paper by Mr. J. S. Rowntree that the York Guildhall was built in the latter part of the reign of Henry VI., being begun in 1446, though it was not finished till after the discovery of America by Columbus. It occupied the site of a previous hall, sometimes called the Common Hall, belonging to the Guild of St. Christopher, in which the Corporation "held their general assemblies and courts of pleas, and celebrated their solemn feasts." The Guild of St. George having been joined to that before-named, it was in November of the 24th year of King Henry VI. that the Mayor and Commonalty agreed with the Master, Brethren and Sisters of the Guild of St. Christopher to build a new hall at their joint expense. The Guild of St. Christopher began its career in York in the reign of Richard II. Like other religious fraternities it was suppressed at the time of the Reformation, and its stipulation with the Corporation to occupy the hall for ten days at the festival of St. James the Apostle, with "reasonable convenience for placing and keeping wine," necessarily fell into abeyance. The architecture of the Guildhall is Perpendicular Gothic. The hall is 93 feet in length, 43 feet in breadth, and 29½ feet in height. The roof of open timber-work is supported by ten octagonal oak columns, each being cut out of a single tree. Tradition says these noble trees grew in the forest of Galtres. Sutton-on-the-Forest is sometimes stated, it is not known on what authority, as the site whence they came. The ceiling displays shields, grotesque figures and curious heads, some of which are said to have been brought from St. Anthony's Hall. It is conjectured by Mr. Davis that the bosses of the ceiling display the trade or heraldic marks of merchants who were donors to the building fund. Thomas Jameson, lord mayor in 1504, and John Dodgso, who filled the office four years later, each gave sundry "waynscotrs" towards the "selying" of the walls, and their marks are probably amongst those which still look down on the crowd beneath them. For more than three hundred years the windows in the Guildhall were only filled with louvre boards admitting air as well as light. In 1760 they were glazed. The plain glass then introduced has undergone replacement by stained-glass, representing events connected with the history of York. Returning for a moment to earlier festivities in this hall, there is a quaint record of one that was celebrated in 1487, before the building was finished. In that year "the Earl of Northumberland presented the Lord Mayor and Corporation with eight bucks and five marks in money, to be disposed of for the solace and recreation of them and the citizens, the Guild of St. Christopher contributed a further sum of 7*l*., and a party of between six and seven hundred assembled in the Guildhall, and had a worshipful recreation, solace and disport, with bread, ale, venison, roast and bakyn, and red wine in abundance, without anything paying for the same." The chapel of the Guild of St. Christopher and the common kitchen which adjoined the common hall, occupied the ground on which the Mansion House now stands. The chapel in the eighteenth century had fallen to the condition of an ale-house, perhaps retaining an allusion to its former ecclesiastical use in its sign of the Cross Keys. One of the Corpus Christi plays was always performed opposite this building which was occupied by the Lady Mayoress and her sisters, as the aldermen's wives were styled, as a good standpoint from which to witness the pageant. The architect of the Mansion House was Richard Boyle, Earl of Burlington, and it was completed in 1726, and the first great feast was given by the Lady Mayoress (Lady Clarke), and was called the Lady's Feast. It was the precursor of a long succession of festivities ; indeed in 1724 the Lord Mayor was required by minute of the Corporation to have two public dining days in every week, the days to be specified at his installation. There was at that time a substantial stipend attached to the office, an arrangement which has long ceased to exist.

EARLY EARTHWORKS.

A PAPER by Mr. Charles Lynam, architect, on "Earthworks of Early Date," was read by him at the meeting of the British Archæological Association at York. He said he proposed to consider examples of earthworks of remote date, which were situated for the most part within the county of Stafford. These earthworks, he said, were for the purpose of succour and defence. There could be no question that they formed a series along a continuous course. They bore internal evidence that they were constructed by the same people, as all their main characteristics were strikingly similar. In any case, their situation was on high ground, from which full command was had of their immediate surroundings, and of very extensive distant prospects. In fact, from each of them a clear panoramic view of vast extent was obtained of the surrounding country. In each one or more sides was immediately bounded by steep natural slopes. Their top was irregular in form, the sides next the slopes taking the form from the upper edges, and the other sides were circular and not rectangular in form. The mode of construction seems to have been as follows :—The site having been carefully selected, with command and defence in view, and the size determined upon, the ground within the prescribed area was used for procuring the necessary materials for the walls by excavation. That material was thrown up into single banks along the lines of the adjacent steep slopes about 6 feet in height. On the other sides, from one to three banks were thrown up with a corresponding number of ditches of varying width and depth, the importance and magnitude of these walls and entrenchments being determined by the nature of the adjoining lands. When they were flat and easily approachable the works of defence were the strongest, but where any natural obstruction to the approach existed by slopes or otherwise the works of defence were reduced to a minimum, but what they always afforded was an internal area of from about three acres to about ten acres in extent. Enclosed within was a raised bank, outside of which was either a steep natural slope to the hills or raised mounds and sunk ditches, giving to those within the enclosure a security from surprise, and a very formidable defence against an invading foe. Mr. Lynam then gave descriptions of various earthworks and camps, including those at Bury Walls, Billington, Berth Hills, Kinnir Edge, Chesterton, and, in conclusion, said it would be seen that the county of Stafford was not merely to be dubbed a black country, covered only with collieries, ironworks and potteries, but that amongst other interesting archæological possessions it held within a very short compass works of the Roman invader and of our Saxon forefathers well deserving of attention, and capable of exciting the liveliest interest of anyone given to early archæology.

In reply to questions, Mr. Lynam said that there was no appearance of there having been any breastwork whatever on the banks, which were formed to a considerable extent of rubble stone, evidently dug out of the sites, and mixed with boulders from the immediate neighbourhood.

The Chairman, the Rev. Canon Raine, said that with regard to Mr. Lynam's paper, he would respectfully suggest that he had underdated the age of those camps. It appeared to him that they dated back hundreds of years before there was a Roman in this country. The hillsides in our own country were scored with those mounds, especially on the Wolds. He attributed them to the division of the country into small tribes, which were obliged to be continually on their defence. Those mounds were to some extent fortifications, and also places into which the cattle belonging to the tribe could be driven for security. He did not think they had regular stone walls. As

Mr. Lynam said, the rubble was in the main what was gathered from the diggings inside; they erected palisades where they could make them. He could not agree that those mounds were ever reared by Saxons or Romans or used by them. They could not find anything Roman or Saxon in them except it was something dropped by a wayfarer. If they found anything it was flint implements used by a very ancient people indeed.

THE KING'S MANOR, YORK.

THE ancient buildings known as the King's Manor, and now utilised as a school for the blind, were visited by the members of the British Archæological Association. Mr. A. Buckle, the superintendent, conducted them through the various courts and apartments and pointed out the various architectural and historical features of the building. Mr. Buckle has written a history of the manor, and the members were indebted to him for a very interesting paper on the same subject. In it Mr. Buckle stated that the palace of the Tudor and Stuart monarchs was originally the palace of the mitred abbot of St. Mary's—Abbot Sever or Sevyer, who died in 1502, and was the last who was supposed to have done anything to the building. Very little of his work now remained. When, in 1538, the abbey of St. Mary's was suppressed, the abbot's house was retained by the Crown, and remained in the possession of the Crown until purchased in 1838 by its present owners, the trustees of the Blind School. About the year 1538 the Council for the North was formed, and the King's Manor was, for the period with which he dealt, the official residence of the Lord-President and Council. There are still in existence three or four walls, or pieces of walls, which, according to the view of competent authorities, probably belonged to the time when the Council of the North was holding its sittings, whilst the handrail of the stone staircase on the south-west side of the building is doubtless *in situ* as in Abbot Sever's time. Recalling a visit paid to the palace by Henry VIII. and Queen Catherine in September 1541, Mr. Buckle said that it was in June of that year that the congregation of York were informed of the intended visit, and they agreed that "20*l.* should be laid out at London for the purchase of two cups of gold and silver of the best fashion to be presented to the King and Queen." Platforms were erected at Micklegate Bar, and on the 12th, "My Lord Mayor called certain joyners and painters and commanded immediately to take their counsel and devices together to make a show at Mickeleth Bar." It was resolved that a cup of gold, with 100*l.*, be presented to the King, and another cup, with 40*l.* therein, to the Queen's Grace for the worship of the city. The King, with twelve members of his Council and retinue, remained in York from September 15 to 26 waiting for the King of Scots, but no King came from the North to greet his uncle. Henry's Queen left him at York and went on to Pontefract Castle, and thence to London, where, when Henry arrived, a charge was brought against her which cost the poor Queen her head. One measure of the King's which dated from York all archæologists will regret. Many of the beautiful shrines in the churches of the north still remain undefaced, with their minute sculpture and fine goldsmith's work, creations of the highest artistic skill of the Middle Ages. On September 22 the King issued his commands to the archbishop to cause all these shrines in York to be taken down, and the places where they stood to be made even and plain. Thomas Radcliffe, the Earl of Sussex, was the first Lord President who expended anything on the repair of the Manor House. His successor, Henry Hastings, Earl of Huntingdon, made important additions to the palace, the greater part of the north-west portion being doubtless erected at this time. In one of the largest rooms are heraldic achievements connected with the earl. He seemed to have been in good favour with the citizens, for he preferred a request to the Corporation that North's postern might be enlarged so that his great horse might go through, with which request the Corporation at once complied. When James I. came to England to assume his crown he was received at the manor by the famous Thomas Cecil, Lord Burleigh, then Lord President. In 1616 a grant of 1,000*l.* was made by the Treasury for repairs to the manor, but in 1624 Lord Sheffield, who had succeeded to the Lord Presidency, rendered an account showing his expenditure to have been no less than 3,301*l.* 4*s.*, the greater part of which was doubtless spent in the erection of the block at the north side of the house. The latter is Jacobean in character, and the initials of King James are placed on the pilasters at the entrance. Lord Sheffield, too, seems to have been a favourite with the citizens. It was customary to present annually a butt of Gascoigne wine to the Lord President, and gifts were also sent to Lady Sheffield. These included two loaves of superfine sugar, weighing 12 lb. 14 oz., at 23*d.* per pound; thirty other loaves of ditto at the same price; a March payne, 13*s.* 4*d.*; 6 lbs. of comfits, 10*s.* 6*d.*; two boxes of marmalade, 5*s.*; Mayne bread, 2*s.* 6*d.*; one peck of pears, 2*s.*—total, 5*l.* 4*s.* 1*d.* On August 9, 1615, it was agreed "that the Lord Mayor, aldermen, sheriffs, twenty-four chamberlains and best commoners should meet the Lord Sheffield, Lord-Lieutenant and President in the north parts at Walmgate Bar to welcome his Honour to the city, who hath been to London, and since his last being at this city within the year had all his three sons drowned and daughter deceased." Coming to the most famous of the Lord Presidents, and to the most glorious part of the King's Manor, Mr. Buckle mentioned that Thomas Viscount Wentworth, the noted Earl of Strafford, was appointed Lord President in 1628, and for a great part of the first four years of his presidency resided at the King's Manor. The house owed the erection of the western and north-western part of the quadrangle to the ill-fated Strafford. His arms over the west door were those he bore as Viscount Wentworth, and were said to have formed one of the articles of his impeachment, in that he showed his ambition by quartering his arms over a royal palace. This interesting monument of one of the greatest men of that century is externally pretty much as he left it. Strafford's presidency lasted from 1628 to 1640, years during which he attained to the zenith of his power and honour, ending—after he had been hunted down by the relentless hatred of his political foes, and deserted by the master he had served so well—in the gloom of his execution. York had good reason to be thankful for a Lord President of such remarkable vigour of character, for it was during his presidency in 1631 that York suffered from the last visitation of the seventeenth-century plague, and by the prudent and strict regulations issued by Strafford, the Lord Mayor was much helped in his government at a trying time. The citizens of York, according to Mr. Davis, were fully sensible of their obligations to the Lord President. Towards the end of October, a short time before his departure from York, upon having received the appointment of Lord Deputy of Ireland, the Lord Mayor and his brethren were desirous of personally waiting upon Lord Wentworth to give him thanks for the many kindnesses he had shown the city. And they sent the sword-bearer to the manor to inquire when his lordship would be ready to receive them. It is not recorded that the interview took place, and most probably the compliment was declined. Not many days previously this remarkable man had been plunged into the deepest distress by the premature and sudden death of his wife, the Lady Arabella Wentworth, to whom he was devotedly attached. He remained in York but a short time after this event. It was during the presidency of Strafford, said Mr. Buckle, that the manor was used more as a palace than at any other time. In 1639 and 1640—which saw the gay and picturesque Court of Charles within its walls—the building, much as it was now externally, had, the reader of the paper thinks, reached the zenith of its glory as the palace of the Crown. Its fall and desuetude seemed to have been as rapid and as complete as the fall of the last President who lived within its walls, for in 1641 he laid his head on the block for his master. And in the same year that master, on his way to the north, spent two nights in York, not, however, as its palace, but at the house of Sir Arthur Ingham, and in 1642, during his long and last visit, he was indebted to the same worthy old knight for shelter and entertainment. The Council now being abolished, we found that in 1643 a Mr. John Stainforth was appointed "keeper of the house within the site of the late Monastery of the Blessed Mary, near the walls of the city of York, otherwise called the Pallas, or Manor House, or the Mannor Place, with a salary of 6*l.* 13*s.* 4*d.*" Verily, said Mr. Buckle, might we not write over the entrance, "Ichabod"—"The glory hath departed?" But 200 years afterwards (in 1838) we might pull down the inscription, for the Manor House once more became worthy of a palace, and again had a glory, not indeed derived from the presence of any monarch, however noble; another glory, but not less real—the memory of a famous Yorkshireman, William Wilberforce, by throwing light on the mental eyes of those who see not—

> The waving corn in autumn days,
> Nor witchery of the moon's pale rays,
> Nor morn's glad beams of rising sun,
> Nor roseate hues when day is done,

yet could find joy and gladness in the mental vision of beauties unseen by any physical eyes.

KILMALLOCK.

A CORRESPONDENT of the *Irish Times* gives the following account of the ancient town of Kilmallock, which was lately visited by the Royal Society of Antiquaries of Ireland:—

The town stands in the midst of the fertile plain on the road between Limerick and Cork. Though sixty years ago it exhibited, says a traveller, "the stillness of a sacked and desolate city," it is now a thriving and prosperous town, and evidently doing a good local trade, and the hotels were able to afford an excellent luncheon to the large party of archæologists that invaded

them so peacefully. The plan of the town was nearly cruciform, exhibiting two streets intersecting at right angles, the river Cammogue flowing past the end of one or two great picturesque ecclesiastical ruins standing on the banks of the stream. The town was anciently walled, with four castellated gateways at the entrance of the streets, and these are to some extent intact. These were strongly fortified, bearing some resemblance to Spanish architecture. The ruins are in far less good condition than at the beginning of the century, as they have been largely used as quarries for building purposes. Croker, in his day, said that "whenever a hovel is required to be built, the materials are procured by breaking down part of these once splendid mansions, some of which have been lowered and fitted up in accordance with the neglect and desertion of the place, and the interior of others is occupied by sheds for cattle or more loathsome pig-styes." Very few of the strong and massive mansions of the old burghers of Kilmallock now remain in comparative preservation. These were built of hewn stone on a uniform plan three storeys high, with embattlements and fine stone mouldings. The windows, mullions and chimneypieces were all finely carved in limestone, many of which exhibited great delicacy of finish and detail. They presented generally two or more gable ends to the street, the entrance being by fine semicircular arched portals, opening into small halls communicating with broad passages. One of the castellated mansions is said to have belonged to the Earl of Buckingham, and another where Sarsfield once resided. One with a wide, projecting roof was an ancient mint, and in modern times became the police barrack.

The castle stands within the town, and as the passage through it was too narrow the roadway has been diverted to the east. It is rectangular in form, 60 feet in height, and ascended by 73 steps. The guardroom is a blacksmith's forge, the room above being occupied, and the whole place is grim, sooty and dirty. A fine view, however, is obtained from the battlements. For this unsanitary abode a small weekly rent is exacted.

The wall runs almost without interruption the whole length of the south side of the town, and part of the east wall also remains. A monastery was said to have been founded here in the seventh century. The older of the ruins already mentioned belonged to the abbey dedicated to SS. Peter and Paul. It consists of a choir, a nave, a south transept, and side aisles and circular tower 50 feet high, with walls 5 feet thick. The choir is roofed and used as a parish church. The nave is divided by a range of four pointed arches, which spring from columns of plain masonwork. There are several sculptured monuments belonging to the Fitzgerald, Verdon and Blake families. The belfry rises to some height above the church, and is perforated by several pointed windows. The Dominican Abbey, on the opposite side of the river, and outside the town walls, is said to have been founded in 1291 by Gilbert, second son of John, Lord of Offaly. It is larger than the abbey church. The plan is cruciform, and the architecture is graceful and picturesque. It exhibits many specimens of exquisite design, equal to that of any other similar structure in Ireland. It presents a most striking view from the road—the soft grey walls toned by age, and crumbling through neglect and the touch of sacrilegious hands, the graceful, but ruined tower, the finely-moulded windows and the rich expanse of meadow stretching far beyond. The chancel is considered the earliest portion of the abbey. The east window is very beautiful, and has been restored by the Society, and consists of five lancets under a pointed arch. The south wall has six double lancets opening very widely inward. Underneath are the remains of sedilia, and on the opposite wall is a remarkable tomb-niche, finely carved with delicate pointed arch. It is suggested that Maurice, son of the founder and hero of Hallidon Hill, was buried here with his wife. Near at hand, on the floor of the abbey, is the tomb of the White Knight. His treachery to his kinsman, the Sugan Earl, son of the last Earl of Desmond, is well known. He secured his estates by submission to Elizabeth, and on the offer of 1,000*l.*, with pressure put on him for the Sugan Earl, he set out and captured him near Mitchelstown by treachery, and sent him to Cork, from whence he was sent to the Tower of London, where he died in 1608, and his betrayer died in the following year.

North of the chancel is a great hall, 90 feet by 18, likely the common-room of the community, and to the west is the refectory. The remains of a passage or chambers lie north of the cloister garth, and traces of cloisters on the east and south. The central tower is 90 feet high, resting on four lofty arches, one leading to a transept, with a fine window of five lights, with a beautiful series of geometrical pattern. It is built up to half height to preserve it. In a small chamber in the north side of the cloister garth is a "squint" about 8 feet long, through which a watcher saw that the altar lights were lit, or perhaps a sick brother to look towards it and hear service. The whole is in great want of preservation. The Society has spent 80*l.* in restoration, for the privilege of which they had to fee the owner. The ground is held under judicial lease, and the condition of the floors and immediate surroundings was exceedingly neglected and filthy. The floors were ankle deep in cow manure, the animals using the abbey as a shelter, and one of the beautiful small windows was recently broken down to rescue a calf that had thrust himself in. Much comment was passed on the neglected condition of the abbey, and the question pertinently asked, What are the societies in the kingdom to do in order to secure a measure that will put these splendid ruins and hundreds of others beyond the power of destruction by man or beast? Recognising to the fullest extent the rights of property, no one can defend the rights of owner or lessee to destroy and deface ancient monuments. This principle is recognised in Sir John Lubbock's Bill, but the measure, unfortunately, is a dead letter. What has been seen during the excursion has forced upon us the absolute necessity of such a measure as will preserve to us the stone treasures of ancient days by the protecting and sustaining powers of the State.

At the dissolution of the monasteries the Abbey was granted to the Corporation of Kilmallock, after which it gradually sank into ruin, until it is now, as Mr. Aubrey de Vere said of it, "the charnel of your desecrated fane." The town of Kilmallock is one of the most ancient of Ireland, being a walled town in the thirteenth century, and the Corporation dates from an early period. The charter, however, dates only from the 27th of Elizabeth. The Corporation consisted of a sovereign and burgesses. The property was at one time very extensive, but drifted into the hands of private individuals. It returned two members to Parliament before the Union, when it was disfranchised, and Oliver Gascoigne received 15,000*l.* compensation. The town was associated with many stirring events in the wars of the Earls of Desmond. It was practically refounded by the Fitzgeralds, and was long the chief scene of their power and splendour. Their possessions extended over nearly four counties of an area of over 570,000 acres, and hence the seat of their opulence must have been a place of great importance.

When Garret, the last Earl, was arrested and sent to London, his cousin, James Fitzmaurice, captured Kilmallock, and the "Annals of the Four Masters" tell how the town was taken and sacked, and three days occupied in pillaging, taking away vast treasures of goods, after which they set fire to the town, "so that Kilmallock became the receptacle and abode of wolves." It was rebuilt by Sir John Perrot, and soon Fitzmaurice was captured, and in the church of St. Peter and St. Paul the president of Munster, with sword to his breast, compelled him to swear allegiance to Elizabeth, and confess that "this earth of Kilmallock, which town I have most traitorously sacked and burnt, I kiss, and on the same lie prostrate, overfraught with sorrow." It was in that church that the Sugan Earl attended service, when, after being received with enthusiasm and joy the day previously, he "was mocked, cursed and spit upon" by the people, as the service conducted then was Protestant. The town figured in the Civil Wars of 1641 and suffered much, and from that date down its ancient walls, abbeys and buildings have crumbled into ruins, so that it may well be called "the Baalbec of Ireland."

It is worthy of note regarding the origin of White Knight, that on the field of Hallidon Hill three cousins of Desmond fought so well for Edward III., that after the battle he bound up the arm of one with a white scarf and knighted him on the field, and also the others, calling them Black Knight, Green Knight, and White Knight on account of their armour. The title of White Knight is extinct, but the Black Knight is represented by the Knight of Glin, and the Green by the Knight of Kerry.

ROSLIN CHAPEL.

ONE of the excursions in connection with the meeting of the Royal Archæological Institute of Edinburgh was to Roslin. Mr. Thomas Ross, architect, was the guide for the day, and the party visited first the chapel—the Collegiate Church of St. Matthew as it properly is—where Mr. Ross delivered a short lecture upon its leading features. Founded in the middle of the fifteenth century, the chapel was the pious work of the Earl of Orkney of the day, who built it "to the end he might not seem altogither unthankfull to God for the benefites he receaved from Him." He never lived, however, to see the end of his work. Only the choir was completed, and that after the founder's death. One can only guess what the completed edifice might have been from the beauty of what has come down to us. It should be unnecessary, even if it were possible, to describe this gem of architecture. The chapel, reckoned in the money value of our day, cost four hundred thousand pounds. When one remembers the way in which the chapel was built, that these were not the days of competitive plans or contract jobs, and that the pious builder "caused artificers to be brought from other regions and foreign kingdoms, and caused daily to be abundance of workmen of all kinds present;" and when one looks at the wonderful richness of the interior, which is encrusted with the most elaborate carving, it is easy to imagine that it may have cost a fabulous

amount. In the accounts for the chapel there appeared large sums for wood, whereas in the building itself there is not a scrap of wood except what has been recently introduced. The explanation was that William Lord Sinclair worked without plan, and that when a workman brought him a design, he was asked to furnish a full model of it in wood. What Mr. Ross principally confined his attention to was the peculiarities of architecture which distinguish the building. He drew attention to features of the design which reminded one of Glasgow Cathedral, and which were so marked that they could not be accidental. He expressed the view that the foundations of the nave had been laid, extending as far as 91 feet to the westward. He emphasised the peculiarity of the barrel roof of the choir, and he thought it might be doubted if it was the original intention to have that vault only, as all the collegiate churches known had a thick roof. The flying buttresses outside would also have led one to expect a groined roof. The explanation seemed to be this. There were two periods of church building in Scotland, separated by more than a century. The first, beginning about 1057 A.D., lasted two centuries. During that period Scottish architecture followed that of England. The second period, to which Roslin belonged, began in the fifteenth century and continued till the Reformation. During the interval between the periods Scottish builders were principally engaged in erecting castles of a modified Norman type, and they might be said to have lost touch with Gothic architecture. When they came to take it up again, it was not surprising to find many features common in the castles, such as the barrel vault, introduced in the chapels. Mr. Ross also drew attention to another feature of the chapel which he ascribed to this cause, namely, the vaulting of the north and south aisles. These vaults sprung from stone lintels laid across the aisles from the outside wall to the top of the pillars in the nave arcade, and this, Mr. Ross said, was a style which was not to be expected. It was not to be expected that the builders of Roslin were unacquainted with the groined roof, but they were simply following the examples of their own day. After Mr. Ross's explanation the party spent a good deal of time in examining the details of the chapel, and the incumbent, the Rev. Mr. Thomson, gave useful assistance in explaining the subjects of the carvings upon the pillars and upon the walls. One feature which struck and delighted many of the visitors was the wonderful richness of the colouring which age has given to the chapel, both within and without.

VALUES IN PAINTING.

WHEN an artist desires to imitate a scene containing unequally-distributed masses of light and shade, he is obliged to attribute to each of them its real value. He must therefore measure, or at least estimate, the brilliancy of different objects or of different surfaces, and graduate them in his copy according to the same proportional scale as in the model. For this purpose he possesses an eye more or less exercised, which, however, as in other men, is a powerless instrument for the exact comparison of luminous intensities. He is, moreover, obstructed by the imperfection of resources of the art of painting; for nature generally presents an absolute brilliancy that no colouring could imitate. Unable to make his picture as perfect as nature, he is forced to darken it; but, for accuracy, he should at least maintain harmony and proportion of lights—that is to say, weaken all the lights in the same proportion. On this condition alone will his representation be true and faithful. How far has this condition been fulfilled in the most celebrated pictures?—in other words, how far are the masterpieces of art true to nature? More fortunate than the painter, the optician, knowing the imperfections of the eye, has invented photometrical apparatus, by which he can compare the brilliancy of neighbouring objects and numerically express their relative illumination. By the aid of such apparatus, for instance, he ascertains that the shadow of a stick cast upon white paper has a twentieth of the brilliancy of the portions directly illuminated by the sun. One of these instruments is like a single-barrelled opera-glass. By putting the eye at the front we see that its interior is divided by a partition. On looking at an object through one of the compartments a neighbouring object can be seen through the other; and by turning the tube upon itself, the partition may be made to coincide with the line of separation of the two objects. Close to the eye the instrument carries a movable graduated circle. If, continuing to regard the two objects, we turn this circle, we remark that one becomes more distinct, while the other darkens. Soon the darker object becomes extremely black, while the other attains its maximum brilliancy. The graduation of the circle is so arranged as to show the difference in brilliancy of the two objects by the number of divisions which this circle has to be turned from the zero (found as above) until the objects appear in the field of view with an equal degree of brilliancy. To understand this better, conceive the shadow of a house cast on a white wall. Let us direct the telescope on the boundary line of the shadow; we see in one compartment the brilliant surface and in the other the shadow. Let us now turn the circle until the two parts acquire the same brilliancy, or until we see an equally illuminated surface. The divisions in the circle will then show that the mark which stood at zero at the commencement of our experiment has moved to 20, showing that the illuminated part of the wall is twenty times more brilliant than the shaded portion. Had the wall been yellow, blue or any other colour, we should have found the same result. Instead of the wall and the shadow of the house, we might consider the ground and the shadow of a tree, a sunbeam and a shadow cast anywhere, the lines of separation of light and shade in a landscape, of a building and the sky, of blue sky and a cloud, &c.—in every case we would have obtained numbers expressing the relative brilliancy of objects contiguous to the field of vision, provided always that the photometer be suitably modified not only according to the brilliancy, but the tints or colourings of the contiguous objects. Let us now suppose an artist to have reproduced in a landscape a wall with a shadow, a piece of ground with the shadow of a tree, &c., and let us try to investigate the truth of his representation. The operations are precisely similar to those already described when examining the relations of the objects themselves. M. Jamin, the inventor, states that after having submitted to the test of his photometer a great number of pictures, he has arrived at the unforeseen result that in almost all the proportional relations of the lights differ from those of nature. Always, or almost always, the shadows are not sufficiently deep; light and shade in pictures have also different colouring, so that the photometer, such as described, cannot, as in nature, render the apparent brilliancies of objects exactly equal. A twofold incorrectness is thus everywhere indicated, incorrect proportions of light, false imitations of tints. Had these deviations from nature been trifling painting might be admitted to be an approximate imitation of nature, but they are on the contrary very considerable. In the simple case of a body illuminated by the sun and a shadow cast upon it, the relations found in summer, winter, different hours of the day, fine and bad weather, have been extremely varied. In general the minimum value of the relation of light and shadow is 10, its maximum value 20. But when sunbeams in pictures are examined we find the above relations comprised between 2 and 4, so that the brilliancy of the sunlight is incomparably weaker in the pictures than in the true landscapes. It is difficult to conceive how the eye can tolerate such considerable inaccuracies. Still all landscape-painters do not deserve this reproach in the same degree; the modern school has made great progress towards exactness; everyone may remark that their pictures have deeper shadows and brighter lights; some pictures of Decamps, for instance, present luminous effects comprised within the limits assigned by nature. The discordance between nature and art in night pictures is not less remarkable. If in one of these pictures, usually lighted by a murky lamp, we compare the light of the lamp with the best illuminated parts we shall find a relation comprised between 20 and 30. By placing in a room a lighted candle and a sheet of white paper, the ratio of the light of the candle to that reflected from the paper will be found to be 1,500; the candle flame is thus 1,500 times as luminous as the paper, while in a picture it is made scarcely 30 times as luminous.

GENERAL.

Mr. W. H. Smith, the Lord Warden of the Cinque Ports, has accepted the office of President of Dover College, and of the Dover School of Art, posts which were held by the late Lord Granville.

Mr. J. O. Moynan, C.E., has been transferred from the County Longford, and appointed county surveyor for the North Riding of Tipperary, in place of the late Mr. A. H. Crawford, C.E.

Herr Carl Hilgers, the sculptor, who sent in one of the models for a National Monument to the late Emperor William of Germany, has been awarded a prize of 12,000 marks, in addition to the 4,000 marks assured to each of the competitors.

Appeals for the preservation of the tower of St. Mary's Church, Manchester, continue to be made, but the authorities are bent on removing it.

The Electric Lamps at the Frankfort Exhibition were lighted on Tuesday for the first time by the current transmitted from the generating centre at the Lauffin Falls, on the Neckar, 108 miles distant.

A Sum of 20,565*l.* has been derived from the Glasgow East End Industrial Exhibition. The expenses amounted to 17,000*l.*, and the balance has mainly been invested in city stock.

The Local Board of East Dereham have instructed their surveyor to prepare plans for the construction of a new cattle market.

The Architect.

THE WEEK.

AT the meeting of the Manchester City Council on Wednesday, a memorial was read from the local Society of Architects, appealing for a postponement of the demolition of the tower of St. Mary's Church. It was said by the memorialists that "Although the tower itself is not possessed of much architectural beauty, yet it presents features of archæological interest, particularly in the curious combination of Gothic remains, possibly from some earlier building, with masonry of a later style. As a memorial of the past and a vantage-point for the prospect from its summit, it might, we venture to think, be allowed to stand. We would, at all events, strongly recommend that it remain untouched for, say, twelve months, when the question of facing up the east end and putting the whole in repair could then be entertained." The Mayor, in order to test the feeling of the Council, suggested that the Parks Committee should reconsider the subject. He declared that it was a mistake to have removed St. Mary's Church instead of St. Ann's Church, which would have allowed of the extension of the square. Alderman THOMPSON said the committee had visited the place on three occasions, and each time they concluded it was not worth preservation. The majority of the Council took the same view, and the efforts to save the tower were consequently ineffectual.

IT is understood that the sum of 120,000*l.* will be put down in the instructions to competitors as the limit of outlay for the construction of the proposed Art and Music Galleries which are to be erected in Kelvingrove Park, Glasgow. The buildings are to comprise a central hall, with an area of from 8,000 to 10,000 square feet, exhibition galleries, lecture theatre, museum, workshop and offices. The designs are to be sent in on a day to be named in November, and after examination there will be a second competition among the authors of the designs that appear most eligible. The site is excellent—a public park, with undulating grounds. Sir GILBERT SCOTT'S University buildings form part of the boundary on one side, and will be opposite the new building. The competition ought to bring forth many excellent designs.

STRIKES in France have to be brought to a victorious end without much delay, for "the sinews of war" are not very strong in the societies, and therefore the campaign must be brief. The excavators have discovered that they cannot hold out as easily as their English models, for their supplies are over modest. In twenty-three days all that could be distributed among the three thousand men on strike was a sum of 4,665 francs, which is far less than a penny a day. The average pay of excavators is 5 francs a day, so that the men on strike lost in twenty-three days 345,000 francs. It is a large price to pay for the luxury of annoying contractors, the majority of whom can bear a loss with equanimity.

A REMARKABLE paper was read by the versatile Mr. G. C. LELAND at the Congress of Orientalists on Wednesday. He is a student who follows some of the untrodden byways of archæology, and one of his discoveries does seem to be connected with some early forms of ornamentation. According to Mr. LELAND, a curious link connecting the East and West is to be found in the salagrama stone, which is to be found in India. It is about the size of an orange, and is a kind of ammonite having a hole in it. VISHNU the Preserver once, when pursued by SIVA the Destroyer, prayed to MAYA (illusion or glamour) to protect him. She changed him into a stone, through which the destroyer, as a worm, wound his way. Since that time this stone is worshipped. Mr. LELAND found that in the Toscana Romana, a district in Northern Italy, there are families of wizards among whom a vast amount of old Etruscan-Roman lore is preserved. Among other objects they worship or hold in great veneration a stone called salagrana. It is really stalagmite from caverns, but as it resembles the little mounds made by earthworms, the peasants believe it is really the same petrified. This faith that worms have made and passed through it, closely connects the salagrana with the salagrama. In the Norse mythology, ODIN as a worm once bored his way through a stone in order to get at "the mead of poetry." Hence all stones with holes in them are known as Odin stones, also as "holy stones," and are much used in the north as amulets. Hung at the bed's head they drive away nightmare. There seems here to be some connection with the salagrama. Mr. LELAND regarded it as possible that the interlace of Gothic decoration, but especially that of Celtic, Anglo-Saxon and Scandinavian art, was anciently made to avert the evil eye and bad luck. A recent traveller in Persia was told that the patterns on carpets in that country were made intricate so that the evil eye might be bewildered. Mr. LELAND said he had copied many hundreds, if not thousands, of Norse interlaces, and was persuaded that through them all ran this inspiration of a protecting power against sorcery. But Mr. LELAND'S theory is open to the objection that if interlaced ornament was so closely and openly associated with Pagan superstitions, why was it adopted by the early Christians in the West of Europe?

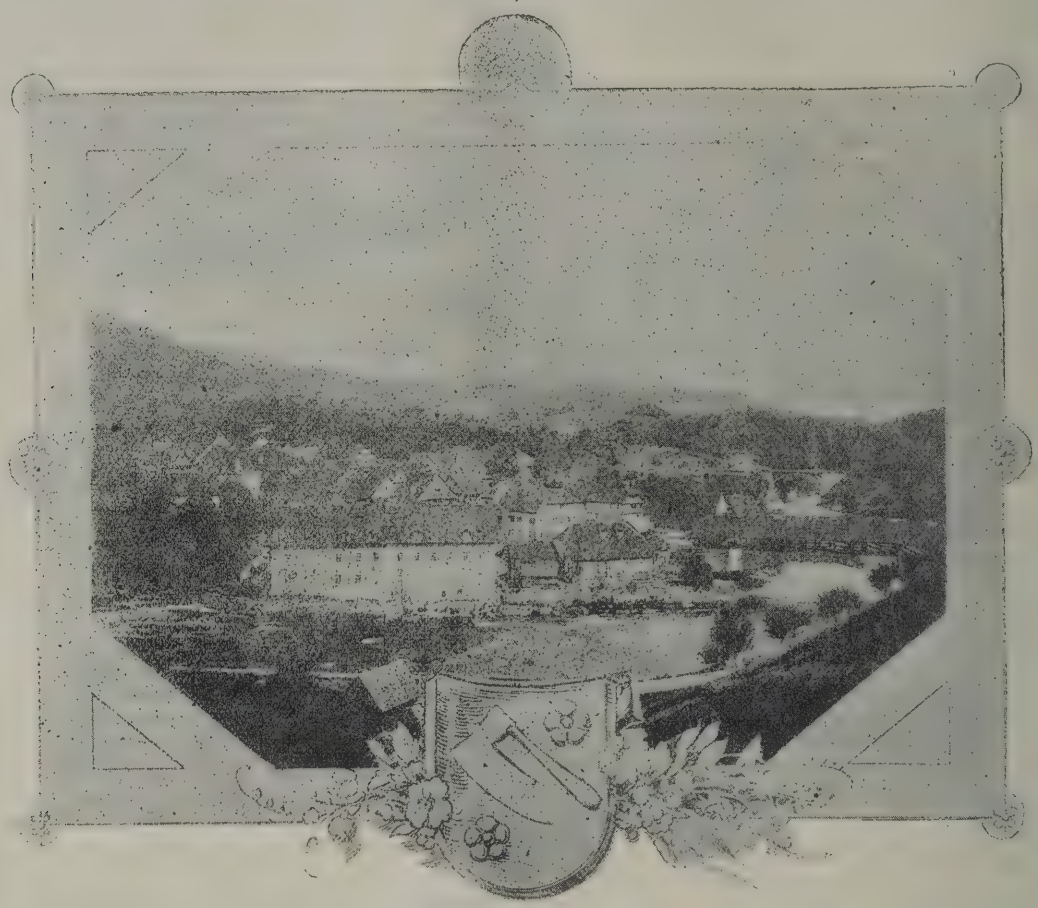
THE Birmingham Council having taken over the technical classes of the Midland Institute, the arrangements are completed for carrying them on in the way that will be most advantageous to the city. The classes will commence on the 14th inst. and will end on April 30, 1892. There are twenty-six teachers, some of them being experts. Care has been taken to make the instruction applicable to the principal industries of Birmingham. Hence most prominence has been given to the metal trades. The metallurgical laboratory is the largest in the country, having eighteen wind furnaces and seventeen muffle furnaces. Electric light is used. There are also a chemical laboratory, a physics laboratory an engineering laboratory, and one for electro-metallurgy; they are all enriched by the latest appliances. The classes will be of two kinds, elementary and advanced. Care has been taken in the grouping so that several connected courses can be attended by students of a trade. The fees can be described as nominal. For a single class the charge will be 2*s.* 6*d.*, or 5*s.* for a session, and a connected course can be gone through for 10*s.* per session. A charge of 2*s.* 6*d.* is made for the use of apparatus. Birmingham has suffered grievously through the influence of the Science and Art Department. The citizens are now endeavouring to recover the trade which was lost owing to the meddling of officials that were amateurs. As one means, industrial design is being properly taught throughout the city, and as a like energy will be displayed in the municipal technical schools they are sure to be no less successful.

OF late years catalogues of private collections have appeared which are among the most prized volumes of collectors. But one which is being prepared by MM. EMILE PICOT and GERMAIN BAPST for the Duc D'AUMALE is likely to surpass all its predecessors. The collections belonging to the Prince in the Château de Chantilly, and which are to become the property of the French Academy, are of the highest importance. The objects were not brought together, as is often the case, as evidence of wealth. Those which were not inherited were obtained by the Duc D'AUMALE because of his love of art and literature. They represent the researches which have solaced long years of exile and suffering. The books have great interest from their rarity or from their association with historic celebrities. The works of art will make the galleries be sought out by many a student. Pictures by Italian, Dutch, Spanish, French and English masters are to be seen there, and each is a masterpiece. Then there are examples of sculpture, furniture, metalwork, tapestry, stained-glass, armour, jewellery, porcelain. Among the numerous collections there is not one object which is not worth an illustration, and it would require a fortune to prepare a description worthy of so unique a treasure-house. The value of the estate is said to be eighty millions of francs, and it is a princely gift to France. When a mortgage is paid off, which will be in 1934, the Academy will be able to derive a revenue of 600,000 francs out of Chantilly.

ARCHITECTURAL PROGRESS IN THE BLACK FOREST.

By J. RUSSELL ENDEAN.

A FEW weeks ago we made some excursions in the Black Forest of Germany; and he who loves to see Nature in some of her most beautiful aspects will find few parts of Europe where he can more completely enjoy himself than here, where rocks and hills, mountains, woods and rivers are presented to his view in all their manifold varieties of form and tint, and light and shade, where are the pine forests in which numberless pine-trees rise straight upwards from their roots to a height of from 150 feet to 200 feet, with many examples of other kinds of trees measuring 6 feet and more in diameter. The course of our wanderings led us to Forbach, distant about twelve miles from Baden-Baden, with a distinctly rural population of about 1,400 persons, and situated in the heart of this part of the Black Forest.



VIEW OF FORBACH.

And here interest was at once excited, for every household seemed actively occupied, indoors or out, in decorating the town. Very beautiful triumphal arches were raised at various points of vantage, whilst in the streets and running for about two miles outside of the town fir-trees were planted, about 6 feet apart, on both sides of the roadway. Flags, banners, and floral decorations were abundant, and far more highly educated populations might here have taken lessons with advantage in the art of municipal festive decorations.

And all this popular enthusiasm was raised on account of the opening of the new parish church, which was all but complete, and the people were fully justified in the spirit they exhibited. We have seen numberless churches in most of the states of Europe, but seldom have we looked upon one that, for general beauty of design, for fineness of proportions, for bold but most chaste decorative effects in tone and tint, made a deeper impression than this charming building, the new Roman Catholic church at Forbach, in the Murgthal.

It was commenced in 1886, and has been over four years in building. It was designed by Herr ADOLF WILLIARD, the consulting architect to the Archiepiscopal Buildings' Administration, Carlsruhe, and has been completed under his immediate superintendence. It is in the style of the Rhenish-Romanesque transition period of the thirteenth century, is basilican in form, with an aisle on each side of the central nave, a chancel with side aisles, an entrance vestibule in three sections flanked by two towers, and the whole is built of sandstone blocks, the blocks having been found lying scattered in the surrounding mountain forests. Standing on a very commanding position overlooking the town, the church is confronted at a little distance by lofty mountains, and from the terrace in front of it an extensive panorama lies before the visitor. For ages past a church has stood on the site of the new building; the late church was built in 1788, but eventually it became too small for the necessities of the population.



EXTERIOR OF CHURCH.

The sacristy (chapel-like) is built at the back of the apse. The total length of the church is 180 feet by 70 feet 6 inches wide at the nave; 80 feet 6 inches is its greatest width. The height externally to the top of the roof is

87 feet, and the height of the towers to the floral cross 167 feet 6 inches. The interior is divided into a broad central aisle 54 feet wide, flanked by two narrow corridor-like side-aisles each 7 feet wide. In the nave, seats are provided for 800 persons, the aisles being without seats.



VIEW SHOWING SACRISTY.

The organ-loft is placed over the vestibule above the principal entrance. In the nave there are seven arches of 17 feet span; from the pavement to apex of the vault, these rise to 60 feet in the centre aisle, and to 24 feet 2 inches in the side aisles; the triforia galleries above the latter are

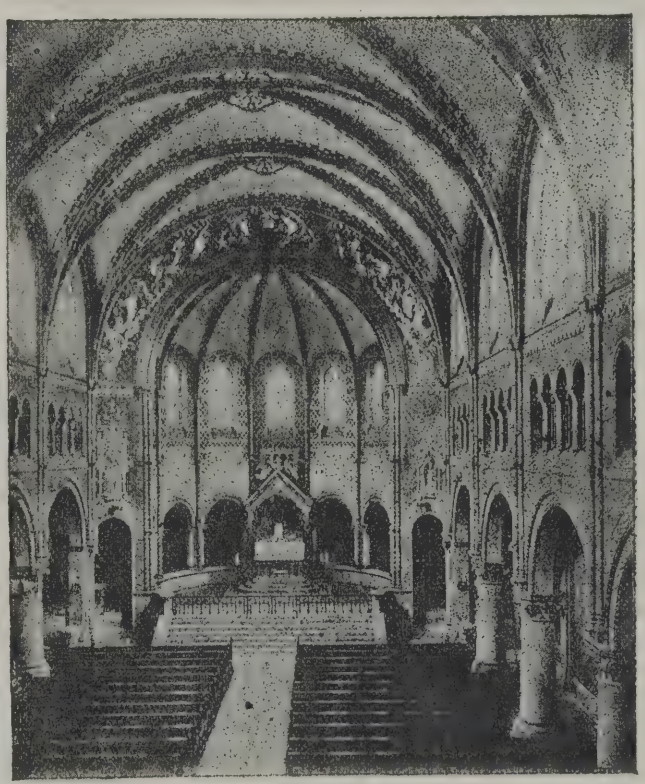


INTERIOR, SHOWING ORGAN LOFT.

open to the middle aisles through a series of four arches on each side, and these are supported by pillars and dwarf columns; as they are lighted only indirectly from the nave they stand out dark against the bright walls of the centre aisle, and the effect thereby produced is most agreeable.

The galleries seat about 300 persons. By means of arches within them the lateral pressure of the roof of the nave is transferred to the buttresses. The organ-gallery, with the principal entrance underneath it, and the doors, are architecturally rich in detail; there are two side-niches for the "confessionals"; over these are the chambers for the use of the bell-ringers during the service, whilst over these again, and in front of the organ, is a gallery (projecting like a balcony) for the singers.

On a platform ascended by seven steps and narrowed by the form of the central arch to a width of about 34 feet, the choir forms seven sides of a regular dodecagon. In front of the central side of the apse is the high altar, and this embraces the architecture of the interior in a perspective vanishing-point of all lines in the form of a ciborium altar, surmounted by a canopy, crowned with a cross. The wall at the back of the altar is decorated with an admirable painting of "The Baptism in Jordan," in honour of St. JOHN THE BAPTIST, the patron saint of the church; the tabernacle, in bronze relief, represents "CHRIST as the Judge of the World;" the back of the candlestick-shelf is in the



INTERIOR, SHOWING CHOIR.

form of shallow niches divided by small columns, and in these niches the Twelve Apostles are painted in miniature; the crucifix and candlesticks complete the furniture of the altar-table, and this stands on columns of stone.

The treatment of windows and walls is in strong-coloured tones in keeping with the style. The central window in the apse represents "CHRIST in Glory," surrounded by the symbols of the four Evangelists, whilst in the other windows are represented, under baldacchini, SS. PETER and PAUL, and the four great fathers of the Latin Church, St. AUGUSTIN, St. AMBROSE, St. GREGORY and St. JEROME.

The side-aisles, with the side-altars, are also supplied with pictures which relate to the VIRGIN MARY and St. WENDELIN, in rich massive frames; the windows of the lady chapel represent St. JOSEPH, St. ANNE and St. JAMES; whilst the windows in St. Wendelin's Chapel depict three saints of the district who enjoy local veneration from ancient times.

The twelve round windows in the side aisles of the nave and the transverse walls of the towers are decorated with glass and wall-paintings respectively, in medallion form, representing the "Stations of the Cross," and these, in conjunction with the great "rose-window" over the organ, shed a warm-toned but very subdued and cheerful light upon the polychromatic painted details of the interior, whilst the sunk windows of the nave, high up and removed from the sight of the congregation, filled with panes of clear bot tle-

glass with coloured borders, fully and strongly illuminate the vaulting of the roof, which roof is enlivened by the ribs being painted in some parts and the plain surfaces being richly decorated; the whole effect of the roof conformation is particularly light and cheerful, in spite of the wide span of the arch.

The colouring of the interior was controlled by the flesh-tint of the sandstone, which, in shade and tone, formed the base of the colour-effect aimed at by the architect, the altar-tables (of white Murgthal sandstone) and all the principal architectural details with special accentuation of the bases, capitals and archivolts, &c., are painted architecturally.

Figure decoration, in the form of paintings on the walls, has been executed as follows:—On the oblique front of the chancel-arch, in the arch itself, "The Holy Trinity and the Heavenly Powers" are drawn; whilst on the shafts of the arch are votive pictures of "The Heart of JESUS" and "The Heart of MARY"; on the arch over the portal an "Annunciation"; in the lunette over the entrance in the vestibule, "CHRIST inviting the weary and heavy laden." In the tympan in the vestibule is a relief of "The VIRGIN MARY and Child," whilst on the consoles the figures of SS. PETER and PAUL will stand. The six wall-surfaces in the choir are now waiting for the artist to complete his work.

The large and handsome crucifix suspended from the arch of the choir was carved by J. EBERLE, of Ueberlingen. In decorated wood-carving are the figures of the four evangelists in the pulpit. The organ (ornamented with a statue in wood of St. CECILIA by the sculptor DIETSCHE) contains thirty stops, and was made by Messrs. VOIT & SONS, of Durlach, at a cost of 850*l.*, and is a very fine instrument. The bronze relief on the high altar was designed by the architect, Herr WILLIARD, and was made by Herr FÜRSTEIN, in Freiburg, at a cost of 300*l.*; the figure wall-paintings were executed by Herr KONRAD SCHMIDER, of Carlsruhe; the paintings on glass by Herr H. BEILER, of Heidelberg; the carpentry and the wrought-iron work were executed by the workmen of Forbach and the Lower Murgthal.

The cost of the building (independent of the cost of the organ, the clock, the bells and the high altar) amounts to 16,500*l.*, the total of the cost being from 18,000*l.* to 20,000*l.* Had the funds permitted, the church would have been one-tenth larger in all dimensions of length, height and breadth; but it speaks marvellously well for so small a community that no obstacle was raised to the expenditure of so large a sum for their church—a church that does honour architecturally to the age in which it is raised, and to the people who so freely contributed from the means at their command to possess so beautiful a structure as this which now adorns their little town. The church has since been duly consecrated, amidst great rejoicings, by His Grace the Archbishop of Freiburg (Dr. JOHN CHRISTIAN ROOS), in the Duchy of Baden.

THE SOCIETY OF ARCHITECTS' EXCURSION TO BELGIUM.

(*Concluded from page* 124.)

AUDENARDE is like Tournai, in that it has one central feature; but here it is the Hôtel de Ville, better designed and better placed even than that of Tournai, with its weather-stained, beautifully-toned old Gothic front, in two flanks, to a central crown-capped tower, facing the Grande Place. Here the Bourgmestre and his senior Echevin received the members of the Society of Architects on Wednesday morning in most hospitable fashion, making them feel at home to sketch and photograph to such extent as they might wish, and most of them were soon busy with their pencils, particularly aiming at obtaining details of the grand Renaissance door (1537) to the council chamber, of which there is a cast at the Crystal Palace, though no cast could give the crispness of the actual work. Later in the day the churches of the town were inspected, Notre Dame, recently restored, being charming in its grey tone and early Gothic detail, and St. Walburga as hideous in the nineteenth-century Renaissance plaster-work—as bad as bad can be—which hides the Romanesque beneath, soon, it is to be hoped, to be revealed again and properly restored. A view up the river must not be forgotten: it revealed the remarkably simple drainage system of the town, the privies overhanging the stream.

Courtrai possesses only one little thing of really great architectural value, and that is the chimneypiece to the Hôtel de Ville, as fine a specimen of Gothic carving in stone as the council-chamber door at Audenarde is of the wood-carver's art, and situated in a room most harmoniously coloured, with modern frescoes on the walls by GUFFENS, SWERTS and JANESENS, the most remarkable being the *Crusader's Departure*, which has been reproduced in *The Architect*. Fortunately, Thursday was brilliantly fine, so that the rich colour of the old brick and plaster-work of the older houses of Courtrai could be appreciated thoroughly, especially those in the convent, or Béguinage, of St. Elizabeth. The pyramidal-roofed towers of the old water-gate, and the red brick tower of the old hall, with its central spire and four corner ones, also claimed deserved attention; but many members spent a great part of the day in purchasing lace as presents for their friends—a sure sign that the tour was coming to an end.

Seeking in Ypres, the last town visited, for a characteristic feature, it is readily discerned in its bold and massive towers and its beautiful street vistas, greatly helped by the streets converging to the Place, and to the position of the Cathedral and the huge Cloth Hall, the latter facing the Place, and being sufficiently low in elevation to allow of the former being seen above it. Neither though are of exceptional architectural merit, though the great room of the Cloth Hall contains some excellent modern frescoes by M. PAUWELS, and has a roof with curious and somewhat weak construction at the angles, a central storey-post being used to support the angle tie-beam; and the seventeenth-century light choir-stalls in the Cathedral are worthy of a passing word. Friday, when Ypres was visited, was again a day of brilliant sunshine, and the colour effects of the old streets and houses were most exquisite in their quiet tone.

Thus the excursion ended, and the excursionists turned towards home, pleased with all that they had seen and the hospitable reception they had met with everywhere, but convinced that in sanitary matters the Belgians have yet much to learn, and might with much advantage come to England for their lesson.

ART EMBROIDERY IN JAPAN.

TO the great goddess Kwannon herself, writes a correspondent of the *Manchester Guardian*, the goddess of beneficence and beauty, the Japanese ascribe the invention of the art of embroidery. But—alas, for the pleasant myths of nations!—the severe studies of history and anthropology brush them ruthlessly aside and expose the naked truth. According to the views of the Japanese, Japan was the first of all created countries; how and when the rest of the world was created does not concern them, so long as they feel assured that the land of the Rising Sun was the first-born of the gods. But notwithstanding this boasted antiquity, there are irrefutable proofs that Japan is a juvenile in age compared with China, and that she derived embroidery, as she did her Buddhist religion, her language and civilisation, from this ancient mother of Oriental arts. In the art, however, of embroidery, as in some others, notably in lacquer and painting, the pupil has outstripped her teacher. Chinese embroidery remains the same as it has been for centuries—fine in workmanship, but formal and traditional in design, and to European eyes often crude and violent in colour. The same industry has become in the hands of the Japanese a living art, realising, sometimes even more than painting, the love of the Japanese for tender colour, subtle harmonies of tone, and poetic representations of nature in her joyous moods. The embroiderer is in Japan no servile copyist, but an artist, using, as we shall see, his needle and a few reels of raw silk as his brush and paints. Among the many charming customs of Japan is the kindly one of presenting gifts on all possible occasions. The gift is not, however, as is often the case with us, wrapped in brown paper and sent by parcel post, nor even, as in Paris, enclosed in delicately perfumed paper and tied with a silver cord; but it is usual to present it with a few graceful words, folded in an embroidered cloth or fukusa. A fukusa is generally from two to three feet square, made of the finest satin or crape, and embroidered with all the skill and art which the Japanese know so well how to exercise. Among the fukusas of the eighteenth century will be found some of the greatest triumphs of the embroiderer's art.

All subjects serve as motives; the figures of women, priests and the domestic gods—in the robes of which the appearances of different textures and materials are rendered by an ingenious variety of stitches with which European embroiderers of all times have been quite unacquainted—as well as flowers, birds, landscapes and still life. Embroidery is often aided by painting or printing of the foundation material, and some of the most delightful effects are produced by an undiscoverable blending of the printer's, painter's, embroiderer's and dyer's arts. As the stitches of the Japanese embroiderer are a delight to the European worker, so the varying tints of his threads are a puzzle. M. Gonse, in "L'Art Japonais," says that "a special vocabulary is required to describe them. The terms Turkey red, apple green, bottle green, lemon yellow, dead-leaf colour, sky blue, cream white, silver grey, fire red, reddish purple, with all the new names invented by our modistes will be insufficient. There are tints which only belong to fukusas, of which our European dyers have never known." And how is this? Because the Japanese embroiderer—true artist as he is—produces the tint he requires at the moment, and of the tone and combination he needs to realise the effect of nature, just as a painter, taking plain blue and red from his colour-box, combines them by his art in such a way as to give all the varying hues of the sunset sky. The method by which this is done I will describe later. Fukusas have found their way to Europe, where they but too often meet with Gothic treatment, being turned into cushions and chair backs, to suffer speedy deterioration in our smoky cities, or to be snipped into pin-cushions and curtain bands. Eighteenth-century fukusas are worthy of better treatment, for Japan will never again produce the embroideries of the golden age of feudalism.

A Japanese house is full of emptiness, for the Japanese have learnt the art of doing without. The floor spotlessly clean, and covered with smooth padded matting, serves for chair, table and bed; the wooden chopsticks dispense with knives, forks and spoons, and the hibachi of hot charcoal is the substitute for fireplace, poker and tongs. As the women wear no petticoats, bonnets, hats, gloves, boots, shoes and stockings, nor jewellery, great wardrobes and chests of drawers for clothes are unnecessary, and as household and personal linen are not used, presses are not required. Thus a Japanese household is so arranged as not to need the services of the laundress, the chimney-sweep, the knife and plate-cleaner, the shoemaker, the bonnet-maker, the glover, and, I should add, the window-cleaner, for the outer walls and the partitions between the rooms of a Japanese house are made of panels which slide over one another, and are filled with translucent paper which admits light, and thus takes the place of glass windows. One of the dainty cabinets which we are accustomed to treat in England as ornamental toys, and a small writing-table about 8 inches from the ground, are often the only articles of furniture in the room of the house of a wealthy owner. In a cupboard or double wall are thrown during the day the futons, or padded coverlets, which serve both as mattresses and bedclothes at night. In every room is found the tokonoma, or sacred recess, decorated even in the poorest houses with a vase containing a flower, and a kakemono or hanging picture, giving an impressionist sketch in black and white of a misty mountain or waving bamboo branches. In the tokonoma of the house of a wealthy person are hung the finest paintings, and here is also placed a gem or two from his art treasures, taken from his fireproof godown and changed from month to month. In a Japanese room there is neither privacy nor comfort, and hence the screen becomes a necessity, both to give shelter from the draughts which traverse the room from all sides, and some protection from the eyes of the curious. "To decorate construction, and not to construct decoration," has always been an axiom to the Japanese, as it must be to an art-loving people, and hence screen decoration has been an art to which the greatest painters—Korin, Tanyu and Hokusai—did not hesitate to devote their talents, and screen decoration is still the subject to which the highest efforts of the art-embroiderers are directed. There are screens and screens. The cranes and peacocks worked in high relief in gold paper-thread on coloured satins, which are so well known in England, and which are transported 12,000 miles, and sold at such surprisingly low figures as fine specimens of Japanese work, give not the slightest idea of the high level to which the art decoration of screens is carried here in Japan. To see what can be accomplished in this direction, visits should be paid to Mr. Nishimura's at Kioto, and to Mr. Shobe's at Yokohama and Tokio.

The gardens at the foot of the hill on which stand the temple of Chiomin and the great bronze bell, which was founded 800 years ago, were powdered over with the white blossoms of the cherry trees on the sunny day that we set out to see the work and workshops of Mr. Nishimura. Loitering seemed pleasanter that day than inquiring, and to watch the pretty figures of the Japanese girls come in groups of twos and threes up the hill, chattering and laughing under the shadow of their many-coloured paper sunshades, and take their places on one of the red-covered low tables under the trees and commence the serio-comic business of picnicing was more attractive than to be dragged in a jinrikisha to a distant part of the town to learn something of the art which gives beauty to the draperies of Japanese women and elegance to Japanese homes. But I left the gardens, the blossoming trees, the family picnic parties and the bewitching children—the most fascinating of subjects for the sketch-book—and went to Mr. Nishimura's to see his far-famed embroideries, for which he was awarded the Grand Prix at the Paris Exhibition. I was more than repaid for so doing. Art-work such as this deserves a visit, and I went more than once to obtain permanent impressions of productions so charming. The finest work is shown in a large showroom which opens by sliding panels on to a Japanese garden, and which, I afterwards found, gave several *motifs* for embroidery. Through this little garden meanders a shallow stream crossed by a stone bridge; on one side stands a grey stone lantern, which is supposed to light the soul on its annual visits home, and, half hidden by blossoming trees, is the cottage where the silent and solemn rite of the tea ceremony is performed. Of the many beautiful and quite wonderful specimens of work collected in this room I can give no adequate description. I will, however, try to sketch three pieces which were, to my mind, masterpieces of either skill or art, sometimes of both. The first is a six-fold screen representing a Japanese interior. In the first panel is embroidered in high relief a ball-like bouquet of flowers tied with ribbons, and represented as hanging against a wall, together with an open fan and a panel of wood. The next two panels represent the tokonoma; above is a frieze of painted velvet depicting a flight of swallows; below, resting on the raised shelf, is a silver and encrusted incense-burner and a gold lac tortoise; and, as if on the floor, stands a lacquer tobacco-box, all which objects are realistically embroidered to the point of deception. A screen in cut velvet of butterflies and flowers completes these panels. The fourth panel represents a bronze vase containing irises and supported on a carved wood table. The two last panels are the *tour de force*. They represent the paper wall panels of a room, one of which is pushed aside to allow of a peep into the moonlit garden beyond. Through the paper walls, which are here rendered by translucent white silk, are seen the ghosts of bamboo branches flickering in the moonlight, and last of all is seen the moon herself surrounded by clouds, and palely lighting branches of cherry-blossom which fall over the cold grey temple lamp, in which a dim light burns. This last panel is in painted crape. To obtain the effects required it will thus be seen that the arts of the painter, the printer and the embroiderer have all been enlisted, and are combined in a way which would occur to no one but a Japanese. The cool, tender tints of the moonlit garden contrast delightfully with the gorgeously-embroidered objects of the suggested interior of the room. The screen is altogether a charming example of Japanese ingenuity and Japanese conceits, and costs the moderate sum of 37*l*. The second piece I would mention is a low fourfold screen, about 2 feet high, representing the four seasons. Winter is suggested by the silvery moon lighting up the snowy ground and the bare trees; autumn, by the ruddy maple and a flight of swallows against a sunset sky; summer, by a tree-peony, with its ample flowers, leaning over a pond of water-lilies, and across the reeds is flying a solitary stork; and spring, by blossoming branches of the cherry-tree on a powdered gold ground. But these scenes are given with the rare skill of the impressionist; nothing is actually painted or embroidered, but everything is suggested, and the way in which tender touches of paint and silk embroidery and powderings of gold and silver are used, and gold thread inserted in the place of the threads of the fabric withdrawn, in order to produce these poetic little pictures, is simply exquisite. Mr. Nishimura considers his masterpiece to be a small screen, the perfection and high excellence of the work of which are, as in all the best Japanese art, not at once apparent on the face of it, except to the initiated and the connoisseur. It is a small four-panelled screen; on each panel is embroidered a single spray of a simple flower, but this flower is worked with consummate skill and delicacy and fidelity to nature. On one panel a single spray of begonia is given, in which the very pores and hairs of the green leaves are reproduced with the needle. Large and elaborate landscapes of trees and rivers and mountains were also to be seen, and so closely did they reproduce the painter's art that it was only on approaching near and on observing that the picture was worked with silk much finer than a hair, that one was convinced that one was not looking upon a painted picture.

Mr. Nishimura then did his best to lay bare his machinery, to reveal to me how it is all done, and how these wonders of embroidery, painting and dyeing are produced. He conducted me to the sheds where the stencil printing, the painting and the dyeing of the stuffs are executed, and thence to the embroidery-room, where, seated on the floor in a large, well-lit room were a number of men and boys leaning over their frames at work. Here a large landscape piece is in hand; it will take a year and a half to complete, and it will cost 950 dols. (nearly 150*l*.). The selection of the shades and tones

is left to the worker, who must be of the most expert. There four men are at work at a peacock with spread tail, and it is interesting to see—as one sees also in every embroidery school and workshop in Japan—the workman select the strands of colour from the reels of dyed silks lying on the frame, and attaching them, together with gold thread, to a hook inserted into the wooden frame, he twists them between the palms of his hands into the iridescent thread required. These are made fine or coarse as needed. The latter are laid on, or couched. Often the natural object which it is sought to reproduce is placed before the embroiderer, and he combines his silks into threads to get as near the original as possible. Thus I have seen a girl embroidering a peacock's tail place a real peacock's feather on the frame before her, she blending her blues and greens and golds in every needleful of thread in the earnest effort to rival the subtle glories of the original; and in Mr. Nishimura's workshop a pheasant and a hawk were to be seen hanging from the beam of the room, to give the workers suggestions of tones and harmonies of colour. Now we see why it is M. Gonse could find no terms to express the colourings of the Japanese embroideries, and why Europeans often make such vain searches to purchase the threads used by the Japanese in their work. They are, indeed, no more describable or purchaseable than the rainbow tints of Burne-Jones's palette, for they are made by the artist workman out of the blues and reds and yellows we all have to hand. In order to enable Japanese embroiderers to use silk freely in combinations desired, embroidery silks are simply dyed and reeled, and are not twisted. Art embroidery seems to be better paid than any other industry in Japan. There are said to be seven embroiderers in Kioto, whose services are in such great request that they can command the high wages of 5 dols. (16*s.* 8*d.*) a day. It is not unusual for a good embroiderer to earn 1 dol. (3*s.* 4*d.*) a day. Women earn from 6*d.* to 8*d.* a day for coarse work, of which there is an immense manufacture for export. Shobe's embroideries at Yokohama are quite unlike those of Nishimura in style and treatment. His successes are obtained in mignon lamp screens, on which are embroidered birds, butterflies, reeds, &c., with extraordinary tenderness of tone and restraint of colour. Three crows on a branch—a favourite Japanese motive for all kinds of decoration—is very cleverly rendered, the shading of the blacks being given by the lustre of the threads, which are laid in different directions. Most of the work is done at a little factory at Tokio, which I visited, and which I recollect as one of the pleasantest workshops I have seen in this pleasant land. Here the little apprentice girls were found busily at work. Seated on their heels at their frames, neatly dressed in blue kimonos and coloured obis, and with their abundant black hair perfectly dressed in bows and chignons, with flowers and gilt pins coquettishly stuck in on one side, they were so busily at work that they did not notice they were being sketched. In another room fine work was being done by men. Among many charming subjects I must mention that of a fish under water. The fish was first exquisitely embroidered and then partially concealed by pale blue silk threads, which were drawn across it and fastened firmly down. A water plant floating on the sheeny surface perfected the illusion. Such a subject, and so treated, is typical of the best taste of the Japanese. They admire the art most in which the workman's skill is concealed by the perfection of the result, and those motives which by their delicacy and modesty require the cultivated taste of the connoisseur to appreciate. The vulgar, flashy pieces of embroidery are made for Europe and America, and are never seen in a Japanese house. The light, airy rooms, the healthful conditions under which the people work, and their happy, intelligent faces were noticeable at Shobe's, as in many other workshops I visited. Wages are in this factory paid by the day, and for skilled work amount to 1*s.* 8*d.* and 1*s.* 10*d.* a day, exclusive of meals, which are provided.

CASHEL AND HOLYCROSS.

THE successful excursion of the Royal Society of Antiquaries of Ireland came to an end with visits to the Rock of Cashel and Holycross Abbey. A correspondent of the *Irish Times* gives the following account of the ruins :—

On arriving in Cashel we were met by Mr. J. Davis White, local hon. secretary of the Society, and author of several interesting works on the antiquities and history of his native county. He conducted us over the ruins and explained at length the various objects of interest that met our view at every turn. The ruins, from their variety, their number, their artistic proportions and the grandeur of their site, form by far the noblest and most interesting collection in the kingdom. In no other spot, as has been well said, is there gathered together "such a magnificent display of every variety of ecclesiastical architecture, round and square towers, stone roofs, crypts and shrines, Saxon, Roman and Norman, all in one common ruin, as the Rock of Cashel displays to view." The spot, as is well known, is most intimately associated with the history and deeds of a line of Irish princes, and figures largely in the popular mind and monastic history and tradition as a place of sanctity from a very remote period. The first object that meets the view is a curious stone elevation upon a rock. On one side is a figure of the Crucifixion, and on the other a figure of St. Patrick. Curious traditions are associated with it, such as that the petty kings of Munster there paid tribute, that putting the head under the south-east corner cured the toothache, and others. The object, however, of supreme importance is the chapel of King Cormac. Much controversy still exists as to the date of its foundation. There were two Cormacs, one MacCullenan (*d.* 908) and the other MacCarthy, who is said to have built it in 1134. It is highly probable, and is generally accepted, for reasons not necessary to enter into, that he was the founder. It consists of nave and chancel, not constructed on the same axis, the supposed cause being that, as the church represented the body of Christ, it was so built because the body leaned to one side when hung upon the Cross. It has no east window, and no original west door, but doors on the north and south sides. Two towers spring from each side of the end of the nave to heights of 50 and 55 feet. The chapel measures 50 feet by 18, and is 52 feet high to the roof, which is built entirely of stone. The north door is richly decorated with zigzag and bead ornamentation, corresponding with the work at Kilmalkeader and Clonkeen, surmounted by a rude sculpture representing a centaur shooting a lion. The centaur wears a helmet with nasal bar, similar to those of the Normans in the Bayeaux tapestry. The doorway consists of five concentric arches, supported by five pillars and a double pillar. A rich arch ornamented with grotesque heads separates the nave and chancel, and in the southern tower is a staircase leading to small apartments above. One contains a fireplace, with flues penetrating the walls and no chimney. The walls of the choir and nave are relieved by a series of blank arches, but the whole structure is so dim that the rich details are not well revealed, and the walls and ceiling are much blackened by damp. A recess in the north wall, the supposed tomb of Cormac, with twelfth-century work, was opened some years ago, and a fine crozier, now in the collection of the Royal Irish Academy, was found within. On the south side, at the junction of the nave and choir, stands a square tower 68 feet in height. The "font," which is said to be really a tomb, was removed by the Board of Works from the little chapel off the northern transept, and placed at the west end of the nave. The font is beautifully interlaced, and the top or covering stone, which was also sculptured, was taken down and used as a common gravestone.

Near the east angle of the north aisle of the cathedral rises the round tower of splendid proportions, 56 feet in circumference and 90 feet high. The doorway is 11 feet high, and the tower is perfect, having the conical cap. The cathedral consists of choir, nave and transepts, and square tower of vast dimensions springing from four arches 25 feet in width. The building measures 210 feet by 170 feet, and is of pure Early English, such as we get at Lincoln and Salisbury. It has two chapels off the south transept, no side aisles or western doorway, the entrances being from the north and south sides of the west window. The building was much damaged when taken by assault, and the supposed spot is shown where the Rev. Redmund Barry, Prior of the Dominicans, was bound before the fire was put to his feet by the troopers of Lord Inchiquin. The cathedral is very rich in monumental remains and magnificently-carved slabs. Among them are tombs of Archbishop Magrath, the plunderer of church property; the Comyn, Pennefather, O'Kearney, Boylan Sherlock and other families.

Among the other remains in Cashel is a Dominican Abbey, founded in 1243, which was a fine building, according to Archdall. There are hardly any traces now left of Hacket's Abbey, founded in the reign of Henry III., and of an hospital founded early in the thirteenth century.

A short drive from Cashel took us to Holycross Abbey. The abbey was founded in 1182 for Cistercian monks by Donald More O'Brien, on account of the Pope having sent a piece of the true cross, encased in gold and set in precious stones. The relic was placed in the high altar, and Camden says that in his day it drew incredible numbers of devotees. The abbey had a charter, which was several times confirmed, and its abbot was a peer, as in England. The building is of Norman workmanship, and may have been, probably, an offshoot of Monasternenagh, as may be concluded from the doorway. In the fifteenth or sixteenth century it was recast internally. In the west end the cellarium still exists, and over it was the dormitory of the lay brethren. It is divided into two buildings, and out of each are garderobes, built in two large projections extending from the west wall, which is an unusual feature, and evidently a late one in a Cistercian monastery. The whole of the refectory and offices connected therewith on the south side of the cloisters have been entirely swept away, but their position can still be traced. On the east side of the cloister garth is the range containing the sacristy, chapter-house, parlour and common-room

of the monks. East of this is a large block of offices and other buildings in a more or less dilapidated condition, which probably comprised the infirmary and abbey-mill. The church, which is cruciform in plan, is 130 feet long, and has a north and south aisle, north and south transept, each having two chapels, a central tower and presbytery. The west portion of the church is less altered than the choir transepts, chapels and presbytery. This portion has been entirely recast, and contains very exquisite workmanship of that period, and a specially interesting series of masons' marks, the carving displaying a great amount of Celtic feeling, and interlaced work of various patterns abounding in all directions. On the south side of the presbytery is a magnificent canopy altar tomb, with armorial arms of the Butler family, over the body of either the wife of the fourth Earl of Desmond or the wife of the fourth Earl of Ormonde. Between the two chapels in the south transept is a very interesting pillared tomb, which is popularly believed to be a tomb of one of the benefactors of the monastery. There are no armorial bearings or other identification, which doubtless were on the slab covering the tomb, the groove containing which is perfect. The beautiful monumental work and carving is largely due to the excellence of the black limestone of which the abbey is built. It is sad, however, to witness the injury that has been done to the carving in recent years. Tourists have been allowed to take away specimens of some of the most beautiful Gothic workmanship in Ireland, and boys are allowed to play against the walls and climb through the windows, destroying the cuspings of their delicate tracery. Part of the carving of the altar tomb has been broken off within the last two years, as was told us by an eye-witness of the act.

The tour ended with Holycross, and as we looked back on it we could not but feel deeply thankful to our able organiser, Mr. Robert Cochrane, who was indefatigable in his exertions, and to the many friends who made our tour one of profit and enjoyment.

THE REJECTED STATUE.

SO many versions have appeared of the causes of the dispute over the statue of Mary Queen of Scots, which M. Ringel d'Ilzach executed for the Duchess de Pomar (who is also Countess of Caithness), the editor of *Le Temps* resolved to obtain information which would present opposite views of the case, and accordingly the sculptor and the Duchess were interviewed.

Some months previous to the opening of this year's Salon, said M. Ringel to the correspondent of *Le Temps*, the Duchess of Pomar came to see me, and informed me of her intention to present a statue of Marie Stuart to the city of Paris. I was asked if I would undertake the execution of the work, on the conditions that I was not to expect payment unless the statue was considered to be worthy of erection in a public place of the city, that the model was to be prepared as quickly as possible and according to instructions to be given by the Duchess, that it was to be exhibited in the Salon, and that the marble statue was to be completed by December 1892. I accepted the conditions. It became necessary, before commencing, to be informed of the ideas of the Duchess, and it was with difficulty an understanding was arrived at. In the first place, I was informed that the Duchess considered Marie Stuart to be superior to Joan of Arc as the tutelary spirit of France, and therefore I was to represent the Queen in the pose of the "génie de la Bastille." She was to have wings, with a star on her forehead, not necessarily of real diamonds, to be standing on one foot, with one leg in the air, the arms were to be stretched in front, and the drapery was to be a simple chemise, which was to fall in graceful lines. After long discussions I was able to persuade the Duchess that it was better to represent Marie Stuart as a Queen than as an allegoric spirit of the Bastille.

Having come to an agreement on one point, I made it my business to seek for portraits of Marie Stuart in the Louvre, and I was permitted to make a model of the face of the Queen after an authentic medal. I next set about the figure. When the model was completed I wrote to the Duchess requesting the favour of a visit in order to obtain her opinion of my work; but I was informed by letter that such a visit was impossible, owing to some difficulty on account of the coachman. I then made a sketch in bronze and sent it to the Duchess. It was declared to be "adorable," and I was asked to obtain a dozen photographs of it, which were to be distributed among her friends. The bronze I had offered, I was informed, was to be preserved as a treasure.

In accordance with the arrangements, I exhibited the statue of Marie Stuart in the Salon of the Champ de Mars. When the Duchess saw it she no longer expressed the admiration she felt on receiving the statuette. In fact, it seemed as if she could not find words sufficiently abusive for my work. The statue was said to be atrocious; it was described as having no resemblance to Marie Stuart—the body was like that of a scared duck and the robe was a coverlet. When I informed the Duchess that I had reproduced the features of Marie Stuart from a veritable portrait in the Louvre, she became very angry. "You believe," she said, "what history relates about Marie Stuart. But you are not aware that in every feature I resemble Marie Stuart. If you desire to realise her face you have only to contemplate mine." I then comprehended, for the first time, that what the Duchess of Pomar wished was that I should have produced her portrait.

In spite, however, of this recrimination the Duchess decided upon offering the statue to the city of Paris. This caused much embarrassment to the Council. The statue was admired, and it was accepted as a work that was historic and decorative, but it was considered that the figure of a woman who had been Queen of France and Scotland would now be inapposite in one of the public places of the city. It was found, too, that a statue could not be erected in a public place without the authority of the Government. Application was accordingly made, and, as a result, a site was offered in the Jardin de l'Infante, which lies between the Louvre and the Seine.

M. Armand Renaud (the director of the Fine Art Department of the Municipality) waited on the Duchess to thank her for the statue on behalf of the Municipal Council, and to inform her about the site which had been assigned for the work by the Government. The Duchess informed M. Renaud that if the statue was not set up in the place she had selected she would withdraw her offer and present the figure to the city of Edinburgh. After a time, however, the Duchess agreed to the site proposed by the Government, but on condition that she was accorded an apartment in the Louvre. I duly informed the authorities of the new proposal, but it was not accepted. The Duchess subsequently decided that she would not present the statue either to Paris or to Edinburgh, and, on the other hand, the action of the Duchess has caused the Municipal Council of Paris to decline the gift.

Such is the state of the affair. What is to be the fate of my statue, and whether it will be necessary to commence an action against the Duchess for payment, are questions for the future.

A correspondent of the *Temps* was also able to meet the Duchess de Pomar at Vichy and to obtain her view of the case. The correspondent having asked whether the Duchess still wished to present the city of Paris with the statue of Marie Stuart, "Certainly," replied the Duchess, "I have never said otherwise. I hold, however, to my stipulation that the statue should be erected at the intersection of the Rue Bremontier, Avenue Wagram and Boulevard Ampère, that is to say, on a small spot beside my own house." The correspondent having informed the Duchess that M. Ringel had stated that she had consented on one condition to the erection of the statue in the Jardin, she laughed and said, "That was in joke, and expressed my desire to be able to see the statue from my own rooms, but I hope no one will take such stories seriously. Besides, it was my intention to have offered a statue of Marie Antoinette for the garden where it was proposed to place that of Marie Stuart. All the difficulties have come from the Municipal Council. I have had interviews with M. Yves Guyot, Minister of Public Works; M. Alphand, and M. Level, the maire of my arrondissement, and these gentlemen have formally declared that they were all disposed to accept my offer."

In reply to another question, the Duchess explained that she was introduced to M. Ringel by her architect. "I proposed to him," she said, "to make for me a statue of Marie Stuart, and he agreed. Then we debated about the conditions. When they were arranged, I sent him a photograph of the figure on the tomb of the Queen in Westminster Abbey, which must have been a good portrait, since it was made by order of her son, James I. I have never expressed any desire about a spirit of the Bastille. What I sought was a Marie Stuart that would be simple, yet dignified, and clad in such a robe as was worn by the Queen on her way to execution, and otherwise to be treated in conformity with the photograph I had sent."

The Duchess admitted that she was delighted with the statuette, and in fact had ordered a dozen copies of it for presentation to the Municipal Council. On being asked to account for the change in her estimate of the work when it was exhibited the Duchess said:—"The reason was it in no way resembled the sketch which had been sent to me. The robe was replaced by a sort of coverlet (*édredon*) adorned with fleurs-de-lys and bands, and in place of a crucifix the hands held a mirror. Who ever saw a queen walking to the scaffold and admiring herself in a glass like a coquette? It is contrary to common sense and to history. Moreover, the statue might be said to represent a pretty woman of twenty; it bore no resemblance to the features of the unfortunate Queen. I must admit, however, that M. Ringel was commanded to remove the cross from the hands of Marie Stuart, which is extraordinary, for history is history, but he could have substituted a prayer-book instead of the mirror. In fact, M. Ringel made the statuette for me, but the fantastic statue that was seen in the Champ de Mars must have been for himself. That is why my admiration was given to one work and not to the other."

NOTES AND COMMENTS.

THE heads of some of the Greek statues are small, and it has been supposed that the sculptors deviated from nature for the sake of effect. From measurements taken by Professor VIRCHOW, of Berlin, it would appear that the sculptors were true to nature. In the course of Dr. SCHLIEMANN'S last excavations in Athens, four skulls were found which belonged to adults if not to aged persons. They were measured by Professor VIRCHOW, and he has demonstrated that the volume was below the average of more modern skulls. He came to the same conclusion in 1871, when the Professor was able to examine another batch of Greek skulls. It is quite possible that quality as well as mass should be considered in such investigations, for the Greeks were at least equal in ability to men who were endowed with bigger crania. Apart from questions of phrenology, the Professor's results are useful, for they show how unsafe it is to adopt a head as a unit of measurement when comparing ancient with modern figures.

THE walls of the Roman station at Silchester are built of flint, and it is considered that the material was obtained in large quantities from the Hampshire downs. The walls are not bonded with tiles, but with a flaggy limestone of the upper oolitic period, which was probably conveyed to the station by boats or rafts along the Thames and Kennet. A local sandstone was employed for part of the walling, and it is evident also that the Romans were able to appreciate the qualities of Purbeck marble. The use of timber for the thresholds of the gates, however, suggests that there was a limit to the supply of stone of large dimensions. Another want of the settlement must have been an adequate water supply, as the only known source that was available is a spring in the valley.

FISHERMEN, agricultural labourers, operatives and proletarians can be well utilised as subjects for pictures, but it is possible to have too much of them. In a French exhibition so many of these people appear on canvas that a historical subject, even if treated in an old-fashioned manner, becomes welcome. Politicians may find it useful to make much of the classes that in numerical strength surpass all others, and we suppose paintings devoted to "the people" are most often recommended by the French deputies to the purchasers for the Minister of Fine Arts. But there should be other considerations, and one of the causes of the decline of painting in France is owing to the premium that is put on subjects in which beauty of form and colours that are not dingy are out of place. At last some amateurs who have grown weary of the sacrifice of art to a pseudo-philanthropy are about to attempt a redemption. A society has been formed to hold exhibitions, and by one of the rules it has been resolved that paintings which are representative of contemporary events, or in which the *marin* and the *bourgeois*, the workman and the peasant will appear, are to be strictly excluded from the galleries. A great many artists have given adherence to the society, and we hope a chance will be secured for all who are not ambitious to aid in the declension of art by producing unpicturesque scenes which a photographer would despise.

THE chief of the Department of Fine Arts of the World's Columbian Exposition, Mr. HALSEY C. IVES, has taken up the matter of the best possible expression of architecture as a fine art, and, according to the *Inland Architect*, has also begun correspondence with European architectural societies regarding adequate exhibits of recent architectural progress. A special effort will be made to secure from Europe as large collections as possible of reproductions from monumental decorations, which, it is expected, will probably remain in America, and give a rare opportunity for comparison. Building and construction will not be included in the Department of Fine Arts exhibit, this belonging to the class of civil engineering, as constructive architecture, in the Department of Liberal Arts. These subjects, which belong to Class 839 in Group 148, Department L, Liberal Arts, include the following:—Plans of public buildings for special purposes; large and small dwelling-houses. Dwellings and specifications for foundations, walls, partitions, floors, roofs and stairways. Estimates of amount and cost of material. Designs and models of special contrivances for safety, comfort and convenience in the manipulation of elevators, doors, windows, &c. Working plans for the mason, carpenter and painter—designs and models of bonds, arches, coping, vaulting, &c.; plastering and construction of partitions; painting and glazing. Plans of appliances for hoisting, handling and delivering. Building materials to artisans—scaffolding and ladders; special scaffolding for handling great weights; portable cranes and power elevators. Illustrations of the strength of materials. Plans and sections of special architectural forms—metallic floor-beams and girders; hollow bricks and other architectural pottery for heating and ventilation; metallic cornice and conduits; shingles and sheathing; glass roofs, floors and accessories; architectural hardware. Methods of combining materials. Protection of foundations, areas and walls against water. Working plans for paving and draining. According to the rules and regulations issued by the Department of Fine Arts, the subjects exhibited in this department will include sculpture, fresco painting on walls, and antique or modern carvings, and architects everywhere should be interested in making this department notable. In general, all works to be admitted to the Department of Fine Arts must be originals, with the exception that casts from original works by modern artists are placed in the same class with original figures and groups in marble. There will be three sections in the department: an American section, a section for foreign countries that are represented by a commission, a section comprising private collections and the works of artists from countries not represented by a commission, and all works must be examined by an official jury before they can be admitted.

ARBITRATIONS in respect of disputed accounts for architectural or engineering construction are generally unsatisfactory for all parties interested. The Liverpool Corporation of late have had much experience in that mode of obtaining settlements, and always have suffered disappointment. The case relating to the tunnel beneath the Mersey, which forms part of the works for water supply, is the latest. Messrs. MONK & NEWELL, the contractors', claim has been reduced by over 11,000*l.*, but as a set-off the arbitrator would not award any of the damages claimed by the Corporation. For work done the contractors claimed about 7,500*l.*, and the Corporation officials put down the value at 2,500*l.* The arbitrator awards 5,000*l.* It is anticipated that the arbitration will cost the Corporation between 4,000*l.* and 5,000*l.*, to which sum must be added the costs in the law courts. The loss to Liverpool is estimated at 20,000*l.*, and one of the councillors was justified when, on Wednesday, he declared the case was another illustration of the folly of the Corporation in allowing themselves to drift into litigation.

ALTHOUGH the air of Paris seems to be exceptionally pure for a city where so many inhabitants congregate and manufactories are not unknown, there are signs in the streets of the disintegration of building stones. They are infinitely less numerous than in London, and it may be on that account they secure more attention. In the case of one building the defects are just now exciting some alarm. All visitors know the church La Trinité, which was erected not many years ago, Early Renaissance having been adopted with much freedom for the style. The design failed to please Mr. FERGUSSON, but he admitted that the proportions were good and the ornamentation rich. As in most French buildings of importance, sculpture is introduced with much judgment. The stone used for some of the statues does not appear adapted to withstand the air that blows down from Montmartre, and parts of figures have fallen. There are so many sculptors available in Paris, it is not difficult to replace a series of statues, and accordingly the apprehended destruction of the figures does not cause much grief. But in front of the church is a garden, which is much frequented by nurses, children and assiduous readers of journals. They are now held to be in danger, through the want of cohesion in the stone. If an accident were to arise to the least among them from the fall of a head or an arm of a statue, it would go hard with the civil and other authorities who have control of the churches.



FLOR

FROM A DRAWING B

(Actual size of the Drat

at 4th 1891.



INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

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E LATE G. BASEVI.

t. 3 in. by 1 ft. 7½ in.)



INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET. FETTER LANE, E.C.

An Artist's House, Kensington.

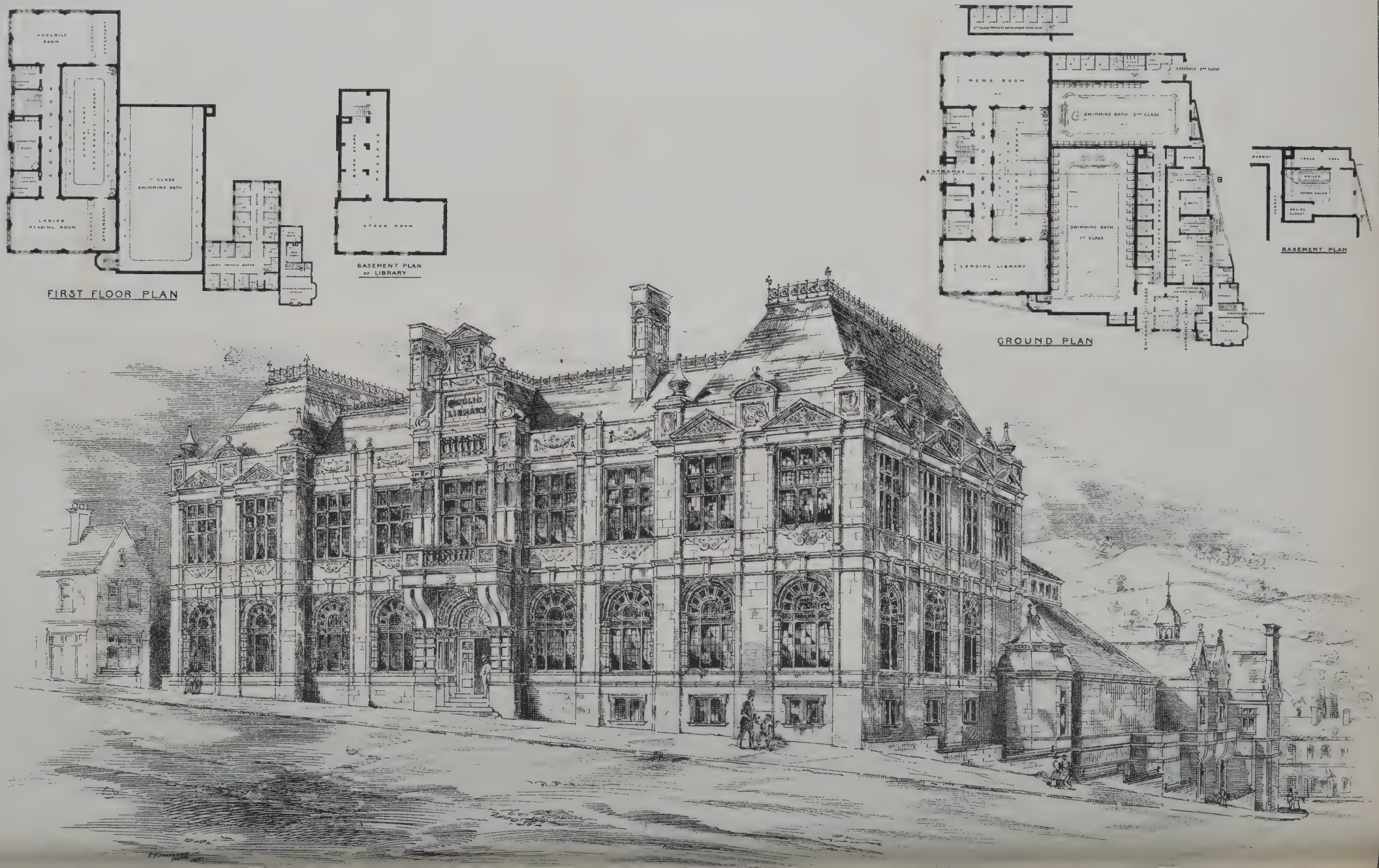
JOHN BELCHER, Architect.

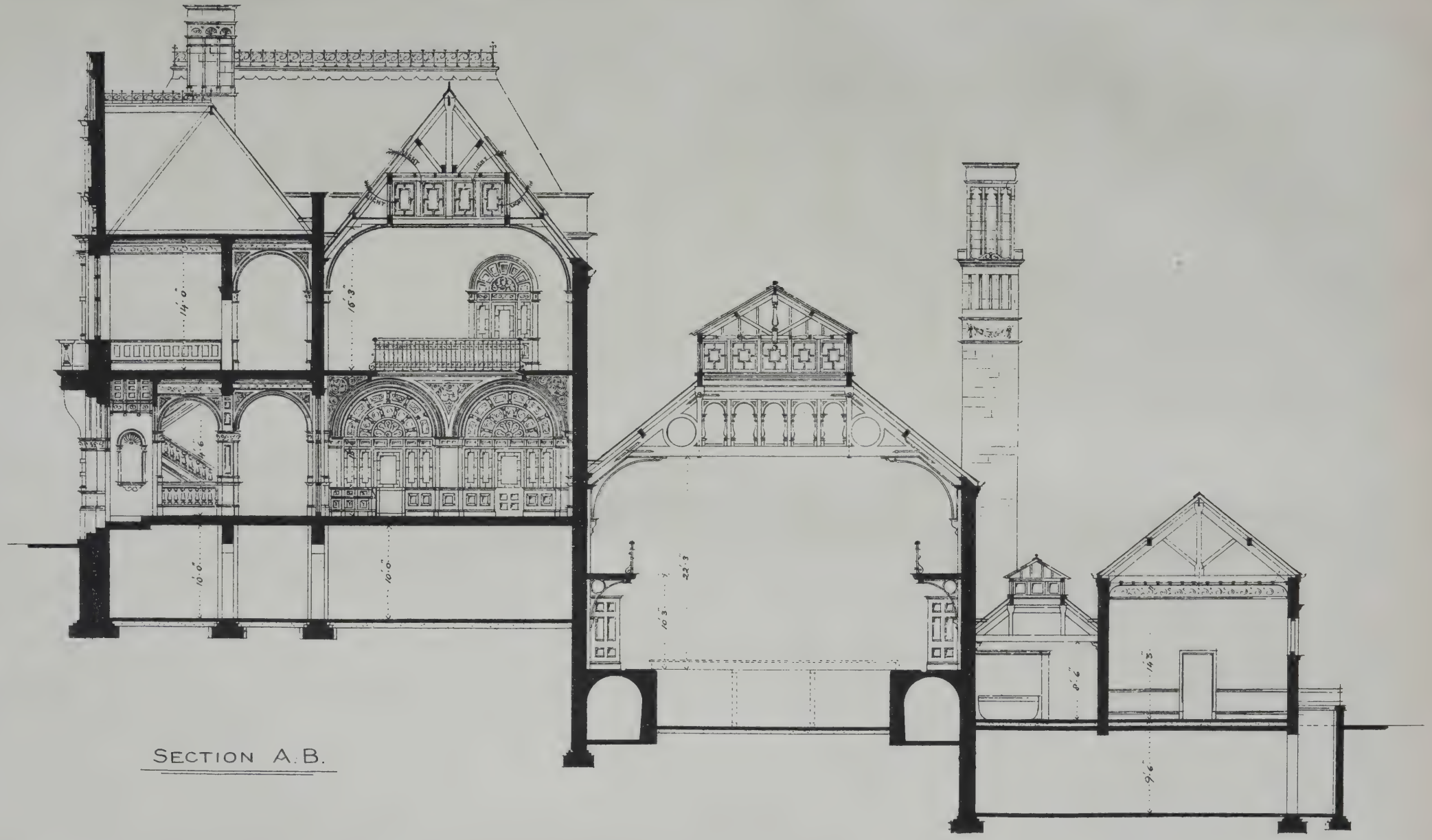


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WESTMINSTER ABBEY: NEW FRONT TO NORTH TRANSEPT.

SIR G. GILBERT SCOTT, R.A.
J. L. PEARSON, R.A. } Architects.


JUVENILE ROOM
ATTENDANT
COMMITTEE ROOM
CORRIDOR
UPPER PART REFERENCE LIBRARY
1st CLASS SWIMMING BATH
LADIES READING ROOM
LADIES PRIVATE BATHS
FIRST FLOOR PLAN
BOOK STORE
PASSAGE
STOCK ROOM
BASEMENT PLAN OF LIBRARY
NEWS ROOM
ENTRANCE 2nd CLASS
SWIMMING BATH 2nd CLASS
ENTRANCE
A
B
CORRIDOR
RECEIVING LIBRARY
LENDING LIBRARY
SWIMMING BATH 1st CLASS
HOT ROOM
BATH
GROUND PLAN
BOILER
EXTRA BOILER
DRYING CLOSET
BASEMENT PLAN
PUBLIC LIBRARY



SECTION A.B.

DESIGN FOR BATHS AND LIBRARY, DEWSBURY.

By Messrs. DAWES & HOYLAND, Architects.

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 402.—AN ARTIST'S HOUSE, KENSINGTON. [JOHN BELCHER.]

NO. 403.—WESTMINSTER ABBEY. NEW FRONT TO NORTH TRANSEPT. [SIR G. SCOTT, R.A.; J. L. PEARSON, R.A.]

NO. 404.—FLORENCE. [THE LATE G. BASEVI.]

PUBLIC BATHS AND PUBLIC LIBRARY, DEWSBURY.

WE give an illustration of the designs submitted in competition by Messrs. DAWES & HOYLAND, of Manchester and London, for the proposed new baths and library at Dewsbury. The accommodation comprises one first-class swimming-bath, with galleries over for the use of spectators at swimming fêtes; and one second-class swimming-bath, with the necessary number of dressing-boxes in each. First and second-class private baths for ladies and gentlemen, Turkish, shower and vapour baths, superintendent's office and residence, urinals, water-closets, boiler-rooms, drying-closets, accommodation for washing and drying towels, bathing drawers, &c., but no public laundry, as it was not considered necessary. Provision is made for complete water supply, drainage, heating, lighting, ventilating and all fittings required. The library contains the following rooms:—Lending library, newsroom, reference library, stock-room, committee-room, ladies reading-room, juvenile reading-room, water-closets, lavatories, &c.

In accordance with the instructions issued to competitors, the cost was not to exceed 12,000*l.* The principal front of the building was to face Wellington Road. All the outside work to be of stone. The rooms used for library and reference library to be fireproof. The water from the roofs, yards and swimming-baths to be conveyed to the nearest surface-water main drain, and the sewage proper to be delivered into the nearest main sewer. A double penstock chamber to be constructed to receive the sewage and surface water, and to contain two penstocks, and arranged so that the surface water may be used for flushing purposes when required.

The first-class baths are of a suitable length for swimming races and entertainments. All steps are recessed in the wall, and there are no fixed obstructions in the swimming-baths below the water-line. The ends of the baths are rectangular, with slightly rounded corners. Provision is made for the water from the first-class bath to be run into the second-class swimming-bath; but separate outlets also are provided, so that either can be emptied independently of the other. The first-class swimming-bath is arranged so as to admit of its being converted into a gymnasium during the winter. For this purpose a strong roof is constructed for attaching gymnastic apparatus. In the second-class bath a "soaphole," or small additional bath, is provided. Both the swimming-baths slope from end to end.

Separate entrances are provided for the baths and library. The library and reading-rooms are so arranged that the attendants in the library can overlook the reference library and reading-rooms. The site contains about 2,108 square yards available for building upon.

THE ORDNANCE SURVEY.

A PAPER was read by Mr. H. T. Crook, C.E., at the Cardiff meeting of the British Association on the Ordnance Survey. He said the failure of the Ordnance Survey to supply the cartographical needs of the general public was sought to be excused on the ground that it was not the Department's business to cater for the public, and that its attention had been chiefly devoted to the cadastral survey. The Department would appear to wish to be judged by the work which it did for special State purposes and for particular classes who used maps in their professional avocations. It was to those engaged in Imperial and local administration, to engineers and others engaged in public works, that the survey authorities more especially appealed. To these classes good large-scale surveys were absolutely indispensable. That was why he ventured to ask their attention to the subject, believing that at a time when some interest had been aroused in the question and reforms promised, that an expression of opinion from those most competent to judge of the work of the survey could not but be of advantage. The general efficiency of the organisation for surveying and the mathematical accuracy of the work done were not disputed, and they were so greatly extolled annually in the report of progress presented to Parliament that there was no necessity to dwell upon them here. Very likely the military organisation had been of some advantage to the service in establishing discipline, order and regularity, and so long as it worked well there was no reason why it should be changed until the original surveys were completed. He specified plans and maps which were being made and published, and contended that no adequate or systematic provision has yet been made for a periodical revision of the completed town and parish plans, and consequently for the smaller scale maps also which were reproduced from them. Besides the completion of the 25-inch map in Lancashire and Yorkshire, there remained six Scottish counties and almost the whole of Ireland, excepting Dublin, to be surveyed on this scale. The money for this re-survey should be voted under a separate head in the Estimates; the public would then be able to see how ridiculously inadequate was the sum allowed for the real revision work. Twenty years ago General Sir Henry James estimated the amount required annually would be about 40,000*l.*, since when the number of kinds of maps published had increased, and the larger population and development of industries caused more changes in the detail requiring correction. The appropriation of the Parliamentary grant was as follows:—

Year.	Total Vote for Survey.	Under head of Cadastral Survey.	Under head of Revision.	Cadastral Survey and Revision together.
	£	£	£	£
1886-87 . .	258,000	189,951	5,000	194,951
1887-88 . .	230,000	149,079	15,500	164,579
1888-89 . .	223,000	93,164	64,000	157,164
1889-90 . .	215,000	72,000	74,000	146,800
1890-91 . .	216,000	30,000	139,860	169,860
1891-92 . .	215,770	22,300	139,950	162,250

The remainder of the grant was absorbed in the expenses of publication, special work for other departments, and maps for the Land Judges' Court in Ireland. The total vote here given did not include military pay and other expenditure, for which about 50,000*l.* per annum was provided under other estimates. He had not been able to find what the entire cost of the survey amounted to from the commencement to the present date, but it was obvious that it must be a sum of many millions. If the work was worth doing it was the height of folly not to allow an adequate sum for its maintenance. Owing to the neglect of revision, a large portion of the country would have to be re-surveyed at a greatly increased cost to the country over the amount which would have been sufficient had a proper system of periodical or constant revision been in operation. And not only was the direct cost increased, but indirectly a very large expenditure is constantly going on all over the country to bring the plans or maps up to date when they are required for public or private use, in local government public works or land transactions. As plans or maps so corrected are not available for general use, the work was often done many times over.

He suggested that first of all the enormous accumulated arrears must be got rid of. All those portions of the country where the changes had been great, either on account of the increase of population or the lapse of time since the survey was made, should be dealt with as re-survey, and a vote of sufficient amount taken to enable the work to be completed in the shortest possible period. Then with regard to the revision, he suggested that it be carried on at least in the larger centres of population continuously under a civilian staff, which should have its permanent superintendents not liable to be removed after a short interval, as are the R.E. officers. The country should be divided into a number of convenient districts, each with its ordnance survey office superintendent and assistants responsible for the revision of the maps of the district once during the revision period. The services of this office might be at the disposal of anyone requiring a plan or map with manuscript corrections to date, on the payment of fees proportionate to the services rendered. By this means the materials for new editions in the larger towns would be constantly accumulating, and wherever the sale of maps was large, new corrected editions could be published at little expense without waiting for the revision period to expire. That such an office would be largely resorted to there could be no doubt. Large sums were spent by the municipalities of our great towns in keeping the town map up to date. There were several instances where the Department had been paid for revised maps or for surveys made in advance of the general survey of the particular county or district. The principle of the method he advocated was therefore already adopted; it only required to be developed and systematised. Of the town plans and the parish maps it

would be difficult to justify any complaint grounded on absence of information which ought to be given on maps of the kind, but with regard to the 6-inch maps it was otherwise. The 6-inch map had no *raison d'être* if it was not for the use of the engineer, geologist, and other scientific workers. Yet in its present form it was lamentably deficient in the very information which they most require, that was, it failed in depicting the form of the terrain. Among the defects of the six-inch survey was its publication as a county map. For most of the purposes for which this map was used, the political or administrative boundaries were of secondary importance. But because the map was originally ordered by Parliament as a county map, the Department, in slavish adherence to routine, continued to regard each county as though it were an independent state or an oceanic island, thus making it difficult to form a decent map of a river basin if it were in more than one county; and if it were in four counties, as in the case of the basin of the Mersey, the task was impossible. There was apparently no reason why in new editions of the six-inch maps the sheet lines should not be arranged so as to avoid the unsatisfactory and expensive patchwork caused by the inter-lapping of plans constructed to different meridians. If the entire map of the kingdom were constructed in long sections, each with its central meridian, the distortion would not be nearly so great at the lines of junction as it is under the present system on the boundaries of a large county such as Yorkshire. An important consideration in regard to the sale of maps was the scale of prices. This varied in an extraordinary and inexplicable manner, and in the case of the cadastral maps some of the charges were extortionate and prohibitive. Another point was the absence of any index worthy of the name to the plans and publications of the Ordnance survey. The difficulty to the public of getting information about the maps was very great. The Government exacting cash payments from the agent, he could not give long credit to the country booksellers, and consequently they did not (with a few exceptions) keep any stock of the large scale and expensive plans. Even for those who "knew the ropes," to obtain a large scale map in the country was a matter often involving much loss of time and trial of temper. He said, in conclusion, if these various matters were attended to, the utility of the survey maps would be vastly increased. The high scientific work of the survey had been admirably accomplished, and if the nation was to see full value for its expenditure on this service it was essential that the value of the work be maintained by revision, and that more businesslike arrangements be made for the publication of the maps.

Mr. Oliver Jones referred especially to the latest surveys on the 25-inch scale, and said it was very unfortunate that when the ordnance surveyors were about the country getting the names of places, they would insist upon going to persons who had no knowledge of the subject. Hence had crept in various inaccuracies.

Mr. Tait pointed out defects in the 6-inch survey of Antrim, in which the contour lines were not complete.

Dr. Trelawney Saunders called attention to the want of contours in Devonshire maps in respect of eminences above 1,000 feet, and condemned the petty economy which had been exercised by the Department. He spoke of means available for accomplishing the revision.

Mr. Batten dwelt upon the importance of the 1-inch survey, and thought the attention of the authorities should be directed especially to the desirability of its being completed.

Mr. Whitmell mentioned as a curious circumstance that the map of the locality showed Barry Dock, but did not show the railway which supplied that dock with coal.

Mr. Usher pointed out a defect in regard to the coast-line.

The President spoke of the necessity of impressing upon the Government the desirability of liberal grants being made towards the purpose of keeping the maps up to date. He expressed to Mr. Crook the thanks of the section.

SCOTTISH MONUMENTAL EFFIGIES OF THE FIFTEENTH CENTURY.

SCULPTURED monumental tombs of a good class, prior to the Reformation period, are exceedingly scarce in Scotland. The few that exist, says Mr. Brydall in the *Glasgow Herald*, are in the lowlands and more eastern parts of the country, in connection with churches associated with the development of the early Gothic or English-Norman style of architecture; but the numerous now vacant recesses, such as in the cathedrals of Dunblane and Aberdeen, as well as fragments which have been discovered at various intervals, testify to the fact that they were at one time very numerous. Excepting the peculiar one attributed to Marjory Bruce, known as "Queen Blearie," in Paisley Abbey, no monumental tombs of royal personages now exist in Scotland. Those of Mary de Couci, the second wife of Alexander II., in Newbattle Abbey, Robert the Bruce in Dunfermline, and Robert II. at Scone have long ago disappeared, and the empty sculptured canopy of the tomb of Bishop Kennedy at St. Andrews is probably the only representative of our ecclesiastical monumental tombs. The effects of time, the ravages of war, the convulsions of the Reformation, and the unprincipled pilferers of stones from our old edifices, have in this respect impoverished the country.

By far the most interesting and important effigies in Scotland are those of the Douglases in the Kirk of St. Bride at Douglas. According to the dates which are attached to the personages represented the oldest is the figure of Marjory Abernethy, wife of Hugh, sixth Lord Douglas, who died in 1259. The stone is very much crumbled away, the figure is clothed in simply-arranged drapery extending from the shoulders to the feet, which rest upon a spiritedly-carved block, covered with foliated ornament of the style of the period. The effigy of the good Sir James, who was killed by the Moors in 1330-31, is considerably mutilated; the head seems to have been clothed in a camail or hood of mail, with an orle or wreath; a simply and well-arranged surcoat, parted above the knees, discloses an under tunic; the left hand grasps a sheathed sword-hilt attached to a slightly-ornamented belt, the arm being covered by a shield; the right arm and lower left leg are gone. The figure bears a kind of resemblance to those in the Temple Church of London of an earlier date, and it is to be noted that while this Douglas is cross-legged, that custom had at the period become nearly obsolete in England. The probability of course is that he was thus represented on account of having died while engaged in pilgrimage and in battle against the enemies of the Cross.

In the same place is a large canopied tomb of Archibald, fifth Earl of Douglas, Marshal of France, and second Duke of Touraine, which latter title was conferred by Charles VII. of France upon his father, who was slain at the battle of Verneuil, and buried in the church of St. Gratian at Tournai in 1424. This Earl Archibald, who died in 1438, is represented habited in his robes of dignity, coroneted, with a broad, rich belt round his waist, and an almost obliterated marginal inscription. The base contains five, remaining out of six, small upright canopied figures extremely quaint and elaborate.

A less ornate but more beautifully-executed monument in the same place contains the broken effigies of James, surnamed the "Gross," seventh Earl of Douglas, died 1443, with his wife, Lady Beatrix Sinclair, daughter of the Earl of Orkney. On this tomb the earl is represented in armour, with a rich girdle, collar and mantle, the hands pressed together, and the wreathed head resting on a conical tilting helmet. It is surmounted by a full heraldic achievement; the base contains six small male figures—the second of which is habited as an ecclesiastic, and the others in armour—and four female figures, the last of which, from the headdress, is supposed to have been unmarried; the male and female figures are divided by an angel bearing impaled and quartered arms. The carvings over the mouldings of this beautiful wall-tomb are of remarkable elegance, bearing a very close resemblance in the execution to similar details on the walls of Melrose Abbey, possibly executed by the same carvers. It is said that the mutilations on these figures were largely the work of some of Cromwell's troopers who were at one time quartered there. Even yet traces of the former painting and gilding are evident on the escutcheons as well as on the figures, the restorations having been judiciously confined to the canopies and mouldings.

In addition to those on the Douglas tombs of the chivalric fifteenth century, which record the prowess of the knights of that illustrious line and the renown which they gained under the oriflamme of St. Denis, a sufficient number of other figures exist in Scotland which serve not only to illustrate that branch of the art of the country, but also to display the rich knightly armour and costume of the period. Interesting effigies of one of the knights of Houston and his lady are preserved in the modern parish church of Houston in Renfrewshire. The knight died 1450, and the lady six years later. His effigy represents him fully armed, spurred and helmeted in a large bassinet with a broad sword girdle of a rich and bold design; the jupon bears an escutcheon on the breast, on which the arms are faintly traceable, and the lower edge is carved into an elaborate leaf pattern. It bears a tolerably close resemblance to similar English effigies. This is especially noticeable in the figure of Sir Thomas Cawne in Ightham Church in Kent, almost identical in costume, the chief difference in treatment consisting in the Scottish knight having his hands pressed together as if in prayer, while the English one has his right hand on his breast and his left on the sword-hilt. It also bears some resemblance in point of costume, although of a rather later period, to the effigy of John de Montacute, a younger son of the first Earl of Salisbury, whose will is dated 1388. The effigy of the lady represents her in an extremely graceful costume; the head-dress, unlike the fantastic forms then in vogue, may be described as a kind of small turban with a slight fringe of hair or lace depending from it on to the forehead, and a side veil with broidered edge falling over the shoulders. A close-fitting bodice extending considerably lower than the waist is richly

embroidered ; the tight sleeves are seamed with a double row of pearls ; the dress falls from beneath the bodice in simple folds covering the feet ; and the mantle, which is fastened across the breast from the shoulders by a cord, has a rich border of fleurs-de-lys and pearls. The resemblance between this and English female effigies establishes the fact that the costume of the upper classes of the two kingdoms was very similar, Scotland being rather later in the adoption of new fashions.

Almost identical with the Houston effigies are those on the tomb in the parish church of Renfrew. Over the arch, in Saxon letters, is the inscription, "Hic jacet joh[anne]s ros miles quo[n]dam dominus de hawkehede et marjoria u[x]or sua or[a]to pro ipsis qui obiit." These lie upon a base containing eleven upright panels, nine of which contain armorial bearings, the first being filled in with an angel playing on a violin and the eleventh with a lute. As on the Houston effigy, the knight's helmet is of the form known as the great bassinet, with neck-pieces of plate and the shoulders covered by mail. The latter in this case is the ordinary ringed kind, while the Houston mail is more like the kind known as "rustred." This form of helmet was in use as early as the thirteenth century, and was superseded by the salade in the fifteenth, to which this figure belongs. The effigy of the Stewart of Bute (1296?) differs in this respect, having a smaller bassinet and the head resting on the larger tilting helmet instead of a cushion, being proof of an earlier date. The great vizorless bassinet was in use in England and on the Continent in the fourteenth century, but the form of the sollerets, as well as the mail on the shoulders, are characteristic of the middle of the fifteenth century. This Sir John Ross of Hawkhead is the hero of a local tradition, variously told, from which he received the sobriquet of "Palm-my-arm." Apart from this we find him as Ross of Halket, along with two of the Douglases, accepting the challenge of three Burgundian knights—the two Lalains and Meriadet, Lord of Longueville—at a tournament held by James II. at Stirling, on the occasion of his marriage with Mary of Gueldres. In this encounter the Scots were not quite so successful as was Ross in the local tradition, the king having thrown down his gauntlet as a sign to stop the contest when one of the Douglases was felled by the axe of his opponent. This occurred in 1449.

The Corstorphine monuments are well known to all those in Edinburgh interested in such remains. Of the two in the chancel of the church that to the right of the doorway is cut in marble, and represents the second Sir John Forrester, who succeeded in 1441 (died 1454), with his wife Marian Stewart, Lady Dalswinton, widow of Sir John Stewart. He distinguished himself as a military man, especially at the siege of Branxton Castle. The other tomb bears the figures of the Sir John Forrester who in 1429 founded the Collegiate Church of Corstorphine and was Lord Privy Seal during the Regency of Murdoch, Duke of Albany. It is stated that he was thrice married, but this is doubtful, and the lady who lies beside him on the tomb represents Dame Jean Saintclair, a daughter of Henry, Earl of Orkney. The bases of both of these contain family armorials, and the date of the costumes corresponds with the period with which they are identified. The present Heraldic Exhibition contains a drawing by Mr. Bruce Armstrong of the curious and interesting figures, of an earlier date, of Walter Stewart, Earl of Monteith, and his wife, in the chancel of the Priory Church of Inchmahone, the Isle of Rest. The group is peculiar, as representing the husband and wife in a loving embrace.

THE LATE LEONARD C. WYON.

THE Royal Mint has lost a valuable officer by the death of Mr. Leonard C. Wyon, modeller and engraver, and one of a family that has long been associated with that Department. Mr. Leonard Wyon was the son of the late Mr. William Wyon, R.A., chief engraver to the Mint, and was born at the Mint in 1826. He was educated at Merchant Taylors' School, and was silver medallist of his year at the Royal Academy. In 1843, when he was only 17 years of age, he was appointed assistant engraver to the Mint, and on his father's death in 1851 he became modeller and chief engraver. He also succeeded his father as engraver to the Goldsmiths' Company, and was subsequently appointed engraver to the Assay offices of Birmingham, Sheffield and Chester. Mr. Wyon's whole life being thus passed in the designing of coins and medals, it is not surprising that the list of his works is somewhat long. He designed the present British bronze coinage, the original British florin, and the coinage of Australia (1857), New Grenada (1858), Canada, Cyprus, United States of Columbia, Straits Settlement, Jamaica, Uruguay, Hong Kong, Japan, Peru, Newfoundland, and the present coinage of British India. Among the war medals of Mr. Wyon's design are those for the Indian Mutiny (1857), Afghanistan (1878), Ashantee (1875), and Zululand. For the Art Union of London he designed, among others, medals of Sir D. Wilkie, J. M. W. Turner, Hogarth and T. Banks. His miscellaneous medals were exceedingly numerous, but among them should be mentioned a medal of the Emperor Nicholas of Russia, in connection with which Mr. Wyon received a graceful letter of thanks from Mr. Gladstone ; a medal to commemorate the exchange of visits in 1855 between the Queen and the Emperor of the French, and a remarkably fine portrait of William Wordsworth (1848), from a drawing from the life. This portrait, which is said to represent Wordsworth better than any other, has been reproduced in Professor W. Knight's "English Lake District." Other notable medals were those for the Great Exhibition of 1851 (the reverse only), the Exhibition of 1862, the Sydney Exhibition, 1864, and the Colonial and Indian Exhibition. These were among Mr. Wyon's chief works ; it should also be stated that many portraits of royal and other eminent persons, commissioned for various schools, societies and institutions, have been produced from his designs.

HERALDRY IN ARCHITECTURE.

THE following most interesting article is one of a valuable series which is appearing in the *Scotsman* upon the Edinburgh Heraldic Exhibition :—The ancient and truly distinctive architecture of Scotland is an ever-engaging study to all who possess patriotic feeling and artistic perception. A cursory glance at the old Scottish castles, or at representations of them, shows that, next to general grouping and structural details, heraldry presents itself as their most prominent feature of ornamentation ; and in many examples the only decorative features of any consequence are heraldic. In the drawings of *Tolquhan Castle Entrance*, by Mr. M'Gibbon, No. 172 in the present exhibition, and of *Rowallan Entrance*, by Mr. Ross, No. 182, the arms are introduced in a most effective manner over the doorway between the two bold circular towers, and form the chief point of interest in the design. In No. 181, the *Gateway of Mar's Work, Stirling*, there is a similar method of arrangement, but in this case the side towers are semi-octagonal in plan, and on the front face of each there is the addition of heraldic panels. Many of the drawings of old houses show the arms embedded or raised on simple panels over doorways when no other enrichment is resorted to. In the drawing of the *Grand Staircase of Fyvie Castle*, No. 174, there is a clever disposition of various heraldic devices, and the bold armorial band encircling the newel is a good example of the decorative utility of heraldic designs.

Armorial enrichments have a fascination which is quite unique. That which stimulates thought in any design is always more or less engaging, and as heraldry recalls and suggests such a variety of interests in connection with individuals, families, places and events, and links the present with the past, any opportunity for its introduction is welcome to the architect or designer. But, besides this, there is the charm of variety in forms of things animate and inanimate, drawn from the heavens above, the earth beneath, and the water under the earth, introduced in all the varied treatments of armorial design. Many of the illustrations in the exhibition show that in the placing of armorial bearings and in the free handling of details there is an easy adaptability to the spirit of the style in which the architect may be working. In this connection a choice armorial might be referred to—No. 673—in which the draughtsman has made the freest use of the mantling and motto tablets to give a highly decorative effect. A beautiful coat-of-arms of the Earls of Kinnoull combined with ornament in carved wood, No. 230, should also be noticed in this connection. Here the scrolls, leaves and mask are so combined with the arms as to render the composition a perfect one. Where there has been a tendency to freedom in ornamentation in any architectural composition which admitted of heraldic display, we find the most unrestrained use, not only of mottoes, symbols, monograms, but also of armorial devices, and these are introduced in every conceivable way in stone and wood-carving, marquetry, enamelling, painting, stained-glass, iron, brass and other metals and embroidery. This ornamentation was not confined to the permanent or structural portions of buildings, but was adopted freely in the adornment of all kinds of movable furniture, textile fabrics, metal and earthenware dishes, and applied even to door-knockers, as in No. 223*a*, and fire-irons, No. 69.

All designers when dealing with elaborate schemes are conscious of the risk of tiresomeness and insipidity in ornamentation derived from merely floral or animal types which have no special reference to the work in hand ; but when heraldic details can be introduced there is at once a strong *raison d'être* for the cleverest dispositions of decorative display. In addition to the value which these details contribute in the matter of form in flat drawing or on modelled surfaces, there is the charm of colour. For this we have to go to the interiors of our old buildings, where alone such means of colour expression as were in use in our country could have any permanence. The student is referred to the well-drawn and coloured illustrations, Nos. 204 to 210, of tempera work on walls and ceilings in

Earl's Hall, Stobhall and Belbegno, and also to the decorated ceiling of the Skelmorlie Aisle at Largs, Nos. 153 and 154. Nos. 206 and 208, showing the heraldic and other decorations upon the bosses between ceiling-joists, are good examples of several ceilings yet remaining. No. 154 (ceiling of Skelmorlie Aisle, Largs) should be noted as an example of clever delineation, and in studying such an example one cannot help desiring that similarly bold and artistic decorative work might be revived amongst us. Nos. 160, 262 and 263 (the Crawford Gallery in Kilbirnie Church and its heraldic details) afford illustrations of the introduction of a richly-ornamented gallery in an old church, which forms a most picturesque feature, and one well worthy of repetition in modern work. It might be remarked in passing that had our old Scottish architects been in contact with mosaic workers there might have remained to us some lovely gems of external emblazoning in the hoary stone settings of the noble ruins which still exist.

Monumental compositions such as No. 153, monument of Sir Robert Montgomerie, in the Skelmorlie Aisle, Largs, give a very effective opportunity for the introduction of coats-of-arms, as do also tombstones, of which many illustrations are given. A photograph of the picturesque entrance to the burying-vault of the Earls of Southesk might be noted. The two heraldic panels so simply introduced give the value to this composition. Drawings of quaint recumbent figures, such as No. 860, the monument to Walter Stewart, Earl of Menteith, at Inchmahone, are interesting on account of the large shields with coats-of-arms which are held at the side of the figures.

The broad and manly treatment of heraldic delineation must impress all who study the samples brought together in the exhibition. This most excellent characteristic is mainly due to the necessity there was for the most perfect clearness and legibility; the heraldic designs on emblazoned shields, embroidered cloths, stained-glass and sculptured work, requiring often to be seen at long distances from the beholder, and it is due also to their application being upon large surfaces of stone, wood or plaster, broken with strong mouldings and other architectural features, which all demanded that the heraldic work should be broad and very architectural in its character. The spirit of those ages in which heraldry grew into importance, both in our own and in other countries, had much to do with the strong artistic spirit which animates it, and too much praise cannot be bestowed on many of the exhibits which have already been referred to in other articles; while many of the later examples, especially among the seals and books, illustrate the decadence of heraldic style in the relaxing period of the later Renaissance.

Monumental brasses are of two kinds; the first consists of a quadrangular plate of brass, or of several joined so as to look like one, let into a stone slab, and engraved generally with the effigy of the person commemorated, an architectural framework with minor figures, coats-of-arms, and an inscription in the border; the background on which all these are engraved being usually elaborately diapered. This plan obtained on the Continent. The second kind of brass is the distinctively British or perhaps English kind. It consists generally of the effigy, an architectural canopy, an inscribed border or inscription plate, and a coat or coats-of-arms, all cut out in brass plate, and inlaid in their allotted positions in the stone, which forms their only background. It was thus made, perhaps, for want of brass originally, but it had the advantage of concentrating the eye on the material parts of the memorial, and perhaps concentrating the care of the engraver on the details of the effigy, &c., rather than on the background. When the brass was, as the oldest all were, set on the floor of a church or the top of an altar-tomb, the effigy was designed almost universally in a recumbent attitude, the exceptions being where it was drawn as if standing. On the mural brass, on the other hand, there was no border, and the effigy was exhibited kneeling. At an early period Continental brasses of Flemish construction and design were introduced into England, and at a later period small mural brasses began to be made in England on the Continental plan of a continuous plate. The engraving of the brass is usually done with a bold hand, but yet frequently with laborious detail and an elaborate and beautiful ornamentation. And to the fidelity of the artists of these contemporaneous records of individuals and arms, and to the fineness and durability of the metal they worked in, the herald and genealogist of to-day, to say nothing of the student of costume and the historian in general, owe some of their most important and most reliable information concerning the best ages of heraldry. But it is the very value of the material they used which has deprived us of the benefit of the greater part of their labours. The use of brasses was introduced into Britain probably about the beginning of the thirteenth century. We have evidence that the plunderer of brasses was at work there about the middle of the fifteenth, and he has been at work ever since. In early times he had ready purchasers for his spoils in the persons of the makers of new brasses, who frequently could modernise the armour of an effigy to suit altered times, or, if the plate indeed had not been turned already, could place its face downwards and engrave a new effigy on the back. Many instances of this have been discovered, where even the second engraving is comparatively early. And if all such expedients failed, the plate was still eligible for the melting-pot, to which too many hundreds, nay thousands, of brasses were consigned in aftertimes.

Scotland, whether from lack of money or abundance of stone quarries, seems never to have been very rich in brasses. However, though they are not numerous, those she possessed were pretty generally distributed. There is evidence or record of brasses having once existed in Iona, Kirkwall, Dunblane, Dunfermline, Arbroath, Seton, Whitekirk, &c.; and examples are still extant in Edinburgh, Ormiston, Aberdeen and Glasgow. English authorities argue from the character of the canopies engraved on their brasses that they were designed by the designers of their churches. If their theory holds good, Scotland, before the wars of Wallace and Bruce, may have obtained its brasses from England, whence came its "Early English" architecture, and subsequently it may have procured them or their designs similarly from France. There are few data left by which to determine this question, but it is certain that brasses on both English and Continental models have existed here. In the floor of Whitekirk parish church in East Lothian lay, till recently, a large stone slab showing the matrices of a brass of the English pattern. In the centre the effigy of an ecclesiastic has been inlaid, while round about, near the margin of the stone, are the hollow of the canopy and inscription plates. At Iona is a similar slab of great size, in which has been inlaid the effigy of a knight in armour with his sword by his side, and with his feet resting on some animal. Round the edge of the stone is the groove in which ran the border with an inscription. According to tradition, this brass was in memory of a Macleod of Macleod, and was embellished with a plate of silver. These stone matrices are described by Sir Daniel Wilson in his "Archæological and Prehistoric Annals of Scotland," and he adds that similar specimens are by no means rare. The brass at Kirkwall in memory of one of the Tullochs, bishops of Orkney, in the fifteenth century, and which is said by Principal Gordon, in his "Remarks on Orkney," to have been carried off by Cromwell's soldiery, was, on the other hand, on the Continental pattern—"a plate of copper, the full length of the grave."

The ancient Scottish brasses still in existence consist each of a quadrangular plate. They are all mural, and, with the exception of the Liddel brass in St. Nicholas's Church, Aberdeen, are small. The date of the earliest of these—the Irving brass—is about 1450. The earliest known English-made brasses of similar construction, such as that of Sir Thomas Sellynger, founder of St. George's Chapel, Windsor, date not earlier than 1475. The Irving brass alluded to is in the Drum Aisle in St. Nicholas's Church, Aberdeen. A rubbing of it (No. 1,132), taken by Mr. J. S. Davidson, Aberdeen, appears in the exhibition. It is a small plate (18⅛ inches by 13½ inches) containing an inscription, in old English characters, with—"In memory of Sir Alexander de Irvyn, second laird of Drum, Achyndor, and Forglen, of his wife, Elizabeth, daughter of Robert de Keith, Knight Marischall of Scotland." Blanks are left for the dates of their deaths, which had not occurred when the brass was erected. Two small shields near the margin of the plate bear respectively the Irvine holly bunches and the pales of Keith. This brass is noticed at some length in "Scottish Notes and Queries" of January 1888, by Mr. A. M. Munro, who points out that the popular idea is wrong in attributing this memorial to Alexander Irvine, who died in 1411 at the battle of Harlaw. This Alexander certainly married Elizabeth de Keith, but Douglas relates that he went merely through the marriage ceremony, and, falling in battle immediately thereafter, was succeeded in his estates by his younger brother Robert. Robert, on succeeding, changed his name to Alexander, and in fulfilment of a promise made to his elder brother on the way to the battle, married the widow. It is believed that it was to this Alexander, who died in 1457, that the brass was erected. Mr. Munro's theory of the blanks in the inscription is more charitable than the more usual one, which ascribes their continued presence to the negligence or the want of filial piety in the immediate heirs of the deceased. The probable reason was, he says, "simply that no person could be found in the locality to finish the work of the Continental engraver." Alexander Irvine died in 1457. The brass for the monument which the Provost and Magistrates of Edinburgh undertook, in 1454, to erect in St. Giles's Church in memory of Preston of Gorton, who brought to Scotland and bequeathed to St. Giles's an arm bone of its patron saint, was "a plate of brase, with a writ specifiand the bringing of that relik by him in Scotland, with his armis." This brass is not known to exist now. In the Old Church of Ormiston, in East Lothian, is a brass similar to these in containing only an inscription and armorial bearings, but larger and more ornamental than the Irvine brass. It dates from about 1563, and bears the arms of Alexander Cockburn and his wife, Alison Sandilands. The inscription, which is lengthy, is in Roman capitals. A

rubbing (No. 194) of this brass has been contributed by Mr. T. Ross, Edinburgh, and it has also been figured in Stirling Maxwell's "Ornamental Heraldry of the Sixteenth Century." The only ancient brass now existing in St. Giles's, Edinburgh, is that in memory of the Regent Moray; it is additionally interesting as bearing an inscription from the pen of George Buchanan. Mr. Ross's rubbing of it is No. 1,193 of the catalogue. In the upper part of the plate is the quartered coat of the Regent's arms, indicating his royal descent, and his possession of the earldom of Moray. Over the barred helmet, which is heavily mantled, is his coronet; above this his crest—a pelican in her piety. The supporters—collared greyhounds—stand on a compartment. The motto is "Salus per Christum." On either side of this achievement are seated figures, emblematic of Religion and Justice. They are represented weeping. Above them respectively are scrolls with the words "Religio" and "Justitia"; beneath are the legends "Pietas sine vindice luget" and "Jus exarmatum est;" in other words, "Piety without a defence mourns," "Justice has been disarmed." In the centre of the brass is the date (old style) of the Regent's assassination—"23 Januarii 1569." The lower part is occupied with Buchanan's inscription in Roman capitals, "Jacobo Stovarto Moraviæ Comiti Scotiæ proregi viro ætatis suæ longe optimo ab inimicis omnis memoriæ deterrimis ex insidiis extincto ceu patri communi patria mœrens posuit," which may perhaps be rendered, "A country, sorrowing as for a common father, erects this monument to James Stewart, Earl of Moray, Regent of Scotland, by far the noblest man of his age, slain from an ambuscade by the basest enemies in all history." We sometimes posture as mourners over the real or supposed vandalisms of the Reformers, but never before the brass of the Regent Moray, for it and the monument of which it was only a part were the creation of the Reformation age, James Gray, an Edinburgh goldsmith, being the engraver, and they were respected till our own nineteenth century, when, in 1829, they were pulled down and cast out of the church. The monument was irrevocably destroyed, but, thanks to the vigilance of a descendant and representative of the good Regent himself, the brass was rescued and is now restored.

The Scottish brass that is probably next in chronological order is in Glasgow Cathedral. It bears to have been erected to mark the tombs of six knightly families of the noble house of Minto, and dates from 1605. It measures about 3 feet by 2 feet, and engraved on it is a figure in armour kneeling before the word "Jehovah," inscribed in Hebrew characters and surrounded by clouds and rays. In St. Nicholas's Church, Aberdeen, the same church which possesses the Irvine brass, is one in memory of Dr. Duncan Liddel, who died 1613. In the upper part of the brass is the figure of a doctor of medicine, presumably a portrait of Liddel, seated in a library, at a table, with his books and instruments around him, and the customary skull before him. In an upper corner of the brass are the arms of Liddel; argent, on a bend sinister between a mastiff's head in chief, and a greyhound's head in base couped gules, three stars of the field, and in the lower part of the plate is a Latin inscription in Roman capitals. Mr. Davidson, Aberdeen, has sent a rubbing of this brass, No. 1,133, to the exhibition. No country was ever so rich in brasses as was England. While on the Continent there are very few brasses now to be seen, England, after suffering the most extensive and protracted plundering, both official and private, can still show about 4,000. The Edinburgh Museum of Science and Art possesses a valuable collection of rubbings of these brasses, and also a few continental specimens. Owing to want of the great space required, they have not yet been permanently placed on view in the Museum; but, by the courtesy of the director and the kind aid of his staff, a selection is now shown in the Heraldic Exhibition of some of the more distinctively heraldic of them; of rubbings the details of which could most easily be seen at the necessarily lofty position there assigned to them. This selection has been arranged in an order as strictly chronological as the space available permitted. Several are of historical, as well as heraldic and artistic, interest. Take, for example, No. 1,109. This rubbing is from the brass on an altar tomb in Westminster Abbey, in memory of Alianore de Bohun, who died in 1399. She was the widow of the murdered Duke of Gloucester, the "plain, well-meaning soul" of Shakespeare, and eldest daughter and co-heiress of Humphrey, Earl of Hereford. She is in a widow's dress. Her head rests on a blue enamelled and richly-diapered cushion, which in turn rests crossways on a similar cushion in red. Cushions and tilting helms under the heads of effigies, and dogs, &c., under their feet, have a curious effect when the rubbing is hung on a wall, but appear quite natural on the original recumbent brass. From the columns of the De Bohun canopy, which is Gothic, with clustered pinnacles, hang the shields of arms which indicate her own and her husband's descent. Of these the Duke's coat, consisting of the fleurs-de-lys and English leopards of Edward III. within a bordure, will be immediately recognised. The next number (1,110) is from a brass in Warwick, which as a work of art is recognised to be "in the very foremost rank of this species of monumental memorial"—that of Thomas, Earl of Warwick, who died in 1401, and his Countess Margaret, died 1406, daughter of Lord Ferrers of Groby. "Armed at all points in the style characteristic of the stirring times in which he bore such a distinguished part, this formidable baron appears," says Boutell, "attired with splendour suited to his rank and importance." His armour and offensive weapons are all finely-wrought and richly ornamented. Over his coat of mail he wears a jupon emblazoned with his arms. These Boutell blazons as gules, a fesse between six crosses crosslet or; from the rubbing, however, they appear to be seven crosses bottonnée, three, one and three. The Countess is in kirtle and mantle. On the kirtle are her paternal arms of Ferrers, seven mascles, three, three and one; while her mantle is embroidered with the arms of her husband. "On both effigies," says Boutell, "the heraldic charges are wrought with an elaborate diaper;" in addition to which "the effigy of the knight is pounced repeatedly with the ragged staff, the celebrated badge of the House of Warwick, and his feet rest on a chained bear, another ancient cognisance of his family."

The next exhibit, No. 1,111, has an additional interest. The enamels of the knight's jupon have been restored, so that it is believed to give now a more correct idea than is afforded by most brasses in their present state of the original magnificence of these memorials. It is a rubbing from the brass of Sir William Bagot and his wife. His jupon exhibits argent between three martlets, sable, on a cheveron gules, a crescent of the first for difference. The countess, whose head rests on cushions, wears over her kirtle a peculiar garment called a sideless cote-hardi, and over both a fur-lined mantle. None of these are heraldic, but both she and her husband wear collars of SS. Sir William, who died in 1407, is best known to fame as a *persona dramatis* in Shakespeare's play of "Richard II.," and it is curious to find his and his lady's effigies invested with the collar which was the badge of Lancastrian favour. It was instituted as a national order by Henry IV. (Bolingbroke), in allusion most likely to his motto "Souveraigne," but, perhaps, as the family collar previously worn when John of Gaunt was Seneschal. It consisted of golden SS either on a band of blue, or attached to each other by gold links, the ends in both cases being fastened together in front by a clasp. The collar as worn at the present day by kings-of-arms is of the latter pattern, and may be seen—No. 709 (1)—in the glass case in the centre of the same room in the exhibition which contains the rubbings.

Were the artistic aspects of brasses, their authorship, and their faithful chronicling of the minutest changes in the fashions of armour the objects of this notice, the rubbing (No. 1,112) from the brass at Little Horkesley, Essex, in memory of the Swynbornes, might furnish an admirable text. Sir Robert, the father, who died in 1391, is attired in a shirt of mail and jupon, with a camail hanging from his bascinet to cover his throat, and his sword-belt is transverse across the hips. Sir Thomas, who survived till 1412, wears instead the newly-invented cuirass and steel gorget, and his sword-belt hangs diagonally from his waist. The palettes in front of his arm-pits are enamelled with the cross of St. George. He is invested with the collar of SS, and wears no jupon to conceal the fact that he is in plate-armour. Sir Robert's sword-belt, with R. and S. alternated on it, is a good instance of initials used as a personal decoration, while on the buckle is an early example of the somewhat rare use of a monogram. The canopy, with its beautiful arches, clustered pinnacles and pendant shields, illustrates the minute acquaintance with church architecture possessed by the designers of brasses.

No. 1,113 is from the brass at Long Melford, Suffolk, in memory of Margaret Faunceyes (*d.* 1424), wife of William de Clopton. The heraldry on her costume, like that on Lady Warwick's (No. 1,110), is arranged symbolically, it is suggested, of what, in English law, is termed her coverture. On her kirtle are the arms of her maiden name—a saltire between four crosses. Covering this is her mantle, bearing the arms of her husband—a bend between two indented cotises. This fashion is abandoned in the Verney brass of the next century at Aldbury, Herefordshire (see No. 1,125), where, while the knight's tabard bears his arms alone, the lady's mantle bears them with her paternal arms of Bray, impaled. On No. 1,114, from an English brass at Hever, in Kent, the lady's head is on a cushion, supported by angels, probably in allusion to the flight of the soul. Her husband's shield is placed at the top of the slab. The practice was early adopted of separating the shield from the wearer and placing it, according to the artistic ideas of the designer, at the corner of the slab or at the top or foot, &c., as in Nos. 1,108, 1,114, 1,117 and 1,118 respectively. Sometimes, for decorative reasons, the same shield is repeated at different places, as in No. 1,113. But the plan was specially convenient when, for a genealogical purpose, more than one coat was introduced, as in the Swynborne, De Bohun, Clopton, or Neville (No. 1,128) brasses. Finally, the shield sometimes appeared alone in company with an inscription, as in the Scottish brasses before mentioned, or the Oxfordshire brass, represented by No. 1,131, which consists of two coats-of-arms,

and under them respectively only the names "Thomas Whorwood, 1634," and "Elizabeth Whorwood, 1633." Another example of a brass somewhat similar in this respect is the Strafford brass in York Minster, a rubbing of which is contributed by Mr. C. S. S. Johnston (No. 1,148).

For a long period heraldic ensigns were denied to persons engaged in trade. But merchants used trade-marks which served much the same purpose. A specimen of a mark is shown on the rubbing (No. 1,116) of the brass in which Reginald Spicer, merchant in Cirencester (*d.* 1442), appears in effigy, with his four wives standing all in a row. This mark, which is a variety of one very common among wool merchants, consists of a shield, on which lies, pale-ways, a charge somewhat like an archbishop's crozier, from the shaft of which, immediately under the cross-beam, fly two streamers towards the sinister side of the shield. Opposite, on the dexter side, is a small semicircle drawn from a centre in the shaft. At the nombril point the shaft intersects a circle, and in base a line fesse-ways couped at the ends. Spicer's initials, R.S., in old English capitals, flank the central charge, the cross and streamers of which are supposed to have been adopted in allusion to the Agnus Dei. In time, however, merchants were granted coats-of-arms, and these appear on their brasses, sometimes along with their merchants' marks, sometimes alone. The shields on the brass (No. 1,126) of Nickolas Leveson, mercer, merchant of the staple of Calais and Sheriff of London (*d.* 1539), are a good instance of this.

The humble little brass at Wimborne, Dorset, of which No. 1,118 is a rubbing, is no other than the only brass in England erected in memory of a king. It represents in half effigy Saint Ethelred, king of the West Saxons, who in 872, or, according to the inscription, 873, was martyred, "Per manus Dacorum paganorum occubuit." He is represented close-shaven, crowned and sceptred, and in tunic with close sleeves, cloak or cope, and ermine tippet—garments which signified that the king at his coronation was admitted to an office both civil and sacred in character. Underneath the inscription is a shield charged with a cross fleury. This brass, though commemorating a personage of the ninth century, is pronounced by Haines to be of fifteenth-century workmanship, with the inscription restored about the end of the sixteenth. But who can wag the head and call this tribute tardy? William Wallace was born in the thirteenth century, Herman flourished in the eighth, yet their monuments have only been erected in the latter half of the nineteenth.

The close-fitting jupon had probably been designed to contribute to the physical warmth of the warrior, whose armour consisted merely of mail. It certainly was discarded when the cuirass was introduced, and a tabard, a looser garment with short cape-like sleeves, was adopted in its place. Instances of the tabard may be seen on Nos. 1,119-21, &c. As a rule it was heraldic, with the bearings repeated four times on it, viz. on the front and back and each sleeve. In this context the tabards of the kings-of-arms, heralds and pursuivants exhibited (Nos. 141-46) in the large wall case in the same room with the rubbings may be inspected. In the mural Denys brass at Olveston, Gloucestershire, A.D. 1505 (No. 1,119), are two kneeling figures in plate armour and tabards, the charges on which are repeated on two of the four shields which are placed in the corners of the slab. No. 1,120, from a recumbent brass in Childwell Church, Manchester, represents Henry Norris, of Speke, in a tabard over his armour, and with his head resting on his tilting helm. The next rubbing (No. 1,121), from a mural brass at Thame, Oxfordshire, represents Sir John Clerk, of North Weston, died 1539; and the inscription relates that at a tourney at Bomy, in France, he made prisoner Louis of Orleans, Duke of Longueville. No. 1,124, from the brass at Hever, in Kent, in memory of the father of Queen Anne (Boleyn), Sir Thomas Bullen, Earl of Wiltscher and Ormunde, who died 1538, is worthy of notice. The brass is said to be the work of a provincial, perhaps a Norfolk, artist, a theory which, though interesting from an art point of view, does not impugn its heraldic importance. The Earl is represented in a complete suit of plate armour, with his head, on which is his coronet, resting on his crested tilting helm. Over his armour are the full insignia of the Order of the Garter, the robe with the badge embroidered on the left breast, the hood, the collar, and below the left knee the garter itself. The collar and garter may be compared with the collar and garter of the present day exhibited in the case in the centre of the room. The most obvious difference between them is the larger scale of the garter-encircled roses of the older collar. The hood appears to be very similar to that which forms part of the costume of the Order to-day.

Rubbings of the upper parts of two fine brasses which, though of English personages, have all the characteristics of Flemish work, are also exhibited (Nos. 1,127 and 1,195.) The former is from Cornwall, which, owing perhaps to its foreign trade, was rich in foreign brasses. It consists of the upper part of the effigy of a man in armour, of a date probably about 1450. On his jupon are three crescents surmounted by a bendlet. His head, which is bare, rests on what appears to be a shield richly diapered and supported by angels. The latter (No. 1,195) is supposed to be part of the brass of an abbot of St. Albans, and is pronounced by Boutell to be "the very finest specimen of this class of monument known to be in existence." The Museum contributes also rubbings from three important foreign brasses, the originals of which are in the Dom at Freiburg, Saxony. They commemorate respectively Princess Sibylla Elizabeth (*d.* 1606), wife of Duke John George of Saxony (No. 1,151); her son, Christian Albert (*d.* 1612) (No. 1,149); and the Abbess Dorothea of Quedlinburg (*d.* 1617) (No. 1,150). Their heraldic interest to us consists in the manner in which the coats-of-arms are disposed around their margins.

Modern brasses do not come within the scope of this notice; but there are such things. Some are too fanciful and some too prosaic. Still, some are good, and the art of engraving in brass cannot be said to be a lost art. In these days of church restoration, the appreciation of this ancient form of memorial appears likely to continue to revive. It still remains to be seen whether in conception or execution of new brasses the moderns will equal the ancients, but there is one office in which it is to be hoped we will excel our forefathers, both recent and remote—that of reverently conserving the remnant of the ancient brasses which has survived till our day.

COUNTY MUSEUMS.

IN a letter to the *Times*, Sir Harry Verney writes:—I desire to bring before the landowners and others interested in the welfare of Buckinghamshire, and, I venture to add, all who are willing to aid, the desirability of founding a museum and library in the county, and to make an earnest effort for that object. Sixty-four years ago I appealed to the then Duke of Buckingham, to the landowners and others interested in the welfare of the county, and was so fortunate as to obtain contributions for founding a county infirmary. Dr. Lee, of Hartwell, gave 1,000*l.*; several members of Lord Carrington's family gave each 100*l.*; Mr. Robert Ceely, of Aylesbury, contributed his invaluable medical skill and knowledge, with his urgent advice to persevere notwithstanding great difficulties; Mr. Heyward, a schoolmaster, gave his unpaid services as secretary for twenty years. Encouraged by these and other recollections of the generosity and public spirit of the county, I do not doubt that such a movement as I now advocate would, if once started, be liberally supported. Buckinghamshire is rich in historical recollections and in the number of its parish churches of great architectural beauty and antiquarian interest. Hillesden Church made Sir Gilbert Scott an architect, and the excellent work done by the Bucks Archæological Society has served to draw attention to the objects of interest in our midst. But we have no central institution or building in which historical relics can be received and preserved, or any public collection which would excite the interest of the young, or offer the means of instruction to those desirous of studying the history of their own county. Such museums have been started with great success in other counties, for instance, notably in Wiltshire. Engravings, drawings and photographs of old buildings, old county maps and descriptive books, rubbings from brasses in churches, pottery, coins, arms, relics of Roman times and the civil wars, autograph letters from old county worthies, copies of interesting old parish registers, wills and deeds, manuscripts and books illustrating the history of the county and the lives of illustrious Bucks men, would all find their fitting home in such an institution. Another portion of it would be devoted to illustrating the arts and industries of the county, from the lacemaking introduced by Queen Catherine of Aragon to the latest development of the railway industry at Wolverton, and specimens of wild animals, birds, insects and flowers, and of the various soils and minerals would there all find a place. Were such a museum established, I have no doubt that private liberality would soon cause it to be well filled. There are many treasures buried in private houses and much information known only to individuals which could thus become public property, to the great advantage of the community. The first step, that of obtaining a site and erecting a building capable of extension, is the most difficult and the most important. I mention a contribution that I shall be ready to make if funds can be collected to obtain a site and erect a building. I have myself a small collection of objects, collected by myself during journeys in various countries, which I would gladly give to a county museum, and I would also contribute a sum of money if the scheme is generally taken up.

Professor Flower, commenting on the foregoing, says:—

The letter of the venerable Sir Harry Verney deserves careful consideration, as it is of importance not only to the interesting county to which it relates (of which I am at present a temporary inhabitant), but to very many other districts of the kingdom. In a recent tour through Holland I was much struck by the development that has lately taken place in all the im-

portant towns of municipal museums, devoted solely to illustrate the history of the town and of its most notable citizens. Old portraits and pictures of buildings, plans and maps, documents, relics of battles and sieges, banners, costumes and other indications of manners and customs long passed away, standard weights and measures used at various periods, and many similar objects, all carefully preserved and well-arranged and labelled, make these museums a mine of information to the historian and archæologist. The only pity is that they were not begun long ago, before the hand of time had destroyed so much that can now never be replaced. Sir Harry Verney's suggestion goes beyond these municipal institutions, and would include also "specimens of the wild animals, birds, insects and flowers, and of the various soils and minerals"—in fact, the "natural history" of the district. This would undoubtedly give a much broader basis of interest and support. Unfortunately, in the last paragraph of his letter a sentence occurs which is quite inconsistent with the general excellence of his scheme, and shows that his public spirit and generosity have for the moment outrun the practical wisdom shown in the rest of the letter. He says, "I have a small collection of objects, collected by myself during journeys in various countries, which I would gladly give to a county museum." Here we have at once an opening for the kind of institution of which too many exist already, the appropriate inscription on the door of which would be, "Rubbish may be shot here." Not that the objects contained in them are necessarily rubbish in themselves, but that they have become so under the imperfect arrangement and in the incongruous surroundings in which they find themselves in such a place. The first element of success in a museum is that its object be definite and limited. The illustration of the social and natural history of a county affords a very practical definition and limit. To this may be added, when the circumstances are favourable to carrying it out satisfactorily, a general collection of an educational character, also strictly definite and limited in its objects, and kept perfectly distinct from the other. These principles have been for many years recognised and carried out in several important centres in this country; it might be invidious in me to mention any by name; but want of means has generally prevented their being fully developed. In these days, when enormous sums are annually spent with universal consent on almost every kind of educational object, it is strange how little is as yet thought of the powerful influence in teaching that a well-arranged museum may afford. As attention appears now to be awakening to the subject, it may be desirable to repeat the warning that I have had occasion to give elsewhere—that the building, though certainly one requisite for a museum, is in itself of no more value than a church without its ministers, or a school without its teachers. A staff of skilful and intelligent curators must also be provided. We shall never have local museums doing the work they might accomplish in the educational machinery of the country until the curatorships of such institutions, instead of being so poorly remunerated as they are at present, come to be looked upon as objects of ambition for well-educated, specially trained and cultivated men, though in writing this word I do not see why I should not add, or women.

ST. MARY'S TOWER, MANCHESTER.

THE proposed removal of the tower, which was allowed to remain when the body of the church of St. Mary, Manchester, was removed by the Corporation, has caused Mr. Waterhouse to write the following letter:—

Why should the tower of St. Mary's be doomed to destruction? If kept it would be to Manchester what the tower of St. Jacques in the Rue de Rivoli is to Paris, a memorial of the past, adding to the interest and picturesqueness of the garden which surrounds it, and a reminder in the midst of the rush and worry of to-day of the comparative calm and peace of yesterday. Manchester has unfortunately not too many of such reminders left her to conserve. Your Corporation is so proverbial for its intelligence and good sense, that I feel sure it must have some good reasons for being so unanimous in favour of the destruction of the tower; and I venture to hope it will give clear expression to those reasons when the Council meet to confirm the decision of the Parks Committee on Wednesday next, and that those reasons may be recognised as sufficient; otherwise I fear her great municipal institutions, of which Manchester is so justly proud, will suffer in the eyes of that increasing class to whom old things are dear, and, in fact, almost beyond price. It is not only that the tower of St. Mary's is in itself a stately bit of architecture, with a fine view from the top. Its structure is positively unique and mysterious, from the fact that the belfry is of a style two or three centuries earlier than the lower and upper parts of the tower, leading one to suppose that the Gothic work had formed part of some earlier pre-Reformation church. I venture to think that this element of mystery is another reason for not ruthlessly parting with the tower. My brother-architects will, I believe, find evidence in the tracery of the belfry windows of the cusps having been chiselled away, probably when the tower of St. Mary's was built, so as to bring the Gothic work a little more into harmony with the Classic severities above and below it. If my conjecture be correct that this part of the tower formed part of some earlier church, ministering to the spiritual needs of Manchester before St. Ann's or St. Mary's was thought of, what was the church and where did it stand? Probably those learned in the early history of the city could throw some light on this problem. A generous offer has, I understand, been made to relieve the Corporation from all expense with relation to the tower if it be allowed to stand for another year. Surely the Corporation will not lightly refuse such an offer.

ARCHÆOLOGICAL LAW IN ITALY.

IT will be a satisfaction to those interested in art to learn that the Minister of Public Instruction will present a new law on the subject of the tenure of works of art and antiquity. The law at present, says the *Times* correspondent, is a legacy of the past state of the Italian political organisation, each of the old states retaining its law of days prior to their union in the present kingdom. In Rome the Pacca edict is in vogue; in Florence there is another law; in Naples a decree of the Bourbons; and in the ex-Austrian States one more liberal than either of the others. The Pacca law permits the exportation of works of art only on the permission of the Government, and on payment of an export duty of 20 per cent., the authorities having the right to refuse permission in any case without the alternative obligation of purchase, while the Austrian law makes permission to export the alternative of refusal on the part of the Government to purchase. The financial straits to which some of the great families of Rome are reduced, and the injustice of forbidding them to sell the pictures which are their greatest wealth, in order to enable them to meet their obligations, have brought to light the absurdity of the system most forcibly, and a law has been drafted to correct it. This establishes a uniform law for the whole kingdom, permitting alienation and exportation of all works of art or objects of antiquarian interest which the Government, within three months after due notice by the owner, shall not have determined to purchase at a fair valuation, an export duty estimated at about 10 per cent. being levied and devoted to the purchase of such works of art as the Government shall wish to acquire. The same law provides that duplicate works of art discovered in official excavations which are not required for the completion of the national collections may be exchangeable with foreign museums and institutions.

GREEK INFLUENCE IN EUROPE.

AT the Congress of Orientalists, which was held in the Hall of the Inner Temple, M. Gennadius, the Greek Minister, delivered an address in which he said:—Greece is the one country and the Greek nation is the people which from prehistoric times to this day serves as an indispensable bridge between the East and the West. Having had their cradle in the East, and still retaining in their language, their traditions and their philosophy an Oriental background, they are nevertheless the soul and embodiment of Western thought—of that European genius which blossomed forth in them first in its most captivating beauty—that ever new and irresistible impulse which is called progress. From the moment that Greece appears on the stage of the world's history, this mighty force comes into play, actuated by the two chief traits of the Greek mind—by the sense of individuality and by the love of freedom—qualities hitherto unknown, which seem to emerge from the very soil of Greece, as the Greeks considered themselves to have sprung from the earth. Thus armed, the Greeks at once come in contact and join issue with Asia. They are the first who venture to fathom her mysteries, to unravel her symbolism and to grapple with her learning. Greece encounters Asia already mature in the development of its Eastern civilisation, and finds herself face to face with the huge power of Asiatic despotism, its barbaric glitter and its dumb and apathetic inertness. The Eastern mind generally loves to grope about in a region of dimness, is content with doubts and is mystified by religious contemplations, deeming it impious to inquire into the relations of God and man, and is filled with awe at the consideration of nature. The Greek, with the open-eyed delight of a child, faces nature boldly, and seeks to wrest her secrets from her; nature has no mystic terrors for him; he breaks her silence; and it is in Asiatic Ionia that the Greek mind first conceives the idea—diametrically opposed as it is to Eastern thought—that there are fixed laws which govern nature. Therefore "Know thyself" is the first law in life which the Greek—in opposition to the Asiatic—sets to himself; and to this law literature, arts, politics, religion itself conform. It is the watchword of a fearless intellect, the first step towards knowing the world rightly. This love of

inquiry and of positive knowledge, as opposed to the contemplation, the doubt and sluggish indifferentism of Asia, is personified by Odysseus, that truly typical Greek, who "had seen the abodes and had learned the minds of many men," who loved to wander over the world, and who delighted in his own adventures. Odysseus was the earliest of great travellers, and the boldest of explorers. Herodotus, himself an Asiatic Greek, first reveals to the world, by scientific inquiry and in a systematic history, the religious, political and artistic life of Asia and Egypt. His nine books have remained and will remain the most reliable and most complete storehouse of Oriental lore. They are the imperishable monument of the victory of the genius of Greece over that of Asia. This is not the place to refer to the struggle which Greece, from her first appearance as a nation, has continued to wage against the East, doing service as a bulwark to the West. But, when we look to the field of the arts, of politics and of religion, we find the genius of Greece takes its start from Oriental sources, only to transform its prototypes completely and soar up to all but unattainable heights. The art of Egypt, having been the outcome of a priestly domination, was an art of the dead, stillborn and conventional; size, not grace and symmetry, being its merit. That of Assyria, on the other hand, laboured under the crushing weight of a secular despotism which kept its tone low, and narrowed down its horizon. Greek art, emerging from the thraldom of Asia, was guided by the idea that reason should not be divorced from beauty, but that the beautiful should also be true to nature. With a bold yet measured grace the Greek modelled his gods, not after beasts and monsters, but after an idealised human form. In political life, again, the East had not then known a medium condition between despotism and anarchy. But the pliant genius of Greece first made the effort to reconcile the rights and the duties of the State to those of the individual. With regard to religion, the priesthood in the East overmastered every phase of social and intellectual life; the art of writing itself was a hieratic secret, and the study of literature and science belonged to the priestly office. The Greeks, having received with the alphabet their earliest mythology from Asia, soon threw off sacerdotal influence, and priesthood never constituted a caste in Greece. Although polytheism was the religion of Greece, yet her earliest poetry clearly pointed to higher religious conceptions, while her philosophy, ruthlessly overturning every mythological fiction, produced the teaching of Socrates, which falls but little short of that of Christ. Thus purged and prepared, by the application of a clear and fearless intellect to every branch of human knowledge, Greek genius was ready to render its greatest service to the world by receiving again from the East and interpreting to the West the Revelation of Christ. The Jews, the only Asiatic race which escaped despotism by adopting theocracy, were the people amongst whom the teaching of Christ could first be promulgated. But the Greek language was alone able, by reason of its inimitable subtlety, to give adequate expression to the noblest thoughts of the Christian faith. The Apostles, starting from Asia, wrote the New Testament in Greek, and the Greek Fathers, versed in the philosophy of Plato and Aristotle, expounded in an abiding manner the dogmas of Christianity. Such is the rich and imperishable legacy which the contact of Greece with the East has left to humanity, and so overspanning, universal and continuous are the benefits derived from it that we may well say with Shelley, "We are all Greeks; our laws, our literature, our religion, our art have their roots in Greece." The consideration of these questions, of the transmutation, through the agency of Greece, of Asiatic into European civilisation, forms part of the labours of this important congress, which now befittingly meets in this home and temple of the law; in this great and hospitable capital of the Empress of the Seas, whose possessions reach from pole to pole, and extend from one hemisphere to the other; who is the noble mother of many nations and the founder of flourishing states all over the East; whose mighty Asiatic Empire far exceeds in extent, riches and power the fondest dreams of Eastern potentates; and whose benign and beneficent rule confers on the world blessings even as great as those still derived from the undimmed brightness of the glory of Greece herself.

Correspondence

The Excursion of the Society of Architects.

SIR,—The success of the visit of the Society of Architects to Belgium has been so marked that it is proposed to make it one of a series to various parts of the Continent. It is difficult to understand why such specially favourable opportunities of studying architecture have hitherto been neglected by societies of practising architects. It is only for such specially-organised expeditions that many facilities can be obtained for the inspection and sketching of very many architectural works, as well as of productions of the allied arts and sciences; besides which, men in practice are naturally more discriminating than younger students as to what examples will be most valuable to them and more able to assimilate the useful matter they collect. The treasuries of domestic and civil architecture, both Gothic and Renaissance, in Belgium are by no means exhausted, in spite of the fact that one can trace the inspiration of nearly all our best modern buildings (of these classes) to this source, and the careful and copious notes and sketches made by the various members of the Society during the past fortnight cannot but have not only a powerful educational effect upon these gentlemen personally, but must also contribute to improve English architecture, especially in the provinces, which is so largely represented in the Society's ranks. Shall we be considered too sanguine if we entertain a hope, moreover, that our production in England of a vital and vigorous revival of picturesque and refined architecture may before long react upon modern continental work, which, alas! with the exception of a few notable examples, is still a lifeless art owing to their too great devotion to the spirit of classicism?—I am sir, yours faithfully, W. H. SETH-SMITH.

46 Lincoln's Inn Fields: Sept. 2, 1891.

Westminster Abbey Extension.

SIR,—When in March 1889 I ventured to propose as an unobjectionable solution of this difficult problem the construction of a cryptal chapel under the Abbey Green or vacant land north of the nave, my only difficulty in justifying the suggestion was in showing that there need be no difficulty as to facility of access, provided a staircase on the noblest scale and architectural character were allowed to form part of the design. There was some boldness in this proposition, ancient Gothic staircases being, with one or two exceptions, small, dark and inconvenient. I was, therefore, unable to get much support from Gothic examples, and had to content myself with saying, "The sufficient Mediæval authority for such a feature exists at Canterbury;" but later on (February 1891) I referred to a few other examples.

I have just met with another which, considering the period, is of such striking architectural design that I dare say you will be glad to publish a description of it. It occurs at Hexham Abbey, and consists of a stone staircase open to the south transept, which was used by the monks when they descended from their dormitory for their periodical services. As they came down, step by step, they would see the shrines and effigies of Wilfrid, Acca and other saints, the oratory of Prior Richard, the great screen painted with Death's Dance and the sculptured altar, not dimmed and darkened as we see them, but nearer to the condition in which they left the hands of the artists who embodied their thoughts in them. It still affords a coign of vantage, whence the noble proportions of this fine work of our forefathers can be conveniently surveyed.

The whole paper "On the Staircase," in *Chambers's Journal* for this month, is worth reading.—Yours truly,

Buckleigh Road, South Streatham: August 31. H. TRAVIS.

GENERAL.

Sir Henry Wood will start to-morrow for Chicago, in order to make arrangements in connection with the British Section of the World's Fair.

Mr. Holman Hunt's *Triumph of the Innocents* has been definitely secured for the Liverpool Art Gallery through the exertions of Mr. Harold Rathbone.

The Autumn Exhibition of Pictures was opened on Monday in the Manchester City Art Gallery.

The Annual Meeting of the Province of Quebec Association of Architects is to be held in Quebec on the 8th inst.

The Chelmsford Town Council have appointed Mr. G. H. Sasse, of Tendring Hundred, surveyor. There were 101 applicants for the post.

Mr. Woodall, C.E., has been appointed by the Manchester City Council engineer to carry out the arrangements in connection with the hydraulic power scheme. The execution of the works will take about fourteen or fifteen months, it is expected.

The Athenæum Club has been decorated under the direction of Mr. Alma-Tadema and Mr. Poynter. The walls of the hall and staircase are panelled with a high dado of beautifully-coloured marbles; the pillars are painted ivory white, with gilt capitals, and the panelled and arched ceiling of the hall is adorned with classical decorations, for which Mr. Alma-Tadema drew the designs. The figure of the Apollo Belvidere over the clock has been gilt.

The late Signor Benedetto Romagnani, of Pistoria, Florence, who recently died, has left to the Corporation of the City of London a legacy, consisting of "the centre of a chandelier for the saloons of vessels, composed of six parts, and decorated in the middle with the Triumph of Neptune and other ornaments."

The Architect.

THE WEEK.

An inquiry instituted by the Local Government Board has taken place in Darlington, and no doubt the inspector will advise the Board not to sanction the application of the Town Council for leave to borrow 4,000*l.* in order to expend the money on an extension of the Town Hall. The proposal is a remarkable example of the penny-wise-and-pound-foolish policy. There is no doubt the present building is inadequate for the administration of an important town like Darlington, and it will be more so as time runs on. The Town Council propose an unsightly addition of over 60 feet, and they are not quite sure whether any money will be left for the furnishing. The addition would give more accommodation to the councillors, but many of the officers would still have to put up with their present offices. It is admitted that the new building would only serve a temporary purpose, and for all we know it may be erected to convince people of the necessity of new Municipal Buildings. But 4,000*l.* is too large a sum to throw away on a structure that is to be removed. If Darlington cannot pay the interest on the money that would be needed for suitable Municipal Offices, it would be better for the town councillors to suffer some little inconvenience until the place is richer. At all events, we hope the Local Government Board will not allow an outlay of 4,000*l.* on a building that would not be worthy of a village.

A correspondent of the *Glasgow Evening News* writes:—"Three Glasgow architects—Skirving, Ewan and Robinson—are about as indignant as any men can be just now, and I will tell you why. A little while ago they were invited, as was stated in our columns at the time, to send in competitive plans for the new Glenburn Hydropathic at Rothesay, it being distinctly understood that the competition was limited to these three, and that one or other would be appointed architect. Plans were duly prepared and submitted to the directors of the Hydropathic, and it was then discovered that certain other architects had voluntarily sent in designs, without, if I am rightly informed, so much as asking 'by your leave.' The plans received were examined and considered, and finally those of one of the outsiders were adopted as the most suitable. No explanation of any kind has been offered to the three Glasgow men who entered the competition on the conditions above stated, and they may go and fetch their plans back to their offices as soon as they choose. Messrs. Skirving, Ewan and Robinson are convinced that they have been rather shabbily treated, and I am not surprised at their indignation." The grievances of competitions were numerous enough, but the Glenburn case adds a new variety which probably will be often followed. It is the more remarkable as coming from Scottish architects, who were supposed to let every man enjoy his chance.

At the Congress of Orientalists on Wednesday, Dr. J. S. Phené read a paper on the Hittite monuments. He maintained that there was every reason to suppose the figures at Nymphi were those of the Egyptian king, Rameses II., known also as Rameses the Great, and also as Rameses-Sesostris, although "Sesostris" was not found on his monuments; and was, perhaps, a family name. Dr. Phené gave his own reading of the symbols at Nymphi:—The symbols are a crouching bird on a level with the face of the victorious Sesostris, and close to it a sceptre; above it a sign frequently found in Hittite inscriptions of a staff with smaller ones on each side, which symbol he considered was equivalent to the people, *i.e.* of high and low degree; and following this a broken sceptre. The bird usually found in Hittite inscriptions, as at Jerabis, is the eagle, and the position is one of majesty, which he considered implied kingly power, and hence the crouching and humbled bird was a king bereft of his power. The metaphor was purely Oriental, and in continual use in the Hebrew writings—"a bird of the air shall tell the matter"—"mine enemies chased me like a bird"—"they shall tremble as a bird out of Egypt," meaning, clearly, escaped from the crushing power of Egypt. The broken reed or sceptre was also continually used as a sign of weakened power, so that, reading from right to left, the symbols read, the bird announces to the conqueror—"The sceptre, great conqueror, is yours;" "Great and small (*i.e.* the nobles and people) follow; the sceptre of the vanquished is broken." Several other of Dr. Phené's readings, as of the inscription on Mount Sipylus, were given, as very strongly supporting the views of Mr. Dennis as to this sculpture being the goddess Cybele and not Niobe, and Dr. Phené produced a mace procured by him in Sivas, the head of which was the same symbol as appeared in the inscription near the figure, showing the perpetuation of design even when the meaning had passed away. The author further expressed his opinion that the figures at Iasili Kaïa, &c., were older than the Assyrian sculptures, and that in them were the ideas carried out in Assyrian art, the figures standing upon the animal forms in the Hittite carvings being finally combined with the animals in the Assyrian work. Dr. Phené's attention was, however, more engaged with a remarkable Cyclopean temple on the Star mountain, near Tokat, than with the rock sculptures, which, when he visited them, were generally considered as a low class of Assyrian or Persian art. One of the most important points of this journey had been the investigation of Cyclopean buildings, and this grandly-elevated temple, which was semicircular in form, corresponded exactly with others he had found, one of which was in the centre of the island of Minorca. The one in Anatolia, which he considered was the great temple of the district, was in the locality of the most remarkable Hittite sculptures. It was on the most westerly and the largest of a number of mounds, running from east to west, in a serpentine course.

A competition among water-colour artists is to be held next year in Evreux, but it will be restricted to artists who belong to the district. All classes of work will be eligible, and it is not necessary to frame the drawings. A jury will examine the paintings, and the following prizes are to be awarded, viz. two of 100 frs. or two gold medals, five silver-gilt medals, five silver medals, twelve bronze medals. If the number of meritorious works exceeds anticipations more medals will be distributed. The competition is got up by the Société des Amis des Arts de l'Eure, and is therefore safe. The committee will endeavour to promote the sale of the drawings, charging, however, 10 per cent. for the trouble. The scheme denotes that interest in water-colours is extending in France.

The Comte de Paris could hardly exhibit himself as a litigant in France, and must accordingly sacrifice the opportunity that will soon be offered to him, and which is one that gives delight to lawyers. A nobleman of Perigord, the Marquis de Saint-Astier, was a believer in the feudal virtues, and when he died a few months ago he bequeathed his movable and immovable property save and except two classes to the Comte de Paris. The exceptions were his books and pictures, which he left to the town of Perigueux. There seems to be no difficulty about the books—nobody could consider them to be anything but written and printed pages—but the pictures at once formed a case for the lawyers. In two rooms there were altogether forty-nine, of which eleven were placed on the floor. The legal intellect immediately began to seek out some grave reason for such a disposition. It was too rational to suppose that the pictures were deposited on the floor because there was no suitable positions for them on the walls. The conclusion drawn was that the eleven pictures were not pictures, but formed part of the furniture, which was also supported by the flooring. Until the question is decided by the Comte de Paris or the courts, the eleven pictures, which are the most valuable part of the gift, will not be made over to the people of Perigueux. As there is no interest in a legal sense about the remaining works which are hung in a commonplace manner upon the walls, the legatees are indifferent to them. The affair is such a subject as would have suited that other Perigordian gentleman, Michel de Montaigne, for a discursive essay.

A BUILDING PROBLEM IN STRASBOURG.

AFTER passing beneath mountains and along the sides of them, most of the railway lines that lead to Strasbourg have to cross a vast plain, and the great spire of the cathedral is therefore visible for several miles. The building would be more symmetrical if the second tower did not terminate with the platform which is known to all visitors, but when seen from afar one spire seems to be sufficient as an indicator. It is only from some points of view that the spireless tower is perceptible, and then we can think with a fellow-feeling of Master ERWIN of Steinbach, and how much better the building must have appeared if his design had been faithfully worked out. As it is, the spire, from its great height, which is not as yet surpassed by any chimneys or towers in the city, does help us to imagine the thankfulness with which many a traveller in old days was filled at the first sight of such a beacon. He knew he was approaching a secure city, and was safe for a time at least from the land thieves and water thieves of that country. Strasbourg was more than the seat of a bishop; it might even be considered as a free city, for after many tough contests the inhabitants gained control of their own affairs, municipal as well as private.

At the present time, although the spire still points heavenwards, there is not much satisfaction visible in the faces of men whose journey to Strasbourg is coming to an end. Many of those who are natives reveal by their expression an apprehension of evils awaiting them. Who can tell whether reports of unguarded speeches may not have preceded them, or that the manner of going through the ordeal at the boundary a few hours earlier was not already recorded as a sign of disloyalty? And yet it seems incomprehensible to a stranger that any inhabitants of Strasbourg should be disaffected towards their new rulers (that is, if they could make allowance for over much display of domineering), or be yearning after French citizenship. The city, like its inhabitants, is essentially German. It was held by France for barely two centuries—for the conquest by CLOVIS in the fifth century can hardly be taken as evidence that Strasbourg should for ever form part of France. But brief as has been the French tenure, the people appear to be fascinated by it, as if it allowed an exemption from all onerous obligations.

The discontent which perplexes the relations between the inhabitants and the authorities gives a novel interest to Strasbourg at the present time. It is not enough to rule there in such a way that danger will be avoided; it is necessary to demonstrate also that the new rule brings prosperity to the people in spite of themselves. The Government must become paternal, assume novel responsibilities and initiate experiments at its own risk. There was a time when, if rigorous measures did not overcome the antagonism, many unreadable works would be produced to convince the citizens of Strasbourg that their altered condition was one of bliss. But the Germans have become too practical for that sort of reasoning, and they know that works can be far more impressive than words. Instead of hiring scribes to devise theories, they have employed builders, and are endeavouring to call a new Strasbourg into existence in order to confound the sulkiness of the old.

In consequence of so novel an experiment in government, a modern map of Strasbourg would be a surprise to any one who knew the city as it stood about twenty years ago. Like so many of the fortified places on the Continent, Strasbourg was not given to expansion. Having fortifications always around them the citizens naturally came to the conclusion that there was no safety outside their stone walls. From the time of the Romans until the thirteenth century the city did not extend beyond the island that is bounded by narrow streams, and in 1870 the size of Strasbourg was not more than double what it was in 1270. If the fortifications kept out enemies they also confined the people within narrow limits. The minds of the citizens seem also to have been kept in a state of inaction, for although the French wished to erect statues of famous natives they could only discover two, KLEBER, the general who was murdered in Egypt, and the mythic GUTENBERG. The works of SPECKLE and VAUBAN did not, however, save the city from capitulation when it was attacked under modern conditions of warfare, and it was therefore decided to provide against a siege in the uture by a new line of fortifications far outside those which the French were compelled to surrender. The area of the city in 1870 was subsequently more than doubled by means of measures that were primarily dictated by military necessity.

In England the owner of a building estate commonly begins by raising a church. The Germans started by erecting a palace for the Emperor, a group of University buildings, and various offices for administrative purposes. The sites selected were those lying nearest to the ancient town, and in course of time the Government institutions will stand, as it were, between the old dwellings and the new. In designing the buildings it was, we imagine, the aim of the architects to prove to the Alsatians that economy was a principle with the authorities. The palace is a substantial Renaissance building, but it would not satisfy a French monarch. It consists of two storeys above the ground floor. There is room in the Platz near the building for military exercises, and in order that they may be witnessed all the windows on the first floor are provided with capacious balconies. The portico is carried up to the cornice, in order that ample space may be obtained over the central entrance for the Emperor, Kings and Grand-dukes, whenever they are present, to witness military spectacles, for though Strasbourg does not form part of any of the States the whole of Germany is concerned in its welfare. The dome which surmounts the building is also turned to account for observation. It is square on plan, and the faces are in part open arches, in order to accommodate privileged spectators. The simplest peasant who visits the interior of the Kaiserpalast—it is open daily for five hours—must observe that the building was intended for public use. The part reserved for the imperial family would not be considered too luxurious for a gentleman of limited means in England. There is, however, no affectation of the asceticism which has been exhibited in the rooms of some great rulers and warriors; but if the camp-bed is absent, a plain brass bedstead from Birmingham is almost as simple. In fact, the imperial quarters are not unlike a few English rooms. The costliest parts are the salons for State assemblies, which are richly decorated with paintings that seem derived from French work of the eighteenth century. There is a general absence of the historic scenes, with figures of giants, which are so common in public buildings of Germany. The building was designed by Herr EGGERT, and, in spite of all the regard for economy, is said to have cost 250,000*l*. The University buildings are separated from the palace by the river. They are in better style. It was not necessary to break the repose of the architectural lines by escutcheons and other emblems of greatness, which are too plainly additions from without. The principal hall is of two storeys, all the windows having arched heads. Those on the first floor are separated by half-round Ionic pilasters. The frontage is about 400 feet in length. The central part and ends slightly project, and are carried somewhat higher than the remainder, but evidently it was desired that the length of the façade should be manifested. The building, which is the work of Professor WARTH, is admirably adapted for its use in connection with the administration of a modern university. The ancient universities taught the world by means of grammar, rhetoric, logic and mathematics. The new Strasbourg University has also four faculties: theology, law, philosophy and natural science. But as mathematics was made to include astronomy, music, arithmetic, geometry, natural science at Strasbourg will deal not only with chemistry, physics, geometry, &c., but with physiology, pathology and various other subdivisions of medical science. Chemistry, physics, botany, astronomy are followed in detached buildings in a pleasant garden. It was characteristic of German government that immediately Strasbourg ceased to be French the organisation of a university was commenced.

Near those buildings are others belonging to companies (the "Germania" Assurance Offices being the most important) and individuals, which denote an intention to make the new Strasbourg worthy of the Empire. But public and private buildings cover only a small part of the ground that has been added to the city. The greater portion of the new region lies unused. Roads are marked out, and a building scheme has been completed, but it is no easy busi-

ness to attract the class of people who are willing and able to erect houses. When the state of feeling in the city is considered, it will be evident that time must elapse before the prejudices of the subjects are overcome, for there is not only dislike of the new Government, but, from being so long cooped up within narrow limits, the citizens are no longer enterprising. German officials who would be glad to possess comfortable houses are too poor to pay builders, and Strasbourg has not enough attractions or advantages to allure emigrants from other parts of Germany.

There is, it will be seen, a difficult problem before the authorities in Strasbourg. To leave the ground unoccupied would be a sign of failure, which the Government could not well endure. To assign it to officials or to offer it as a premium for loyalty would be no less risky. For the credit of the Germans it will be necessary to let or sell the land on profitable terms, and the prospect of such a transaction is not clear to a stranger. That a population will sooner or later occupy the region is likely, for the Catholics, who are displaying much energy throughout Germany, are erecting a church which is sufficiently capacious to hold a large congregation. Meanwhile the rulers have to ponder over the difficulty of finding a sufficient number of comparatively wealthy people to occupy some square miles of building sites—a difficulty that is not lightened by the co-operation of the inhabitants of the city.

It is desirable that the ground will not be left in its present state; but when it is covered with new buildings it is to be hoped the inhabitants of the older city will not be inspired with a passion for renovation, in order to make their buildings compete with the latest erections. To Berlin architects the irregularities of the old Strasbourg houses, with their mountainous roofs, must be painful; but as the experiments to modernise the town have failed in the past, it would be wise to allow the houses to retain their primitive character.

ACHIEVEMENTS IN ENGINEERING.*

A SERIES of volumes recording the most important events of the last half-century would be incomplete if nothing was said about the difficulties which have been overcome by civil engineers. Peace hath her victories as well as war, and interesting as the campaigns in the Crimea, Afghanistan, India, Italy, France and America can be for writers and readers, no less courage and skill were displayed in many engineering works. In Mr. VERNON-HARCOURT'S volume, contests are described which at first seemed to be doomed to failure if the men who took part in them had not possessed that determination to run great risks which is expected in all who form a "forlorn hope." It is said to be erroneous to describe the efforts of engineers and contractors as fighting against nature, for ends are gained only by compliance with natural laws; nevertheless, it is true that the compliance or obedience can only be shown in the overcoming of obstacles.

There is hardly a work described in Mr. VERNON-HARCOURT'S book which was not marked by difficulties. In the London Metropolitan railways, which are described in the first chapter, they appeared at almost every yard. Without constant attention, the houses contiguous to the lines would have settled, and the damages were sure to be assessed at an amount that would surely bring the companies into liquidation. That most useless of statues, the *William IV.*, which, without any loss to art, could be relegated to Wapping, is an example of what became necessary in dealing with London streets. With the pedestal it weighs 160 tons, and, as interference was not allowable, the statue had to be underpinned until the line was constructed beneath it. Sewers and other conduits required careful treatment. At Sloane Square a sewer 9 feet in diameter is carried across the upper part of the station, and the beating of the pumping-engine is to be heard. The Fleet sewer and Middle Level sewer had also to be elevated, and along the extension from Mansion House station a new sewer was constructed on each side of the railway as substitutes for one that ran along the middle of the streets.

The New York elevated railways correspond in use with the underground railways of London, a continuous viaduct being used instead of a covered way. The girders rest on wrought-iron lattice columns, placed apart at distances varying from 37 feet to 44 feet. It is said that "the boldest part of the design consists in placing a railway on the top of a narrow superstructure resting upon a single row of isolated columns only $1\frac{1}{4}$ feet by $1\frac{1}{2}$ feet wide, placed 44 feet apart, along the curb on each side of a crowded roadway, and then allowing trains to run constantly at a speed of eighteen miles an hour along this open, unprotected track, which has a maximum width of 8 feet at the top." The cost per mile was 81,000*l.*, but there was nothing paid for the right to set up the columns in the streets, and no compensation was given to the owners of such houses as the railway passes in front of the first floor windows. The underground railways in London cost about 575,000*l.* a mile, but every inch of ground had to be paid for at exceptional prices.

The second chapter treats of the railways across the Alps, Rocky Mountains and Andes. On some of these lines gradients from 1 in 40 to 1 in 25 are employed, and curves are passed over which are 14 chains in radius. These figures show a wide departure from early practice, when "it was considered expedient and generally found practicable to adopt in most places gradients rising not more than 1 foot in 300 or 400 feet of length and curves having radii of little less than one mile." Ordinary locomotives can now be built which will work on lines with a gradient of 1 in $12\frac{1}{2}$ and curves of $3\frac{1}{2}$ chains radius. One of the most remarkable of steep railways is that connecting Lima with Oroya, which stands on the Andes at a height of 12,178 feet. After describing a part of the route and the difficulties encountered, Mr. VERNON-HARCOURT gives the following account of another section:—

> Mantucana, which is reached at $62\frac{1}{4}$ miles from the coast, is only 27 miles from the summit of the railway in a direct line; but a devious course of $42\frac{1}{4}$ miles has to be traversed to overcome the difficulties of the ascent without exceeding the gradient of 1 in 25. At this part of the line, about half-way up the ascent, the cliffs encountered on the route are so precipitous that workmen had to be lowered by ropes from ledge to ledge, cut out of the side of the cliff, till the railway level was reached. The engineers, also, had to be conveyed from one side of the deep ravines to the other in slings hung to a wire cable stretched across at the top. In the distance of 15 miles between Tambo de Viso and Anchi, the railway passes through twenty-two tunnels, and, between Anchi and San Mateo, the Los Infernillos cañon has to be crossed where the river Rimac passes between cliffs of red porphyry rising perpendicularly to a height of 1,500 feet. The railway on emerging from a tunnel through one of the cliffs traverses a bridge spanning the chasm at a height of 165 feet above the bed of the river, and then enters a tunnel through the opposite cliff. The loops and zigzags are sometimes so frequent that, at Chicla, five parallel lines, three on one side and two on the other side of the gorge, are visible, rising one above the other to a considerable height, whilst the greatest horizontal distance between them does not exceed 500 feet. The head of the Rimac gorge is surrounded by such precipitous cliffs that the railway has to traverse them by means of seven tunnels, and then proceeds, through a desolate snowclad region, to the summit tunnel, 3,847 feet in length, which pierces a narrow ridge.

Several other remarkably steep railways are described in the volume. Mr. VERNON-HARCOURT takes much pains to explain the "Abt Rack system," which is one of the latest devices for reaching high points. In the Hartz Mountain Railway it is used on gradients of 1 in 16, in Venezuela on gradients of 1 in 12, and upon the Visp to Zermatt line on gradients of 1 in $8\frac{1}{3}$. The economical importance of such a system is manifest.

A chapter is devoted to tunnelling through mountains, as exemplified in the Mont Cenis, St. Gothard and Arlberg works. Subaqueous tunnelling is next noticed, and England possesses striking examples in the Thames Tunnel, the Mersey Tunnel and the Severn Tunnel. The last-named required thirteen years for carrying out the work, and was several times on the point of being inundated by the sudden and unexpected influx of torrents from concealed springs. On one occasion the works were submerged for a year. It was found necessary to provide machinery that would raise 66 millions of gallons of water daily.

The history of bridge construction occupies a large part of the volume. In 1850 the world was amazed when STEPHENSON placed two rectangular tubes of 459 feet span across the Menai Straits. The Brooklyn Bridge has one span of $1,595\frac{1}{2}$ feet, and two side spans of 930 feet. In the Forth Bridge there are two openings of 1,700 feet each. If

* *Achievements in Engineering during the last Half-Century.* By L. F. Vernon-Harcourt, C.E. London: Seeley & Co., Limited.

the proposed Channel bridge were constructed, there would be openings in mid-channel of 1,640 feet. The use of beams with webs such as were used in the Britannia and Victoria Bridges by STEPHENSON are no longer approved. Lattice girders of a variety of forms superseded them. Then there was a revival of the suspension principle, and the Brooklyn Bridge shows its capabilities for great lengths. Finally the cantilever principle was developed, and as employed in the Forth Bridge its success becomes unquestionable. The conclusion which Mr. VERNON-HARCOURT comes to in respect to future work is thus expressed:—

> There is no prospect at present of the discovery of any metal stronger than steel, and equally cheap, nor is there any known untried principle available for still larger spans. With our present knowledge, therefore, the suspension system or cantilevers seem likely to be resorted to for bridges of unusual span, whilst continuous girders of varying depth appear capable of being extended to greater spans than girder bridges have hitherto attained.

The chapter on Submarine Mining and Blasting contains an account of the removal of the reefs in one of the channels leading to New York Harbour known as Hell Gate. Then follow chapters relating to harbours, river improvements, canals and other works connected with navigation. The greater part of the book is necessarily occupied with works which are required for facilitating communication between towns and countries, which is the main purpose of the profession of civil engineering. Afterwards the new Liverpool waterworks are described at length, and finally something is said about high towers and lighthouses.

The volume is a successful attempt to popularise the knowledge possessed by civil engineers, and acquaintance with the pages would be advantageous to all people. It would be better if the author had given the names of the contractors who carried out the works that are described, for their responsibility was equal to the engineers'. The ignoring of the men who realise ideas is too common in our days, but on that account it is no less unjust.

EARLY EGYPTIAN BUILDING.

THE following narrative of his proceedings in Egypt was read by Mr. Flinders Petrie at the Congress of Orientalists:—

For ten years past I have been engaged on a study of the civilisation and products of ancient Egypt. Explorers in the past have been so largely attracted by the political history and religion of Egypt that our ignorance of the development of its arts and manufactures was surprising; the anthropologic study of the country was neglected, and it is that department which I have attempted to enlarge, not solely for the interest attaching to such subjects, but to serve as a key for comprehending the history and character of ancient Egypt more completely. My last season of excavation has completed the series by a study of the most ancient period known—the third and fourth dynasties, at Medum. Before proceeding to describe the other results, it will be most proper to state the reasons for attributing the tombs of Medum to a period so distant. The system of decoration, the form of the false door, the groups of animals, the technique, are identical with the most ancient tombs known—those of the commencement of the fourth dynasty, published by Lepsius in the "Denkmäler." The titles are, with few exceptions, the same as in those tombs; and even the same family may be recognised, Snefrukhaf of Gizeh being the son of Nefermat, whose tomb is at Medum. In confirmation of this we notice the pottery of this cemetery; it is dissimilar to that of the middle kingdom or later times, but it is identical with that of the fourth dynasty at Gizeh. By all the evidence of character, therefore, it is proved that the tombs of Medum are of the commencement of the fourth dynasty—as early as any dated remains known in Egypt. To this age the Egyptians themselves ascribed them. On the walls of the temple of the pyramid of Medum are numerous *graffiti*. The most ancient of these is discoloured as the walls, and does not partake of the freshness of those of the middle kingdom, which are still white. This obscured *graffito* is probably of the sixth dynasty, or more ancient, and it adores King Seneferu. The base of a statuette found in the temple is dedicated to the gods of Tatseneferu by a woman, Seneferu-Khati, probably in a remote period. And in the eighteenth dynasty the various scribes who visited the place all agree in continuing to recognise it as the temple of Seneferu. The character of the edifice, the extreme simplicity of it, the absence of all original inscriptions, the sole use of calcareous stone, and absence of granite, basalt, and other more difficult materials, all stamp it as anterior to the temples of the fourth dynasty at Gizeh. On the complete accord of all these evidences, the decoration, inscriptions and architecture, it is impossible to doubt that we here study the most remote group of monuments yet discovered.

With the Pyramid of Medum you are probably familiar. It appears to rise in the form of a tower on the western desert, about 40 miles south of Cairo. This peculiar aspect is due to the construction being formed in successive revetments of masonry upon a central mass; a portion of these has been removed, revealing a long face of the interior structure. The primitive centre was a mastaba tomb 100 cubits square. This was continued to a greater elevation and a revetment of masonry placed around it, thus producing a step. The same process, of elevating the existing edifice and placing a new revetment around it, was continued seven times, until the outline became a step pyramid, or pyramid of degrees. The final process was the placing of a continuous revetment at one angle from the base to the summit, producing a pyramid which served as a model to future sovereigns, who constructed their pyramids in one design, without the intermediate stages of masonry. This is the last of the royal mastaba tombs, and the prototype of the royal pyramids. This is the genesis of the pyramid. The temple of this pyramid adjoins the eastern face; it is precisely in the middle, within 2 inches. It consists of a court, open to the sky, on the face of the pyramid; in this are erected two stelæ 13 feet (4 mètres) high, without any trace of inscription, and placed in the middle between these is the altar for offerings, equally destitute of any inscription or carving. A chamber opens into this court, which is quite entire, and a passage proceeds from the front entrance to the chamber. The entire edifice is complete; not one stone of the walls or of the roof has been disturbed. In what manner has such a precious example of primitive architecture been conserved through the vicissitudes of Egyptian history, especially as it is an edifice of calcareous stone, which is seized on with the greatest avidity by spoilers of all ages? I have partly traced the history of it. In the old and middle kingdom the courtyard was yet open, with sand blown into it. The visitors inscribed their graffiti in the chamber lighted from the court. In the eighteenth dynasty this was changed. The court was encumbered with fragments of the revetment of the pyramid, decomposed by two or three thousand years of exposure, mixed with sand blown in. This has blocked the opening of the chamber, which was thus left only accessible from the entrance passage, and visitors brought in pieces of papyrus plant to burn in order to view the dark chamber. They inscribed their graffiti in this age entirely in the mouth of the passage lighted by the front entrance. Towards the close of the eighteenth dynasty some persons appropriated the temple, then much encumbered above with débris, for a tomb; and a body, with beads of that period, was buried in the sand which half filled the passage. The entrance was carefully blocked with stone, and probably the débris was heaped over it to conceal it. These measures were only just in time to preserve this temple. The masons of Rameses II. destroyed the temple of Illahim and despoiled that pyramid for the stone, and they appear to have also partially despoiled the pyramid of Medum, as the débris of it was accumulated high above the temple at the time of the twenty-second dynasty, when the mass was used for a cemetery. Thus the successive attacks on the pyramid, which is the quarry of the district to this hour, have rendered the small temple more and more secure. So safe was it that when I determined to excavate for it I had to remove 40 to 60 feet depth of débris (12 to 18 mètres) in order to discover it, as there was no trace of any building visible, and it was only by the force of analogy that I conceived of the existence of a temple in that situation.

In the cemetery of Medum I opened a great number of tombs of the fourth dynasty which were entirely intact. These contained no ornaments or objects, excepting rarely some pottery or a wooden head-rest, but I obtained thus a series of entire skeletons of this period, which are now being prepared at the College of Surgeons, and will provide an anatomical study of importance for ethnology. The peculiar mode of interment of the greater part of these shows that a religious difference then existed. The bodies of the highest class or race were interred extended at full length, and accompanied by vases of stone or pottery and head-rests. But, on the contrary, the greater part of the bodies were interred contracted, with the knees drawn up to the breast, even where the chamber was quite sufficiently long to deposit them extended, and there is no trace of mummification. Although many of these tombs were expensive, being cut in the rock to a depth of 30 feet or 40 feet, yet in hardly any instance was any pottery discovered, only one or two of the smallest and roughest vases in one tomb. That this treatment was not due to neglect we see from the care an regularity with which the deceased are placed. The head is always to the north, the face to the east, the body lying on the left side. Such essential differences in the mode of interment and the provision for the deceased point to a difference of race. And it seems probable that the contracted interment is due to

the prehistoric race of Egypt, while the dynastic race nterred the bodies extended and with a provision of vases, &c. The skeletons were well preserved, but tender and friable; the bones lay in their places, and the linen cloth wrapped round the body was intact. Rheumatic disease and other maladies of the bones were already well known at that period. One of the largest mastabas has demonstrated to us the very correct and elegant method by which the Egyptians delineated the foundation of their edifices when the faces were not vertical. To trace the foundation of a mastaba, with an angle of 75 deg., on an irregular base, partly high, partly low, is not an easy affair. The great mastabas of Medum were pillaged while the memory of their construction remained. The attack has been by cutting a forced passage direct to the chamber, disregarding the precautions of the defence of the proper passage. In other mastabas I found that the pit to the sepulchre had been opened, while other pits which had no interment below them had been disregarded. I discovered one personage of high rank in a pillaged tomb. His head had been broken off, but was particularly replaced on a block of stone in the correct contact with the body. The process of mummification is very peculiar. After the dessication of the body it was rolled in linen, over that a covering of resin was applied and moulded into the exact form of the living person, with all the muscular and fleshy parts modelled to their natural proportion. Over this restored figure a few turns of the finest gauze were rolled. Such a method has not been seen before. The magnificent sculptured tombs here were in a pitiable condition. Left exposed to all the injuries of the natives and visitors, they have suffered far more in the last 20 years than in 6,000 years before. I have made a complete copy of them all, of the full size, and then carefully buried them completely until better times shall come for the antiquities of Egypt. These copies will be completely published on a reduced scale, and the parts that retain the colours will have them reproduced.

THE EXCAVATIONS AT POMPEII.

A CORRESPONDENT of the *Standard*, writing from Naples, says economy is the order of the day now in Italy; an order of which no one complains so long as there is reason in it. But when it comes to curtailing the endowment granted years ago by the Government for carrying on the excavations in Pompeii, it is another matter, and assuredly Signor Bonghi expresses the sentiments of all his intelligent compatriots, as also of every intellectual foreigner, in protesting against such a false economy. In a letter of the 28th ult. he addressed Signor Colombo on this subject:—

"Economy is good; but, like everything human, it has its bad side. In more than one instance we have acted like the master who, when his income was declining, ordered his cook to continue to serve him with five dishes daily, though spending ten liras a day less than formerly; but he was at liberty to make them so bad that they would be scarcely eatable. So it is, my friend, with the economy practised in ancient Pompeii, which appears all the worse because of its proximity to new Pompeii, where private individuals are as anxious to spend for the benefit of that town as the State is to economise for the former city. Originally, if I am not mistaken, Pompeii received an annual endowment of forty-three thousand liras. From this sum thirty-five thousand has been retrenched, in consequence of which the excavators, eighty and more in number, have all been dismissed at a moment's notice. At the rate at which the excavations were carried on hitherto they would not have been completed a hundred years hence, and now it is impossible to say when the work will be finished. Silence reigns more than ever in the ruins; science hopes no more; there is nothing to renew the curiosity of the foreigner. The little that remains of the endowment fund, together with the entrance-fee which I introduced in happier times, hardly suffices to save the ruins from destruction, to complete the replastering, &c., which has been carried on with such care and activity, and which alone prevents the walls from falling in and burying the mural paintings already brought to light.

"Again, the damage is more extensive than appears at first sight, since the Pompeian funds form a reserve also for all the excavatings of the south, such as the unremunerative works in Sibari, those more fortunate of Cuma, Sicola, and others. From these funds the maintenance of the edifices belonging to these provinces, of Greek, Roman and Mediæval temples, is procured. From these, also, the sum of sixty thousand liras was furnished by the foolish orders of the Ministry, in order that the German Emperor might witness the excavation of a particular object, and that others might have a copy of it. Nor was this all the expense, for the earth which had been removed with such furious haste had to be conveyed afterwards to a place where it neither injured anything nor obstructed the way. I, and others also, have often wondered at the facility and indifference with which the Government of my unhappy country overthrows habits and customs introduced by itself, and throws upon the streets people whom it has taken away from their original occupation, rendering penniless those who have enabled it to gain so much. What are these unfortunates, so peremptorily dismissed, to do now? They were but poorly paid men and women, and consequently could not put a centesimo aside. Therefore, from the moment they were turned adrift, they were reduced to beggary.

"The levelling of the ground in Pompeii is an art that not every labourer can acquire. Those who have learned it by practice, under the guidance of the superintendents, will forget it again, from want of habit. When the day comes in which my poor country has another thirty-five thousand liras to spend in the culture and research of her most ancient history, she will have to teach others the trade which she now snatches ruthlessly from those whom she herself took so much trouble to instruct. For, by reason of the poverty to which she condemns these, she cannot hope to find them again if their services should be required. I cannot say if the economy of the thirty-five thousand liras will save the Budget and solve the mystery of the deficit; but I know that it causes too much suffering, and conceals the problem of Pompeii.

"If the State cannot give the sum, the Ministry must look for it elsewhere, and I see many ways of finding it easily. But here is the evil: we Italians are sometimes afraid of getting decrepit before we have recovered our maturity. What matters about Pompeii; why trouble about such antique things? If you remind those who speak thus of the importance of these excavations to science and history, they shrug their shoulders with a pitying smile. It is useless to tell them that all the antique ruins with which the Italian soil is covered are a charge which does not belong to her alone; that it is already a disgrace to have delayed more than a century the excavations of Pompeii, to name only one ruin, and to owe to France the recovery of her perimeter. . . . But you know, Villari, that such economy is neither good nor useful for the country; on the contrary, we should seek to give her more animation, wider prospects, and help her to look far and high, and inculcate in her more elevated tastes. As it is, we ought to blush before foreigners; for we make them believe, by such acts, that we are even more miserable than we are. Our poverty appears really a disgrace to us. And yet they want money, and clamour to you for it; well, then, tell them—and, perhaps, this will convince the clowns I mentioned above—tell them that the entrance-fee which in the last ten years has given to Pompeii half a million or more, this same tax, risks being also diminished. Already one sees signs of it, and it will increase if Pompeii continues to remain silent, and to change itself from antique to old."

This protest has drawn from the Italian Government a denial, but there can be little doubt that Signor Bonghi knew what he was writing about, and had good grounds for his vigorous protest.

ASIATIC ARCHITECTURE IN POLYNESIA.

AT the Congress of Orientalists on Tuesday Mr. R. Sterndale read a paper on "Asiatic Architecture in Polynesia," from observations collected by his brother, the late Mr. Handley Sterndale. Mr. H. Sterndale spent many years in the remote islands of the Oceanic group, and made many drawings of delicate finish, though he had to draw with sharpened bullets and work up the drawings with pens of fish-bone and tint them with sepia taken from the cuttlefish. Mr. R. Sterndale said that one of the reasons why the remarkable architectural remains existing in the many islands of the Pacific had as yet attracted so little attention was the prevailing idea of their comparatively recent construction. The early people of the Carolines were builders of Cyclopean towers and pyramids, and were still very skilful in building great walls of rude stone. Though many of the Pacific islands had been peopled by accidental castaways, the settlement of the great mountain groups was effected by organised migrations of savage navigators, fighting their way from land to land, and carrying with them their families, household gods and the seeds of plants and trees. The copper-coloured autochthones of Eastern Asia spread in the course of ages to the Caroline group, and were the progenitors of the Palaos, Barbudos, Hombres, Biancos and other families of gentle barbarians. They were followed by another exodus of a kindred race, ferocious and pugnacious in the extreme and Cyclopean builders on a large scale. That these wars were frequent and destructive seemed probable from the style of their castles and strongholds, built on steep hills or surrounded by enormous trenches. That these people were greatly impressed with their religion was evident from the architecture of their temples—immense quadrangular, paved enclosures, surrounded by lofty walls and containing within them terraces, pyramids and frequently artificial caverns and subterraneous passages. Some of these structures were mausoleums as well as temples. They were spoken of by the present race of

natives as the sepulchres of the ancient deities. While exploring the mountain ranges of Upolu, at that time the theatre of a war between rival factions of Samoans, Mr. Handley Sterndale came across some stupendous Cyclopean remains belonging to the race which founded the Samoans of the present day. He found an enormous fort, in some places excavated, in others built up at the sides. This led him to a truncated conical structure about 20 feet high and 100 feet in diameter. The lower tiers of stone were very large—were, in fact, lava blocks. They were laid in courses, and in two places near the top there seemed to be entrances to the inside. It was not likely that it was intended itself as a place of defence, but rather as a base or platform upon which some building had been erected. It was no doubt the centre of a village, as many foundations of a few feet in height were near it. The Samoan natives had no tradition of what people inhabited this mountain fastness. No food-bearing trees were to be found here, and the question was on what the inhabitants used to live. The question had arisen whether Polynesian architecture was of Asiatic or of South American origin. He believed that the preponderance of evidence was in favour of the Asiatic theory. Indeed, it seemed probable that the American continent was influenced by the same migration from Asia which gave the copper-coloured races to Polynesia.

TESSERÆ.

The Marlborough House Museum.

It had long been thought desirable, both for the use of the schools and for the improvement of public taste, to form a museum of manufactures selected for their excellence in design or their skill in art workmanship, illustrative also of the history and progress of industrial art. Taking advantage of the French Exposition of National Industry at Paris in 1844, the Council at Somerset House, with the sanction of the Board of Trade, decided to expend 1,400*l.* on such examples of art-manufacture as might appear to the director of the schools calculated to benefit the students, as illustrations of applied design. The close of the Great Exhibition of 1851 affording a favourable opportunity for the further acquirement of modern examples, Parliament made a grant of 5,000*l.* for this purpose, and with this sum a selection was made by a committee consisting of Mr. Pugin, Mr. Owen Jones and the two superintendents of the Department, consisting of woven fabrics, metalwork, enamels, ceramics, wood carvings and furniture. The articles so selected were removed to Marlborough House, where they were first exhibited to the public in May 1852, together with many loans and donations from Her Majesty the Queen, His Royal Highness the Prince Consort, the Royal Commissioners of the Great Exhibition and many others, and thus was formed the nucleus of the incomparable collection now to be seen in the South Kensington Museum. At one time a prominent feature of the display at Marlborough House was a collection of carpets, chintzes, paper-hangings, porcelain, &c., purposely selected as examples of "false principles" in decoration; and this section, though entertaining enough to the public, was productive of some amount of animadversion, for it was certainly not agreeable to manufacturers to find their productions—perhaps the most profitable ones—gibbeted in the eyes of the public with the announcement that there was "want of meaning and unity in the pattern," that "the helter-skelter distribution of the lines" were like "productions under the influence of nightmare," and so forth. The names of the manufacturers were not mentioned, and in the later editions of the catalogue the more trenchant criticisms were softened down, but those who visited the exhibition will not readily forget the amusement caused by a display which was certainly somewhat invidious in its nature, and has never since been repeated.

Contractors and Architects.

The word contractor, although perhaps older in its reference to mercantile and monetary matters, does not appear to have been very frequently applied to monopolists, in building matters, before the present century. Indeed, Harris, "Hist. of Dublin," Lond., 1766, styles the architect-engineer Semple "overseer," and the builder or mason Mack "undertaker"; and Mulvany shows that in 1784 Gandon was supposed to be "a contractor," and as they termed him "a projector or undertaker"; and that the gentry of Bandon in 1795 called a contracting builder an "architect." The Reports of the Commissioners of Military Inquiry, 1806, at first style the builder "proposer," and afterwards "contractor." But except in some works for the English Government, the system was not then that which now prevails. In the seventeenth century the existence of "resident surveyors," mentioned *s. v.* "architect," as at Wollaton and Holkham, rendered the condition of master-builder precarious, if it even were possible, as a monopolist; but in the eighteenth century there was a change of practice on the part of the clients, who either preferred to have the work measured and valued (sometimes on a schedule of prices), or else employed an architect, who, as in the case of Jupp at the East India House in 1799, made his design and submitted an estimate upon which he obtained advances of money, making with the tradesmen his contracts, which, with the receipts, he produced at the termination of the works to his client; and it was customary for the latter to make a present, beyond the commission, if the works were executed within the estimate; thus 1,000*l.* is said to have been given in the cases of this building and of the gaol at Nottingham. The Irish architects, so late as 1803, practised in this manner, as Gandon appears to have done in the courts at the Custom-house of Dublin. Of course this system created a class of architects who, frequently advancing money for their patron, presented an abstract of the accounts, received a gross amount when this bill was sent in, and distributing it amongst the tradesmen, derived a discount or percentage from them; and the architect was more or less openly a builder, as he could make contracts with his client for a higher sum than those delivered to himself; the quarrels and extra charges of tradesmen following each other were avoided, and it must have been often found convenient that there should be only one creditor. Sir W. Chambers was a contractor in the erection of Parkstead at Roehampton, 1767, and his contracts for Pepper Harrow, 1775–76, still exist; a combination of positions now considered to be derogatory to the interests of the architect and his employer. As the building trade was rapidly falling into few hands, capitalists and others embarked in it, especially about 1815, and then the system of competition contracts with all its stratagems came into full force, especially after the panic of 1825, when many speculative builders found it best to work for others besides themselves. The epoch of the "division of labour" has seen all the trades connected, however remotely, with a building combined in single hands, and has commenced a system of under contracts called subletting, which cannot be sufficiently deplored on account of its attendant evils.

Spanish Renaissance.

It was first called the Græco-Romano from being a revival of the practice of those nations, and because the earliest Spanish work on the subject was entitled "Medidas del Romano." This now rare volume was first published at Toledo in 1526, by Diego de Sagredo, and contains engraved admeasurements, working plans and details taken from the edifices of classical antiquity, with rules and extracts from Vitruvius. Another and most appropriate term is La Arquitectura Plateresca, the silversmith's style, since the minute chasings and infinite ornaments recalled the elaborate works of the D'Arphes and other artists in plate, the Cellinis, in whom Spain, the mistress of the mines of Peru, was pre-eminent; and when we behold the rich chisellings of this period, lavished over marble façade and spandrel, and sparkling under a gilding sun or frosting moon, the effect is that of a plateau set out for the banquets of Olympus. This plateresque arabesque is also known in Spain as the style of Berruguete, by whom it was carried to unexampled perfection, and who has stamped the manner and epoch with his own name and impress. He was born in Old Castile in 1480, and died at Toledo in 1561; in youth he studied at Florence under Michel Angelo, and, like his master, was at once a painter, sculptor and architect; he was unequalled in sepulchral monuments and altar-screens, those retablos or reredoses for which Spain is so distinguished. The other most eminent artists of this fascinating school are Gaspar de Tordesillas, Xamete, Riaño, Diego de Siloe, Daniel Forment, Felipe de Vigarny, Villalpando, Christobal de Andino, Celma, Martin de Gainza, and the families of Covarrubias, Valdelvira and Ruiz. There is scarcely a cathedral city in Spain which does not abound in memorials of this period, when prelate and prince vied in erecting monuments which now appear disproportionate, such is the present poverty and "silence, the worst symptom a town can have." In Spain, as in the East, the time-honoured and well-selected capitals of older kings have shrivelled away, the source of their life having been cut off by the change of residence of a despot, to whose vanity, caprice and convenience they were sacrificed. The finest specimens of the Græco-Romano style exist at Toledo in the Sta Cruz, San Juan de la Penitencia, the choir and chapel de los Reyes Nuevos in the cathedral; in the cathedral and chapter-houses at Seville; in the colleges of Cuenca and El Arzobispo at Salamanca; in the chapel of San Ildefonso; at Alcalá de Henares; in the altar-screens of the cathedrals of Huesca and Zaragoza; in those neglected museums, those hitherto unworked mines of art, the cathedrals of Cuenca and Siguenza; in the cloisters of Guadalupe, Ona, Huerta, San Gregorio at Valladolid, and Lupiana near Guadalajara. The plateresque mansions are equally numerous, and it must be confessed that these gay arabesques and warlike Roman decorations are better suited to the court-yards and banqueting-halls of chivalrous magnificence than to the cloister and refectory of the monk, or the altar and tomb of the Christian priest. The Cæsars, cupids, satyrs, tritons and battle-axes mingle in-

congruously with the cowls, ropes and racks of martyrs, with the crozier and cross, emblems of peace and religion. Among the richest examples of these lay edifices may be cited the Casa del Ayuntamiento at Seville, the mansions of Monterey and Almarza at Salamanca, the archbishop's palace at Alcalá de Henares, the houses of Vargas at Toledo, of the Cobos at Ubeda, of Caraza at Seville, of Zaporta at Zaragoza, of Salicofras at Valencia, of Dusai at Barcelona. They indeed abound everywhere, sadly abandoned, by tasteless absentee proprietors, to the cobwebs of the unjust stewards, who creep like mean insects into the vacant shell of a nobler animal; on them too, however, the vials of foreign wrath have been poured out to the dregs when armed hordes bemired them as barracks. The arabesque style, too brilliant to be long-lived, arose a fashion and passed away like a meteor. It died with Charles V., whose Spanish chivalry was mingled with a Flemish, German and Italian element. Philip II., his successor, an old Castilian to the backbone, serious and bigoted in creed, pure and refined in taste, soon pruned an art which bordered on meretriciousness and paganism. The builder of the old colourless Escorial took refuge in the chaste Doric, the favourite order of his great architect Herrera, who, like his contemporary Palladio, gave his name to his style and fixed an epoch. While the Italian revelled in the beautiful Corinthian the Spaniard courted a Spartan simplicity; his cathedral at Valladolid (1585), and still more his masterpiece, the chapel of the Escorial (1563), are unrivalled triumphs of majestic breadth, unadorned solemnity and architectural proportion. Appointed by Philip the minister of public works, the plans of every building were first submitted to his approval; with him and his pupils, the Moras, the architecture of Spain came to a close, as did her greatness.

Renaissance Silversmith's Work.

When we turn from the goldsmith's to the silversmith's art we encounter a notable deficiency of specimens of household plate during the centuries preceding the fourteenth, the services of the skilful in the craft having been, to a great extent, monopolised by the Church and royalty, in whose hands, except in Italy, money had been alone allowed to accumulate. It must ever be remembered that during the Middle Ages means of profitable investment for such accumulations were altogether wanting, and that large sums were consequently devoted to the equipment of treasuries, both civil and ecclesiastical, in the most magnificent manner. This necessity can alone account for the prodigious quantity of gold and silver described in many ancient inventories—such, more especially, as that of Louis of Anjou (1360 to 1368)—a prince whose services of plate would appear quite out of proportion to his revenues but for some such interpretation. When stern necessity made some sudden demand upon the resources of such magnates, instead of selling out consols as a capitalist of the present day might do, they were compelled either to send for a Jew or Lombard, to whom they might pawn their plate, or to melt it up at once themselves. Hence it is, in a great measure, that so few remains of ancient silversmith's work, anterior to the gradual settlement of a sound financial system in the sixteenth century, have come down to our days. As trade increased and money accumulated at the great head-quarters of commerce—Florence, Genoa and Venice—the overflowings of the coffers of the merchant princes found a tangible embodiment in ornaments, utensils and implements skilfully wrought in the precious metals. The domestic luxury which had been restricted to royalty and the highest of the aristocracy was rivalled by that of the great banking families of Italy—the Bardi, Strozzi, Chigi, Medici, &c., and their correspondents, such as Jacques Cœur in France and the Fuggers of Augsburg. Not only were the tables loaded with grand drinking-cups in the various forms of tazze, hanaps, pokals, mazers, widercoms, &c., with silver plates, escuelles, dishes, spoons and magnificent salt-cellars serving for personal use, but great fancy pieces in silver, gilt, and parcel gilt were also added for pure display. Among these the most usual and important were the "terrasses," or plateaux for epergnes; the "nefs," or centre-pieces, usually models of ships; the "languiers," or tests for poison; and the fountains, or conduits, made to run with wine so long as the banquet lasted. The splendid dishes into which scented waters were poured over the hands of the guests from "aiguières," or ewers, were also very noble; and of these, as well as of the hanaps and other goblets, some very remarkable specimens have survived.

Ancient Cisterns in Constantinople.

The cistern of Jereh-Batan-Serai, or the subterranean palace, which yet exists in its original condition, contains running water brought from a great distance, and we may thus conjecture that the other cisterns were supplied in the same manner. It was formerly called Cisterna Basilica, the imperial cistern. It consists of a great underground tunnel, the arches of which are formed of brick and Khorassan mortar, supported by marble columns having capitals mostly of different orders and sizes; in other instances the capitals are smooth blocks. The bricks are inscribed with a monogram, the meaning of which is undeciphered, yet the cross which they contain places the building about the period of the middle ages. The bricks are 0·362 mètre square and 0·039 mètre thick, and are composed of a reddish substance, very fine and compact; they appear to have been much burnt, and their specific gravity is greater than that of modern bricks. The nature of the structure requiring great solidity in the arch, the Khorassan mortar between the bricks is of equal thickness to their own, and all the cisterns and subterranean conduits are built of the same component parts. The cistern Jereh-Batan receives its supply of water from the Dshebedshe-Kibi. It served as a reservoir for times of drought, and is the only one which retains its former destination, owing probably to its vicinity to the Seraglio, which it supplies with an additional quantity of water for six months subsequent to May. It is impossible to obtain an accurate idea of this cistern and its vast extent, as it is filled the entire year with a considerable depth of water and silt, but it is believed to extend as far as Sta Sophia, the mosque of Sultan Achmet, and to the Hippodrome. The cistern of Bign-Bis-Dirck, or the thousand-and-one columns, was formerly called Philoxene, in opposition to the Basilica, which was exclusively for the use of the Emperor, while the former was intended to supply the public. It is situated to the rear of the Hippodrome, on its western side, and consists of a wide, square vault of unequal sides, one being 29·23 mètres and the other 51·97 mètres long. Its roof, constructed in brick, is supported by three corresponding tiers of white marble columns; a tambour serves as a base to the upper column and for a capital to the lower one. Each row has 224 columns, placed at equal distances of 3·16 mètres, and making in all 672 columns. Those of the upper tier which support the vault alone exhibit their whole height, which is 4·39 mètres, the middle row show only a height of 2·46 mètres, the remainder, as also the entire of the lower tier, being buried in the deposit of silt and earth. A well, 4·87 mètres in depth, sunk in this accumulation, and which is supposed to reach the original bottom of the cistern, confirms the opinion as to its having three rows of columns; and consequently it would have contained 42,461 cubic mètres of water. As, therefore, the total quantity of water required for the daily use of Constantinople amounts to 9,181 cubic mètres, it would need the whole of the water which runs in the interior of the city during a space of five days to fill the cistern, and would form a reserve of nearly sixty days' supply for the use of the district to which it belongs. All the capitals of the columns are smooth, and of similar diameter and size; it would thus appear that this monument was constructed from a carefully designed plan. Some of the capitals have also crosses incised on them.

Canal Navigation.

The first important step taken with a view to apply canals on a large scale to navigation, namely, the invention of locks, is attributed to Leonardo da Vinci, towards the year 1500. Notwithstanding the importance of this invention, inland conveyance by means of canals does not appear to have been much used till the year 1612, when a Frenchman, Pierre Paul Riquet, presented Louis XIV. with a project for a canal from the Mediterranean to the Bay of Biscay, which was commenced under Riquet's auspices and at his expense. This appears to have been the first attempt to make canals a general mode of internal communication. The Belgian and Dutch canals were begun before, but not under the same difficulties. The Canal de Briare appears soon after the Canal du Languedoc; it was opened in 1642. England was far behind the Continent in canal engineering, but when once the Duke of Bridgewater had set the example, the English capitalists set on in right earnest. It is a curious fact, that while on the Continent the development of those two great instruments of progress—railroads and canals—was gradual, and can be traced rather to the increasing wants of the country than to the leading influence of any individual, in England, on the contrary, their development was so rapid as to assume the form of a mania, and that almost entirely owing to a few men, more particularly Brindley for canals and George Stephenson for railroads. The French, however, boast of their Brisson, engineer in chief of the Ponts et Chaussées, who devoted several years to perfecting some of the most important canal lines in France, more particularly the northern navigation by St. Quentin and the Oise, the canal parallel to the Somme, and those from the Rhone and Marne rivers to the Rhine. A canal cannot be too wide if it can be supplied with water. A blunder evident to all engineers was committed, both in England and in France, in giving the locks, bridges, viaducts, &c., only just width enough for the passage of one boat, so that any considerable increase in the activity of the traffic or the size of the boats will compel the canal owners to pull them down and rebuild them entirely. The idea of applying steam power on canals is as old as the application of the steamboat itself; it was tried on the Forth and Clyde Canal in 1802, but was abandoned on account of the surge caused by the paddles washing the banks of the canal. In 1812 fresh trials were made, and the banks of the canal protected by a coarse stone pitching.

NOTES AND COMMENTS.

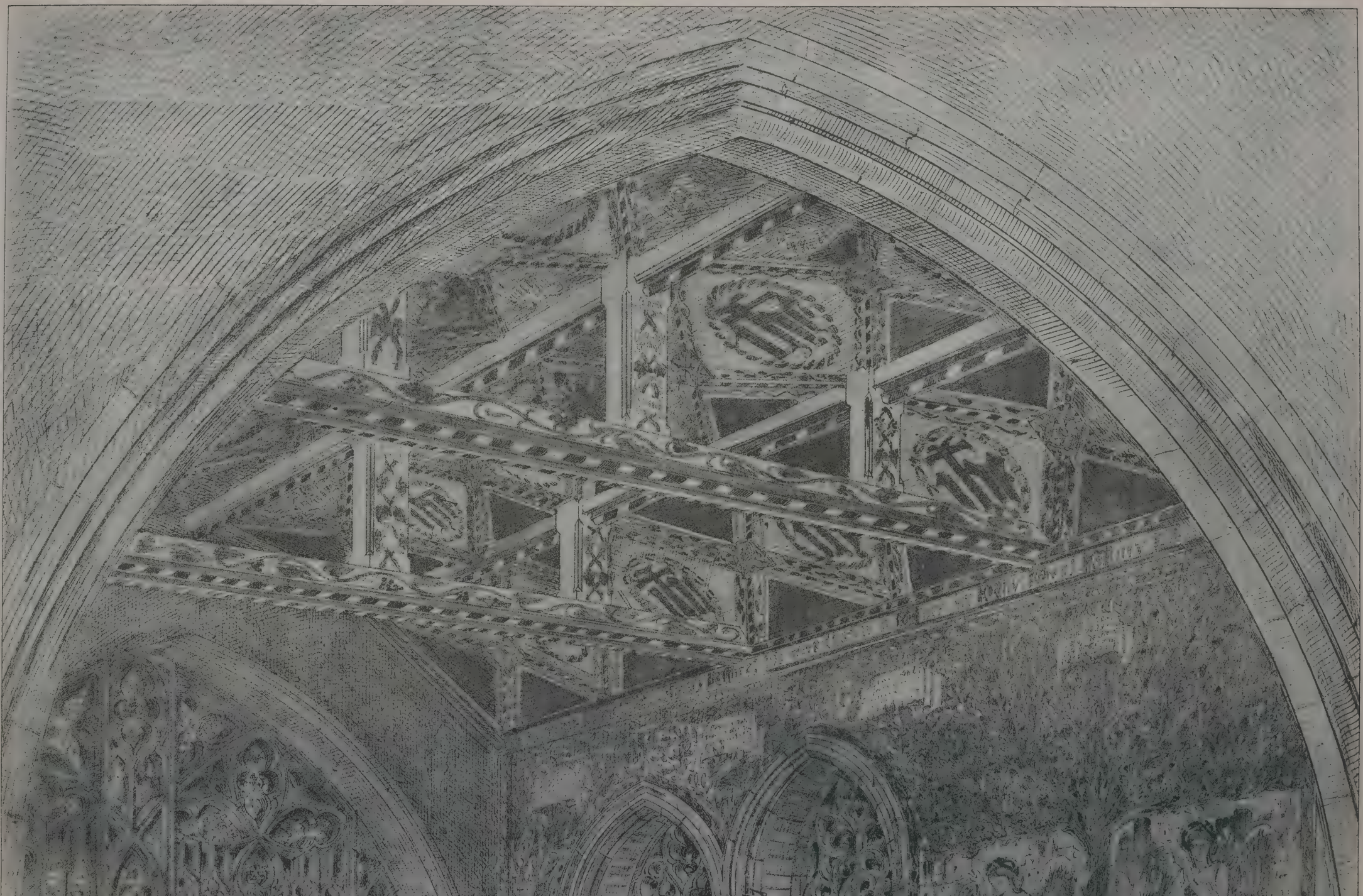
THE Romans are beginning to discover that an excess of enthusiasm is a dangerous commodity when there are memorials to erect. VICTOR EMMANUEL was too patriotic a king to desire to become an oppression to his people when he was no longer among the living, but owing to the extravagant adulation of the Italians he is doomed to increase the financial embarrassments of Rome and Italy. It will be remembered that a competition was got up for obtaining designs for a monument to IL GALANTUOMO. The first prize was gained by M. NENOT, who at the time held the Prix de Rome, and was a student in the Villa Médicis. He proposed to raise the memorial on a suitable site in the Via Nazionale, near the railway-station. But the Italians would agree to no such destination. The image of the king was to awe the world, and only one place was suitable, viz. the Capitol. Public opinion bore sway, and preparations were commenced. But the selection of the Capitol comprised the destruction of many houses, and as owners of property, however patriotic, are not prone to making sacrifices, the compulsory purchase has turned out to be a costly affair. About 350,000*l.* was voted for the memorial, including all sculpture. According to the last report over 300,000*l.* has been expended. But the property required is not all paid for, and the lower part of the monument is not as yet complete. It will be necessary to obtain more money, but the present state of the Italian Exchequer does not warrant an expenditure on monuments of any kind.

THAT Welshmen settled in Ireland from time to time seems to be unquestionable, but their residence has given rise to many of the puzzles which make Irish archæology so illusive a subject. One case is to be found in the dialect which is still to be traced in Forth and Bargy in Wexford, and which is supposed to prove that with the Welshmen were Flemings, who had previously settled in Pembrokeshire. The words and phrases sounded so strange that a century ago GROSE, the antiquary, considered the Forth speech "to be a Teutonic tongue introduced in the first age of Christianity or perhaps earlier." The dialect was considered in CROMWELL'S time to be no more than the English spoken in CHAUCER'S day. It is remarkable, however, that in all Ireland only one church is to be found which was dedicated to St. DAVID, the patron of Welshmen. It is found in Naas, county Kildare, and was visited last week by a local archæological society. There seems to be no doubt that it was erected by Welsh settlers soon after the Anglo-Norman invasion. Mr. T. DREW sees some affinity between it and Christ Church Cathedral in Dublin. Unfortunately only a part of the original building remains. In 1830 the rector invoked the aid of the Ecclesiastical Commissioners to improve the church, which they did so effectually that the aisle was removed with its prayer-desk and pulpit; an enormous structure, consisting of a lofty pulpit and expansive reading pew, was set up instead right in front of the chancel arch. The church presents some peculiarities. It is 1 foot wider at the east than at the west end, and the south wall is 2 feet wider than the north wall. The font is considered to date from the eleventh century. The tower looks venerable, but is a mere modern addition. There is an old bell in the tower which bears an inscription, "R P W C, 1674, Os meum laudabit Dominum in ecclesia S. Davidis de Naas." It is assumed that the site of the church corresponds with that of a tent in which St. PATRICK preached.

ONLY a few weeks have passed since the appearance in this journal of M. PAUL LEROI'S article in which, for the first time in England, justice was done to the surpassing merits of ELIE DELAUNAY as one of the few representatives of the grand school in France. On Saturday last the painter passed away from this world. Like so many able men of the period, he suffered from heart disease, but so sudden an ending to powers that seemed to be beyond decline was not anticipated by his family or friends. ELIE DELAUNAY was born in 1828 in Nantes. He was taught by LAMOTHE and FLANDRIN. In 1856 he won the Prix de Rome. He obtained his first medal for a picture in the Salon in 1859; others were awarded to him in 1863, 1865, 1867 and 1878. In 1889 a Grand Prix came to him in recognition of his works in the International Exhibition. He was admitted to the Legion of Honour in 1867, was raised to the rank of officer in 1878, and in 1879 he was elected to the Institut. It will be evident from the list that the great merits of DELAUNAY were not unrecognised, but all who were competent to appreciate the painter's works considered that his rewards were insufficient. Nature had endowed him with genius for art, as well as with modesty and a most delicate sense of honour; his industry was constant; his love of painting increased with years. He wanted, however, the commercial spirit, for he was too proud to sacrifice the dignity of an artist to the exigencies of the market. It might even be said that DELAUNAY was not fully appreciated until his later years, and his portrait of Cardinal BERNADOU in this year's Salon was enough to convince all who had withheld their admiration that his genius continued to be endowed with the vigour of youth. He upheld the old traditions of high art, and painted religious, mythological and historical subjects in a manner that suggested he believed in them. He was no less skilful in portraiture, and his sketches for LAFONTAINE'S "Fables" revealed skill as an illustrator. His best works are to be found in churches and public buildings.

THE Americans deserve credit for endeavouring to mitigate the evils which characterise too many competitions. According to the *American Architect*, the authorities of the State of Rhode Island have invited Messrs. HOPPIN, READ & HOPPIN, and Messrs. STONE, CARPENTER & WILSON, and W. R. WALKER & SON, of Providence; and Messrs. CARRÈRE & HASTINGS, MCKIM, MEAD & WHITE and J. C. CADY & Co., of New York; and Messrs. SHEPLEY, RUTAN & COOLIDGE, of Boston, to submit designs for a new State House in Providence. For each design, which shall be certified to by the expert architects who will assist the Commission, as complying with the conditions of competition, one thousand dollars will be paid, provided that its author shall have made no attempt to influence the decision of the Commissioners or their advisers, and that it shall appear that the probable cost of carrying it into execution will not exceed by more than twenty-five per cent. the limit of one million dollars fixed by the conditions; but the property in the plans still remains in the architects submitting them, and they are only to be used, in whole or in part, by agreement with their authors and further compensation. From the designs furnished which conform to the conditions, one will be selected which shall be presented to the general assembly of the State as the design for the new building; but this design shall still remain the property of the architect or firm who made it, and is not to be used, in whole or in part, unless such architect or firm is employed to carry his plan into execution according to the rules of the American Institute of Architects. It will be observed that the programme does not absolutely promise the execution of his plan to the author of the design selected; but, as the Commissioners are only authorised to present a plan, but not to engage an architect, they were unable to bind the State any further. It was, however, within their authority to promise that the design selected by them should not be used without proper compensation to its author, and this they have done.

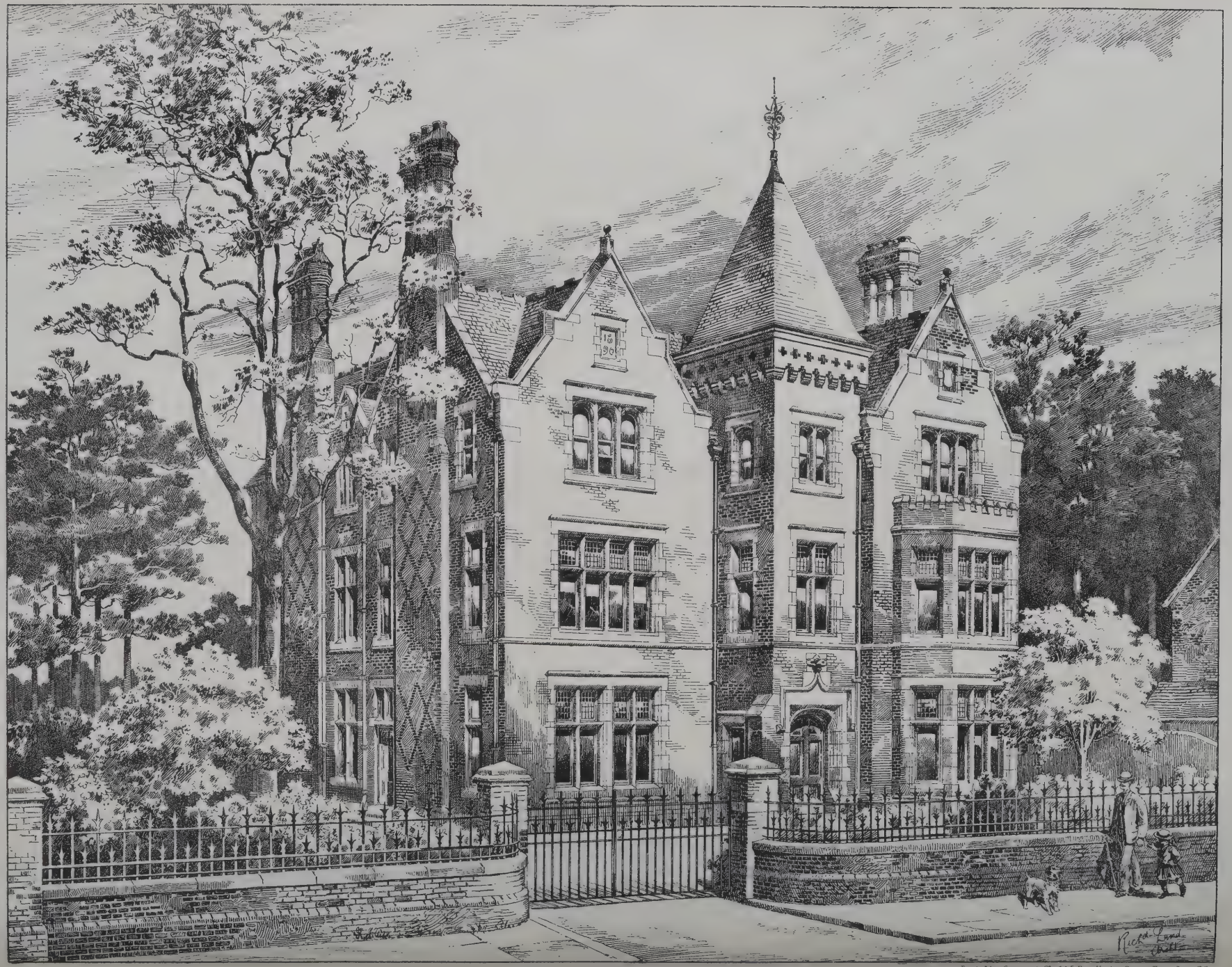
A REPORT of the recent Congress of Hygiene and Demography has been issued from the office of *Public Health*. Many of the most important papers are printed in full, and careful abstracts of others are given. The volume is ample enough to satisfy most readers, and it should be possessed by all who care, on official or personal grounds, about sanitation. It suggests what is known by experience or imagined about many subjects which concern the health of individuals. Unfortunately the papers and discussions in the architectural section are suggestive of *impromptu* attempts that are inspired by willingness to oblige, and will not bear comparison with the work in the other sections. It is a pity that on such occasions some efforts are not made to uphold the reputation of the profession through essays that are expressive of practice.





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ALL SAINTS', LEEK: PAINTED DECORATIONS IN CHANCEL



Printed by Sprague & Co° 4&5 East Harding Street Fetter Lane E.C.

HOUSE AT BEDFORD FOR MR. W. H. SMITH.





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52A BERKELEY SQUARE, W.: DRAWING ROOM.

MERVYN MACARTNEY, B.A., Architect.

The Architect, Sept. 11th 1891.

52A BERKELEY SQUARE, W.: HALL.
MERVYN MACARTNEY, B.A., Architect.

INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET FETTER LANE, E.C.





HOUSE AT BEDFORD FOR MR. W. H. SMITH.

RICHARD LUND, Architect.

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

52A BERKELEY SQUARE, W. [M. MACARTNEY.]
NO. 405.—DRAWING-ROOM. NO. 406.—HALL.

NO. 407.—ALL SAINTS, LEEK. PAINTED DECORATIONS IN CHURCH. [G. C. HORSLEY.]

HOUSE AT BEDFORD.

THIS house has been recently erected for Mr. W. H. SMITH, manager of the Bedford Gasworks. It is built of red bricks, with Doulting stone dressings, the roof being covered with Broseley tiles. The builders are Messrs. CORBY & SON, of Bedford, and the mason's work has been carried out by Mr. EDWARD STEERS, of Bedford. The architect was Mr. RICHARD LUND.

THE GLASGOW ART GALLERY SCHEME.

THE executive of the Glasgow Association for the Promotion of Art and Music have issued the conditions of the preliminary competition of architects for the proposed buildings in Kelvingrove Park. Architects are invited to submit sketch designs for buildings intended to provide accommodation for a central hall, art galleries, museum halls and galleries, a school of art, refreshment-rooms, &c. There will be two divisions of the competition—a preliminary one of sketch designs open to all, and a final one limited to those who may be invited to take part in it. It is directed that the central or music-hall should be the principal feature, its floor space being not more than 12,000 square feet; that the suite of art galleries should provide not less than 2,000 lineal feet of wall surface, in saloons measuring not more than 35 feet in width; that the museum halls and galleries should possess, if possible, 40,000 square feet of floorage, disposed to allow the spacious display of sculpture, antiquities, general art collections, technological and engineering exhibits; and that the school of art should, if possible, possess a floorage area of 12,000 square feet. The sum at disposal is 120,000*l.*, and the committee do not wish to exceed that sum. Mr. Alfred Waterhouse, R.A., has been appointed to act with the committee as assessor, and with his advice the committee will select six from the designs in the preliminary competition, whose authors will be invited to take part in the final competition. Each of the architects so invited will receive 100 guineas, except in the case of the successful competitor, whose premium shall merge in his commission of 5 per cent. for carrying out the work. All designs must be sent in by December 1 next, addressed to Mr. Waterhouse at the City Chambers, Glasgow. The day for sending in designs in the final competition will probably be March 31, 1892.

THE ORIENTAL INSTITUTE, WOKING.

THE members of the Congress of Orientalists paid a visit on Saturday, at the invitation of Dr. Leitner, to the Oriental University Institute at Woking. The Institute, of which Dr. Leitner is the director, and which was established in 1884, occupies the building and grounds formerly occupied by the Royal Dramatic College. It was founded for the purpose of providing natives of the East resident in England with the means of preserving their religion or caste while pursuing their education or official duties; and the Museum, rich in Oriental sculpture, coins and manuscripts, which is attached to the Institute, is of great value to any English student of the languages and peoples of the East. The provision for Hindoo and Mahomedan residents at the Institute has been made with the strictest regard to the requirements of Hindoo caste and Mahomedan rites; and persons of the highest caste are accommodated with a complete set of living rooms for their exclusive use. For the Hindoos a well has been sunk to the depth of 40 feet, and as many of them do not eat meat, a vegetable garden is allotted for their use. The most distinguishing feature of the Institute, however, is the mosque, which has been building for the last two or three years, and which is now completed except for some external decoration. The mosque is not a large one, but it is strictly correct in design, and combines several styles of Oriental architecture. Over the portal is to be engraved the Arabic motto, "An hour of good work is better than a year of prayer." Being the principal and almost the only place of worship for Mahomedans in this country, it attracts besides the residents of the Institute many of the Mahomedan officials resident in England; and on the occasion of the great festivals of Islam it is visited by nearly all the Mahomedans in the country.

Dr. Leitner read a paper on Græco-Buddhistic sculpture, with special reference to the examples in the museum. He pointed out that these discoveries of Greek influence in India fixed a period in the history of art, of religion and of general history. The Greek influence had refined, for it had substituted in India the representation of the noble human face and figure in place of what was supernatural or grotesque. Indian mythology, for instance, would represent our inscience by many eyes; the Greek would represent it by expression. Indian mythology would represent our impotence by many arms; the Greek would represent it by attitude, as it was represented in the sculptures which he had dug up. The question naturally arose—How did the Hindoos learn this art from the Greeks? It was known that a number of sculptors accompanied Alexander the Great on his invasion of India, and it was also known that Alexander's purpose was to inspire India with Greek objects. If this influence should appear, as it undoubtedly did, on the coins, why not also in the sculpture? As examples of what he had found Dr. Leitner mentioned a fresco, representing Buddha's temptation, whereon the virtues and vices were passing in procession followed by Greek, not Indian, soldiers; a representation of the Olympian games, which the natives themselves never played; another of the rape of Ganymedes; and a sculpture of a centaur, a creature unknown to Indian mythology. There was also a carving of a dolphin, and dolphins would certainly not be known to people living so very far from the sea. It was suggested by some that these sculptures might be of Roman or Byzantine origin. But if the influence were ascribable to commercial intercourse, it would naturally be greatest at the seaports, where, however, none of these interesting remains were found. These traces of the Greek were found nowhere but along the routes taken by Alexander, and a hundred miles to either side of these routes they ceased to exist. Dr. Leitner concluded his paper by showing, in the light of the many exhibits on the walls of the museum, how the religious motive entered into native industries and arts; and how that which seemed contemptible or ridiculous was at the very basis of all their best and most characteristic work. To root out heedlessly either the language or the religion of these native races was to ruin them industrially and destroy their possibility of continued national life.

Dr. Blau's collection of Assyrian remains was then inspected, and afterwards commented upon by Professor Oppert, who demonstrated the genuine antiquity of two objects in the collection concerning which there had been some dispute.

THE VALUATION OF LONDON.

THE last assessment of the parishes and unions of the metropolis, the second made under the authority of the London County Council, giving the basis upon which State, municipal and local taxation is raised, has this year been greatly retarded owing to the differences which have arisen between the central and local authorities. These differences have given rise to much litigation, and even now the complete lists have been issued, though in force for this year, "subject to appeals." The London County Council, moreover, is far from satisfied with the valuation system which it has inherited, and which has been in work in London since the passing of the Metropolis Valuation Act, 1869, the carrying out of which was committed to the late Mr. Jebb, the clerk of the Metropolitan Asylums Board, a body which, apart from the Metropolitan Board of Works, was the only central authority for all London when the Act was passed. This dissatisfaction of the London County Council in revising the local assessments is shown by the fact that the County Rate Committee are taking steps to bring about in London what the Council call "fair and equal assessments."

The details of the assessments so far made are of general public interest, and especially when compared with the assessments of the previous year. The "gross" is the Queen's taxes valuation, and the "rateable" the general assessment. The City of London Union, which has 109 separate parishes, together with Serjeants' Inn, Fleet Street, Thavie's Inn and Whitefriars Precinct, but excluding the Middle and Inner Temple, which are separately assessed, has a gross value of 4,889,020*l.*, and a rateable value of 4,063,211*l.*, as against 4,627,090*l.* and 3,822,571*l.* respectively last year. In regard to the other parishes and unions, the assessments are in alphabetical order and are as follows:—Bethnal Green—gross value, 519,920*l.*; rateable value, 425,504*l.*; against 498,798*l.* and 406,027*l.* respectively. Camberwell—gross value, 1,275,407*l.*; rateable value, 1,030,046*l.*; against 1,274,255*l.* and 1,032,763*l.*—a slight decrease. Chelsea—gross value, 820,669*l.*; rateable value, 689,542*l.*; against 772,714*l.* and 647,584*l.* Hampstead—gross value, 805,541*l.*; rateable value, 669,765*l.*; against 767,639*l.* and 638,811*l.* Islington—gross value, 2,025,631*l.*;

rateable value, 1,686,385*l.*; against 1,994,726*l.* and 1,651,464*l.* Kensington (St. Mary Abbott's)—gross value, 2,390,718*l.*; rateable value, 1,999,763*l.*; against 2,283,114*l.* and 1,913,523*l.* Lambeth—gross value, 1,868,224*l.*; rateable value, 1,517,810*l.*; against 1,838,826*l.* and 1,490,716*l.* Mile End Old Town—gross value, 465,931*l.*; rateable value, 377,470*l.*; against 464,056*l.* and 368,825*l.* Paddington—gross value, 1,572,323*l.*; rateable value, 1,322,982*l.*; against 1,518,471*l.* and 1,276,577*l.* Shoreditch—gross valuation, 832,296*l.*; rateable value, 682,328*l.* (the latter figures altered on appeal from 678,428*l.* rateable only); against 794,141*l.* and 644,844*l.* St. Marylebone—gross value, 1,805,500*l.*; rateable value, 1,510,051*l.*; against 1,718,802*l.* and 1,435,340*l.* St. Pancras—gross value, 1,939,968*l.* (altered on appeal from 1,931,815*l.*); rateable value, 1,609,702*l.* (altered on appeal from 1,615,915*l.*); against 1,869,987*l.* and 1,555,152*l.* St. George's-in-the-East—gross value, 233,615*l.*; rateable value, 186,826*l.*; against 230,574*l.* and 181,373*l.* The Union of St. Giles's and St. George's (Bloomsbury)—gross value, 483,229*l.*; rateable value, 403,587*l.*; against 458,121*l.* and 382,491*l.* Lincoln's Inn, which is assessed by the committee of the St. Giles's Union—gross value, 25,018*l.*; rateable value, 20,904*l.*; against 25,305*l.* and 21,149*l.* St. George's (Westminster) Union, comprising the parishes of St. George (Hanover Square), St. Margaret and St. John, and the Close of the Collegiate Church of St. Peter—gross value, 3,058,467*l.*; rateable value, 2,612,110*l.*; against 2,943,452*l.* and 2,457,837*l.* The Fulham Union (comprising Fulham and Hammersmith)—gross value, 1,176,100*l.*; rateable value, 964,806*l.*; against 1,090,812*l.* and 896,088*l.* The Greenwich Union (comprising Greenwich parish, St. Paul, Deptford, and St. Nicholas, Deptford)—gross value, 1,004,466*l.*; rateable value, 828,396*l.* (the last figures including sums for the three parishes of 9,125*l.*, 6,787*l.* and 2,200*l.* in respect to Government property, which is not assessed to "gross" value); against 969,221*l.* and 778,101*l.* The Hackney Union (which includes St. Mary, Stoke Newington)—gross value, 1,408,584*l.*; rateable value, 1,154,171*l.*; against 1,412,242*l.* and 1,141,108*l.* The Holborn Union (including St. Andrew above Bars, St. George the Martyr, Queen's Square, Furnival's Inn within and without the City, St. Sepulchre, the Liberties of Saffron Hill, Hatton Garden and Ely Rents, Staple Inn, the parishes of St. John's and St. James's, Clerkenwell, the parish of St. Luke's, Old Street, and the Liberty of the Charterhouse)—gross value, 1,278,452*l.*; rateable value, 1,050,371*l.*; against 1,251,216*l.* and 1,038,165*l.* Gray's Inn (which is assessed by the committee of Holborn Union)—gross value, 19,307*l.*; rateable value, 16,146*l.*; against 19,240*l.* and 16,067*l.* Lewisham Union (comprising Lee, Eltham and Lewisham)—gross value, 813,410*l.*; rateable value, 672,802*l.*; against 803,505*l.* and 661,589*l.* Poplar Union (including St. Mary, Stratford, All Saints, and St. Leonard, Bromley)—gross value, 923,677*l.*; rateable value, 692,705*l.*; against 904,523*l.* and 671,211*l.* St. Olave's Union (including the Southwark parishes of St. Thomas, St. Olave, St. John, Horselydown, St. Mary, Rotherithe and St. Mary Magdalen, Bermondsey)—gross value, 1,075,672*l.*; rateable value, 846,682*l.*; against 990,660*l.* and 792,199*l.* St. Saviour's (Southwark) Union (comprising the other Southwark parishes of Christ Church, St. George the Martyr, St. Saviour and St. Mary, Newington)—gross value, 1,324,854*l.*; rateable value, 1,080,190*l.*; against 1,296,214*l.* and 1,049,400*l.* Stepney Union (including the parishes of Shadwell, Limehouse, Wapping and the hamlet of Radcliff)—gross value, 371,824*l.*; rateable value, 295,248*l.*; against 377,014*l.* and 296,655*l.* The Strand Union (including St. Martin's-in-the-Fields, St. Paul, Covent Garden, the Precinct of the Savoy, St. Mary-le-Strand, St. Clement Danes and the Liberty of the Rolls)—gross value, 1,101,262*l.*; rateable value, 908,417*l.*; against 1,035,582*l.* and 864,295*l.* The Wandsworth and Clapham Union (including the parishes of Clapham, Tooting Graveney, Streatham, St. Mary, Battersea, Wandsworth and Putney)—gross value, 2,217,140*l.*; rateable value, 1,813,346*l.*; against 2,093,743*l.* and 1,689,901*l.* The Westminster Union (St. Anne's and St. James's)—gross value, 1,053,759*l.*; rateable value, 879,628*l.*; against 1,010,859*l.* and 841,952*l.* The Whitechapel Union (including the Precinct of the Old Tower Without, the parish of Holy Trinity, Minories, the Liberty of the Old Artillery Ground, the hamlet of Mile End New Town, the parish of St. Mary, Whitechapel, the Liberty of Norton Folgate, the parish of St. Botolph (without), Aldgate, the Precinct of St. Katharine and the parish of Christ Church)—gross value, 494,257*l.*; rateable value, 403,282*l.*; against 458,676*l.* and 371,189*l.* The Woolwich Union (including Charlton, Kidbrooke, Woolwich and Plumstead)—gross value, 516,569*l.*; rateable value, 481,200*l.* (including 66,803*l.* in respect to assessment of Government property); against 450,929*l.* and 351,422*l.* The Middle Temple—gross value, 17,739*l.*; rateable value, 14,782*l.*; against 18,608*l.* and 15,491*l.* The Inner Temple—gross value, 27,105*l.*; rateable value, 22,805*l.*; against 27,122*l.* and 22,697*l.* The hamlet of Penge, which is in the county of London, and forms part of the Union of Croydon, but is assessed for the purpose of the county rate, is rated at 148,799*l.*, against 150,385*l.* last year.

The total gross value of the county of London for this year is given as 39,835,700*l.*, without the Government property; and the rateable valuation, including Government property valuation, as 33,881,766*l.* Last year the gross value was 38,462,493*l.*, and the rateable value 31,592,387*l.* The rateable value of Government property in the whole is 168,190*l.*

It will be seen that the increases are general over the metropolis, and the decreases, attributable to local circumstances, very few and small in amount. The increase of this year over last year—more than 2,000,000*l.*—is a distinct advance upon the increase of last year with the year preceding, when the increase was comparatively slight. The following table shows the increases from 1874 until the transfer of this duty of issuing the assessments to the London County Council:—

Year.	Valuation.	
	Gross estimated rental.	Rateable value.
1874	£25,148,033	£20,672,765
1875	25,574,366	21,019,507
1876	27,602,649	22,763,087
1877	28,464,833	23,444,876
1878	29,027,795	23,912,681
1879	29,682,269	24,447,444
1880	30,421,071	25,057,781
1881	33,384,851	27,544,446
1882	33,855,917	27,973,978
1883	34,470,725	28,438,385
1884	35,100,704	28,954,020
1885	35,689,244	29,410,489
1886	37,027,516	30,446,336
1887	37,361,895	30,720,646
1888	37,730,300	31,005,876
1889	38,028,506	31,244,495

This table includes the last returns made by Mr. Jebb.

The County Council, in a paper sent out by the rating authorities, points out that London is the only county in England in which the central rating authority has to levy a rate upon valuations which it has no power itself to make, revise or alter. In every other county the County Council has the control of the valuations, upon which the county rate is based. In London the order of things is reversed. Instead of one assessment or rate committee there are a vast number of assessment committees, no less than thirty, appointed in the various districts by the guardians or vestries. These assessment committees revise and settle the valuation lists prepared by the overseers in their several districts, and, subject to appeals to the Sessions, the lists so settled by them are to be "conclusive evidence" of the gross and rateable value of all properties included in them, "and of the fact that all hereditaments required to be inserted therein have been so inserted," not only for the purpose of the poor-rate and of the local rates levied by vestries and district boards, but also for the county rate, and for the police and School Board rates or precepts. The London County Council therefore have no voice and no power to settle, review or alter the valuations upon which their rates must be based.

This arrangement is cumbrous, expensive, antagonistic to uniformity, and incapable of being satisfactorily grappled with by the Council under its present powers for the purpose of making "a fair and equal county rate."

Where the real rating authorities—namely, the assessment committees—are so numerous, differences in the mode of valuation will abound. The gross values are reviewed by the surveyors of taxes, but these officials have usually no technical knowledge to assist them in checking those values, and startling differences have been found to exist as the result of the varying points of view of different assessment committees. And even where the gross valuation is fair, the rateable values have been found in hundreds of cases to depart from the scale authorised by the Valuation Act. This was plainly shown by the report of the Local Government and Taxation Committee presented to the Council on January 13 last, although the case made out in that report would, in all probability, have been much intensified had not the great pressure upon the valuer's time, and the lack of proper powers to pursue his investigations, prevented him from making more than a very imperfect examination of the various lists.

The Committee, after giving a detailed report of the modes of changing the system which they suggest for the consideration of the local authorities, set forth amendments they propose in the Metropolis Valuation Act. They also say that "their object is not to increase assessments, but to bring all assessments into line with each other, so that the 67·5 of central rates should be levied equitably among the parishes all over the county."

AN ANCIENT DIVISION OF LAND.

ONE of the papers read at the meeting of the Cumberland and Westmoreland Archæological Society was on the ancient division of land known as "Rigg and Reànn," of which an example continues at Rockliffe, near Carlisle. Mr. T. Hesketh Hodgson said that the field, with its singular divisions into long strips, separated by balks or raines of turf, was an interesting survival, the only one, so far as he knew, in that neighbourhood, of a system of land tenure and cultivation which was of extreme antiquity and which had prevailed over a widely extended area. It was recognised as still existing in the east. Our Aryan ancestors carried it westward to the shores of the Atlantic, and even beyond the Atlantic traces of it might be found, for it was on record that the earliest English emigrants organised their homes in New England on the model of what we now know as the village community. Marshall, a voluminous writer on agricultural subjects about one hundred years ago, says that very few centuries ago nearly the whole of the lands of England lay in an open and more or less commonable state. Round the homesteads in which the tenants resided lay a few small enclosures or grass yards for the rearing of stock; round the hamlet lay a tract of arable fields, and in the lowest situations lay an extent of meadow ground to afford a supply of hay for the winter and spring months, while on the outskirts of the whole, or where the land was not adapted for cultivation, were the common pastures for the summer grazing of the stock belonging to the community. The arable land was laid out in great open fields, usually, though not invariably, three in number —sometimes two or four; but for the sake of brevity we will now consider only the three-field system. Each field was divided into strips of 40 rods in length and usually about four rods of 5½ yards in width, or about a statute acre, separated by ridges of turf known as balks, or locally, raines; while along the head of each series of strips ran a broad band of turf, the headland or field way, on which the plough was turned when it did not by custom turn on some other tenant's land, and which served as a road to the various strips in the fields. Corners, which from their shape could not be laid out into the usual acre or half-acre strips, were sometimes divided into tapering strips called gores or gored acres, and sometimes pieces of unused land remained which from time immemorial have been known as "No man's land," "Any man's land," or sometimes "Jack's land." These strips were allotted in rotation to a certain number of the dwellers in the townships, a very common holding being that known as a virgate, or yardland of thirty acres, in which case each holder of a virgate would possess a number of strips scattered through the open fields, ten acres in each, in apparent disorder until the key of the confusion is found in the order of rotation. These strips were not cultivated according to the will of the owner, but according to a settled rotation, fixed, by long custom, of "little grain," that is, winter crop, wheat or rye; "'etch grain" or spring crop, barley, oats, beans or pease and fallow. Turnips or potatoes, so important in modern husbandry, were then unknown. Between harvest and seedtime the cattle of the community enjoyed pasturage in common over the whole of the open fields, and during the whole of the year over the field which in its turn was in fallow. The long meadows were subject to a similar rule. They were enclosed about Lady Day for the hay harvest and assigned in similar strips, often in the rotation shifting by lot, whence they are often known as lot meadows. After Lammas the fences were thrown down and the meadows were open as common pasture until the enclosure of the following spring. The cultivation was by a common plough team, to which each holder contributed according to his holding. The full plough team was eight oxen, to which the holder of a virgate of thirty acres contributed two; the holder of a half virgate, bovate or oxgang, one. The smaller holders doubtless gave their labour towards the common cultivation. The connection of the holding with the Mediæval land measure, the carucate, or land which would be cultivated by one plough team, was obvious. The carucate, usually of virgates, was 120 acres—the acre varying in size according to the nature of the land, and so the carucate is found to vary from 80 to as much as 200 statute acres; but it is always the land which could be cultivated by one plough team, and contains always four virgates. The form of these strips was determined by long usage, which fixed the distances traversed by the plough before turning; and so invariable was this distance that it has left its mark on our language in the word "furlong," which is, of course, simply "furrow long"; while its measure of 40 rods, or 220 yards, is shown to be of immemorial antiquity by the use of the Latin word "quarrantena" for furlong. The width of the strip was determined by the day's work of the plough, which, probably by experience, was fixed at 4 rods, or 22 yards, with sufficient regularity to give rise to the measure of area which has finally settled into our statute acre of 220×22 yards, or 4,840 square yards. Probably the varying quantity, which according to the nature of the soil could be ploughed in a day, gave rise to the old local acres, which frequently differed from our present statute acre. The practice has also left its mark on our language in the word "darrick," or "day's work," which is not even yet wholly obsolete, for in 1882 an advertisement appeared in the Carlisle papers of land for sale, among which was some described as "3½ darricks in open dales"—dales, of course, meaning shapes or divisions. Doubtless the strips in the field now before them were once laid out in this manner; they would, of course, be more numerous, and be approximately of the same size; but obviously they tend to diminish in number, as whenever two contiguous strips came into the hands of the same proprietor, the "balk" or "raine" would be ploughed up and the strips thrown into one. The field was now in the hands of two proprietors only; probably ultimately the whole of the balks would disappear. The word "reine" is simply a modern German word for balk—butts or riggs, crossing the ends of the other riggs which abut upon them, the field way, the meadows, at the low end of the riggs, the common for pasture and the closes lying around the homesteads. The size of the riggs is very nearly uniform, generally one acre, but always bearing a definite relation to that measure, one, two or three roods. To us it seems a most cumbrous and extravagant system; the waste of time in getting about, the constrained rotation of crops, the difficulty in getting the land clean where it could be sown with weeds blown from the strips of a careless owner, the quarrelling about headlands and rights of way, seem to make it almost impossible of working. Yet, though there is ample evidence of the jealousies and heart-burnings to which it gave rise, there is also evidence that the enclosures necessary to amend it gave rise to much discontent and were bitterly opposed; and there appear in the schemes now put forward by certain so-called land law reformers some indications of a wish to revert to something very nearly resembling this most inconvenient and now happily obsolete form of cultivation.

LECKHAMSTEAD CHURCH.*

THE name Leckhamstead is derived from the word *lec*, a lake or marsh, and *ham-stead*. The parish is bounded on the north by Whittlebury Forest, on the east by Wicken and Thornton, on the south by Maids Moreton and Thornborough, and on the west by Akeley and Lillingstone Dayrell. Its extent is about three miles from north to south, and one and a half from east to west. Its area is about 2,800 acres, of which 733 are meadow, 1,467 pasture, 400 arable and 130 wood. In Domesday Book there are three manors in Leckhamstead, besides two subordinate estates:—(1) Held of Odo, bishop of Bayeux, by Gilbert Maminot—formerly by Earl Leuuin; (2) held of Walter Giffard, by Hugh (probably surnamed De Chastillon); (3) held by Geoffrey de Mandeville. (2) and (3) had been held before the Conquest by Suartin, Asgar's man. On the death of the second Walter Giffard, Hugh de Chastillon became tenant in chief of his land in Leckhamstead to Henry I. Meanwhile Odo's land (1) was forfeited and regranted to Geoffrey de Mandeville, the Maminot family retaining possession. And, finally, by the marriage of Beatrice de Say to William, heir of the Maminots, and his enfeoffment to Hugh de Chastillon, the three great manors came into the hands of the latter in the time of Richard I., when Hugh de Chastillon gave lands and a messuage to Luffield Priory at a quit rent of five shillings a year. The Chastillons remained lords of Leckhamstead until the reign of Richard II., when, in 1398, their estates passed either by purchase or affinity to the Guernons. Soon after 1467 Joan Guernon carried the estate by marriage to the Tilneys; and her grandson apparently, who died in 1520, left an heiress, Joan, the wife of Richard Greenway, of Dinton, whose son Anthony married the daughter, by a former wife, of Joan's second husband, Michael Harcourt, who was member for Buckingham in 1584, and died in 1594. Anthony succeeded to the estate on his mother's death in 1600, died in 1619, and is buried in the chancel of Leckhamstead Church. His son Anthony, who was joint patron with his uncle, the second Michael Harcourt, conveyed the estate to Edmund Pye and his son, who also held Bradenham Manor. His heiress married the third Lord Lovelace, whose daughter inherited the estate. Then the manor went to the Cleveland branch of the Wentworths by marriage, and Lady Ann Wentworth married Sir Henry Johnson, who died without issue in 1719. She pulled down the old manor-house, and dying in 1745, left the estate to Martha, sister to Lord Lovelace, who married Lord Henry Beauclerk. At her death the manor descended to the Rev. Henry Beauclerk, whose son, the owner of the estate and incumbent, was succeeded by John Beauclerk, of Whittlebury.

Another manor, Leckhamstead Parva, or Lymes End, passed

* A paper read by the Rev. H. C. Tompkins, at the visit of the Buckingham Archæological Society, and published in the *Bucks Advertiser*.

by fine from Hugh Mortimer, 1413, to the Tyrrells of Thornton. They built Toy Mansion in this parish in 1603, which cost 3,000*l.* Its name is still preserved in Toy Ground. In 1730 it passed to the Pollards by purchase.

Another subordinate manor, of "Heyburn Fields," was the property of the Greens till 1500, and passed from them to the Wentworths of Lillingstone Lovel, by whom it was bequeathed to Martha, wife, above mentioned, of Lord Henry Beauclerk.

The parish of Leckhamstead was enclosed in 1630. The rectory in 1291 was valued at 24 marks, and in 1534 at 15*l.* 3*s.* 4*d.* Among the rectors were (1) John Antre or Dantre, presented in 1375 by Sir Hugh Chastillon, by some identified with John Wicliffe. But according to the registers John Wicliffe, presented in 1371, died December 31, 1384, "etiam Rec. de Lutterworth." "He taught against mass, &c., tenets of ye Paptists, bred at Oxon, and drew many persons of note after him." Probably therefore as John Wicliffe never resided here, because he was also rector of Lutterworth and Ludgershall at the same time, Dantrey was his curate-in-charge. (2) In 1432 was presented Adam Molens, LL.D., *etiam Dominus huiusce manerii.* He was Bishop of Chichester in 1445, and murdered at Portsmouth in 1449. (3) October 25, 1432. Thomas Send, resigned and instituted three times. (4) November 14, 1472. Thomas Brigge, presented by Edmund Reade, Kt., and Thomas Walden. *Generoso estimato commissario fidei Guernonis* (*Anglice Feoffee*).

The church is dedicated to the Assumption of the B.V.M. The dimensions of the nave are 70 feet by 24, of the chancel 30 feet by 17, and of the aisle 70 feet by 12. The earliest church of which traces remain was built in the twelfth century, and consisted of the present nave, with a chancel eastward. But very shortly afterwards, and perhaps even before the church was finished, a north aisle or manor chapel was added, communicating with the nave by a remarkable arcade cut through the wall. Two fragments of the original painting of this church have been preserved on the piers of this arcade. One of them represents a cross, with the words—

✠ AVE MARIA; the other has Hic sedet ISABELLA,

marking the position of this lady's seat. Similar notices have been found elsewhere. This manor aisle was very probably screened off formerly from the nave by a parclose, like that mentioned in the Paston Letters, 1451. "On the Sonday before Sent Edmond, after evyn songe, Augnes Ball com to me to my closett and bad me good evyn, an Clement Spycer with her. And all that time Waryn Herman lenyd over the parklos and lystynd what we seyd."

The effigy of a knight, which lies under the western arch of the aisle, probably represents one of the Chastillons who held the manor and built this church, but it has no inscription. The mouldings of the arcade are remarkable, and especially the grotesque heads upon the keystones, each one more and more turned eastwards as it is further from the chancel. The present rood-door replaces an earlier one, of which the sill remains; there are three steps in the thickness of the wall, and the rest were of wood, descending into the aisle as at Lillingstone Lovel. The doors of the Norman church are very good; that on the north, like the aisle arches, has a head on the keystone, and one of its mouldings recalls the ornament on the font at Maids Moreton. The south door is more elaborate, with grotesque capitals above patterned columns, one of which has a head worked on the shaft below the capital; in the tympanum is a relief representing two dragons struggling over a human soul. The porch over this door was built to commemorate a visit of William Laud, then Bishop of London, in 1628.

To the Norman church already described, a tower was added in the succeeding century, and two windows were replaced in the south side of the nave; these were restored entirely in 1871. A new chancel was built in the thirteenth century with an original north door, now communicating with the modern vestry. The piscina is original, and the low rude arch near it was probably intended to cover sedilia. In the fourteenth century the tower was restored and new windows were inserted in the aisle. The font is octagonal, of Decorated workmanship, and contains in its panels:—(1) The Madonna crowned and Child under a canopy; (2) St. Catharine, though she has St. Margaret's emblems also; (3) a vine attacked by a boar, symbolising persecution, for "the wild boar of the wood doth root it up"; (4) a bishop in the act of benediction; (5) a vine with our blessed Lord's face; (6) the Crucifixion, with two mourning figures; (7) a very curious pattern of leaves and beaded bands, which seems to contain two periods of work; and (8) four small roses or ornamental studs. The tiles in the chancel are copied from one found at the restoration, with the inscription *Laus Deo*; others bear the emblematic fish and the dove. There is a peal of three bells dated 1662 and 1664, and a saint's bell, which is cracked. A brass to a member of the Tilney family (1503) lies in the aisle. In the chancel there is fixed to the north wall "a very extraordinary stone," as Browne Willis says, "and this misearebly inscribed on it—'Heare lieth Sir Anthony Greenowaye Knight. Jan. 26, 1619. He being lord of the manor in 1600.'"

Lipscomb says, "On north side, affixed to door, is a bust of wood, with features rudely sculptured; a long, ill-favoured visage, with a short beard." Might it not be a figure of John Wicliffe? No trace of it now. Lipscomb further says, "At the east end of aisle is a pew, in the middle of which is the old communion table, removed out of chancel during Protectorate of Cromwell, and ever since remaining in its present situation, being used by inhabitants at their vestries." The noticeable feature about it is that it is all pegged together, having no nails or screws. Lipscomb says there was a window in east end of aisle of two cinquefoil-headed lights, having a quatrefoil in the spandrels or subarchitrave with indented mouldings.

A clock, formerly belonging to this church, was sold to the parish of Wicken before Browne Willis's time. The church plate consists of (1) a chalice of 1569, parcel gilt, of the usual Grindal pattern; (2) a silver paten of 1789; (3) a flagon of 1793, from the same silversmith; and (4) a very beautiful silver alms dish, nearly hemispherical, with two embossed handles and an oak-leaf pattern on the bowl. There is a rare maker's mark, but no hall-mark; so the vessel is probably of foreign workmanship.

PREHISTORIC REMAINS IN SOUTHERN INDIA.

A PAPER was read at the Congress of Orientalists by Mr. F. Fawcett, on "Remains Discovered near Bellary, in Southern India." He said:—It has been known for some time that Bellary and its neighbourhood was a centre of the stone-folk. The stone of which they made their implements is there in abundance. In his "Notes on Some Recent Neolithic and Palæolithic Finds in South India" (printed in the journal of the Asiatic Society of Bengal, vol. lvi. part ii. No. 3, 1887), Mr. Bruce Foote, F.G.S., superintendent of the Geological Survey of India, writes:—"Kapgal" (a hill five miles north-east of Bellary) "had evidently been a settlement of the stone-folk for a considerable period, and an important centre of celt manufacture. The traces of residence were very numerous in the shape of small terraces revetted with rough stone walls, great accumulations of made ground full of ashes and broken pottery, and containing many implements of all sorts, a large proportion of them damaged, many so much so that they had evidently been rejected as useless. Bones of bullocks, chiefly broken, occur pretty numerously, and especially in the ashy parts of the made ground. Other traces of residence were small tanks made by damming up the little stream which drained the northern side of the hill. Large blocks of the local granite-gneiss had been hollowed for some purpose or other, and so well worn by use, or purposely fine-tooled, that the inner surface was all but polished. The signs of manufacture of implements found on Kapgal consisted of large numbers of unfinished celts in all possible states of completion, and great quantities of flakes struck off from the selected fragments of rock in the process of fabrication. The stone to be worked was procurable on the hill. It is a fine-grained pale greenstone (diorite?) which occurs here and there in irregular bands of some thickness within the mass of a huge dyke of coarse black diorite that runs along the northern slope of the hill parallel with its axis." The notes contain much valuable information, and I would refer those interested in Indian prehistorics to them.

The hill was inhabited to the summit, and all over it and in the surrounding fields may be picked up almost any number of stone implements—celts, mealing-stones, scrapers, chisels wide and narrow, pounders, corn-crushers, &c., of various excellence of finish and in various states of manufacture, but generally damaged, also quantities of broken pottery, some finely glazed. With two friends, Mr. Robert Sewell, M.C.S., and Mr. Hubert Knox, M.C.S., several excursions were made to Kapgal and Bellary Hills in June last, and in one of the first was made the discovery which it is the purpose of this paper to announce. It seemed as if all we could find in the way of relics would, after all, tell little or nothing of the habits, customs, beliefs—the life, in fact—of those who had lived on the same ground in the far-away ages; but here on Kapgal were found, most unexpectedly—for existence of anything of the kind in India was unknown—rock pictures which may give us a glimpse into their lives. They were not seen before because no European had been where they are. Crossing the trap dyke, where the rocks are piled one on the other, all the earth having been washed away by rain, I noticed a picture engraved on the perpendicular smooth surface of a rock. "Was it the work of prehistoric man?" We thought it was; and we searched and found many pictures on the rocks. At this place are terraces on the solid rock; all about are hollows in the rocks, large and small, as if they had been used for polishing, smoothing or sharpening implements, grinding corn, &c.; and there are quantities of flakes and other signs of work. Here and there is the semblance of a

picture arousing keen interest, which is completely baffled by approaching for close examination, for on going close up to it little or nothing can be seen, it being much plainer from a certain distance—15 feet to 25 feet. In two pictures we see the bow and arrow used for hunting. "How were the arrows tipped?" No stone arrow-head has yet been found in South India—not further south than Chota Nagpore. It may be they were tipped with hard wood, as are those arrows, very serviceable ones, which I got from a Kâni in Travancore. The Kânis, a pygmy Dravidian tribe of the Travancore forests, use such arrows for hunting, though they use iron for their knives and even for their fish spears, which they shoot from a bow. It is known, of course, that iron arrow-heads have been found in the cromlechs which are so common in South India. I have myself found a well-shaped one.

But as for the pictures generally and their meaning, I will hazard no theory at present, for there has been no time for their examination. It is evident that many of them are done over much older ones, which have been almost obliterated, perhaps by time. However, as it may naturally be asked, "What are the reasons for presuming that the pictures are prehistoric?" I am bound to give such reasons as I can now. They are in a place which was certainly inhabited by the stone-folk, and nowhere else. Their origin is ascribed by the Hindoo villagers of the neighbourhood to a god, Vitlappa by name, and the fact of their being appreciated as the work of a supernatural being may be taken as strong probability that they are ancient. The reasons are obvious to those who know the Hindoos. The picture representing Vitlappa may have been sacred to the prehistoric folk as it is now to the Hindoo villagers. It is the only figure about lifesize, by far the most carefully drawn, and it is on a sloping rock facing the east, so that the sun shines on it at sunrise. The head of the figure is almost covered by a patch of some hard pitchlike substance, removal of which would have offended the devotees of Vitlappa, who believe he can withhold the rain and plague them if offended. If it was sacred so too, perhaps, was the snake figure on the same rock. Seven strokes from the head tell us it represents a seven-headed snake. Snake worship, just noticed by Mr. Fergusson, is very common in South India. It pervades the religion. In the Bellary district there are numbers of snake-stones (*i.e.* snakes figured on stones) at every well, and piles of them offered by votaries at shrines and other sacred places. Like all the human figures in the pictures, Vitlappa is unclothed. This suggests that the people of the pictures were innocent of clothing, and that the picture of Vitlappa is pre-Hindoo, for no Hindoo god is represented nude. Then there is the character of the pictures—I say nothing of the fact that the animals depicted do not exactly represent any now found in that part of the country—and there are no conventional shapes. The representations of the feet-marks or impressions, though very similar to those we see in the oldest Hindoo pictures, and which are drawn or carved now as they ever were by Hindoos, and of which one form survives in the symbol painted on the forehead of the follower of Vishnu, are not quite in the conventional style. In another photograph may be seen a Nandi (Siva's bull), engraved by a modern artist almost in the conventional shape, which is the same on the old coins as in this idol made the other day. In another photograph may be seen a cart, also modern. There are many specimens of such work which imitation easily accounts for, but which cannot be mistaken for the work imitated. The modern work—probably done by mischievous cowboys—is chipped on the surface of the rock, while the older is bruised into it. The dog, hyena (or tiger?), ox, antelope, leopard, elephant—or what look like these—and other animals appear in the pictures, but no horse. We see the horse depicted in the Amravati sculptures, which are the most ancient in South India, and commonly in all Hindoo pictures. In almost every village in the Bellary district ancient heroes, represented on stones, are common objects of worship, and the chief hero is generally on horseback to express his dignity and greatness. These hero-stones are certainly old. It seems probable the horse was not known to those who made the picture. Some of the pictures, on rocks under rocks which have not been disturbed for long ages, are upside down, and some are perpendicular.

Unless we suppose they were intentionally drawn so—and we cannot—we must be inclined to the belief that they were drawn as only any rational being would draw them, and that the rocks were afterwards subverted. That there was some displacement of the rocks is most probable, for some of the pictures could not have been done were the rocks as they are now without the aid of scaffolding, and that such was used is not likely. This, too, helps to banish any probability of the pictures having been done by Hindoos, who would not take the trouble to clamber over steep rocks and put up scaffolding to bruise pictures on very hard rocks for no conceivable purpose. Such work would be aimless too, for the pictures show no facts of Hindoo life or religion. But they show, it is hoped, something of what has hitherto been behind the veil; for we can no more suppose that prehistoric man made fictitious pictures than we can suppose he made them solely for decorating his habitations. It is not possible to do more than mention the fact of the existence of most curious mounds at the foot of Kapgal, which we sectioned. In South India the investigator of things ancient has a splendid field to work in, plenty to do and plenty to get. The amateur is a fly on the Government wheel, and, however zealous, has little time for indulging his hobbies.

After the reading of Mr. Fawcett's paper, Dr. Leitner proposed, and the meeting carried by acclamation, a resolution that "a commission be formed, composed of MM. Cartailhac, Hein, Beddoe, Garson, Lewis and Brabrook, for the further investigation and prosecution in their various anthropological aspects of the discoveries made at Bellary in connection with their linguistic, ethnographical and antiquarian points of view."

ARCHÆOLOGY OF THE UTTOXETER DISTRICT.

THE Archæological Section of the Midland Institute held the last excursion of the season recently, when some of the places of interest in south-east Derbyshire were visited. Arriving at Uttoxeter, the party drove through the town and across the valley to Dove Bridge—an ancient structure of six quaint arches—which was examined with much interest. On the Derbyshire side of the river the original pointed ribbed arch remains, but the rest appear to have given place to plainer pointed arches of the fifteenth century and semicircular ones of the seventeenth, the whole making with its huge projecting piers, grey with age and lichens, reflected on the broad surface of the Dove, a scene of much beauty, apart from its antiquarian interest. At this point the party left the carriages and struck across Doveridge Park by a footpath near the river. On the left, crowning a steep bank, Doveridge Hall, an imposing mansion of early eighteenth-century character, which is owned by Lord Waterpark and occupied by Lord Hindlip, commands a fine view across the Dove valley, towards the town of Uttoxeter and Bagots Park. In a few minutes an old flour-mill was reached, whose quaint gables and fine group of mossy undershot wheels formed a capital subject for the cameras which were soon levelled at it. A mill is recorded to have stood here in the time of the Domesday Survey, but no part of the present building is older than the seventeenth century, and much of it still later. On ascending a short but steep hill, the party were received at the church by the Rev. Canon Hamilton, who pointed out the more interesting features of the building. Doveridge Church has a fine double arcade and north and south aisles of later style, and among its monuments are a fine incised slab, with a priest in the eucharistic vestments, and a very large and well-preserved mural group to a member of the Davenport family, erected early in the seventeenth century, and having two large kneeling effigies, several small ones, and a child reclining in its cradle. A beautiful silver chalice dated 1619, a fine iron-bound chest, several late brasses, the earliest copy of the register, dated 1575, and a mutilated thirteenth-century cross in the churchyard were also seen. Shading the latter with its immense branches was an aged yew of extraordinary girth, the limbs of which cover so extensive an area that they have had to be supported by quite a labyrinth of props. After luncheon the party drove to Somersall Herbert, where the timber manor-house of the ancient family of Fitzherbert was visited. Here, by the courtesy of Major Fitzherbert, who conducted the visitors in person and explained the less obvious points of interest, a close and appreciative inspection of the interior and exterior of this delightful house was enjoyed. Somersall Hall has all the venerable outward aspect which so many ancient buildings lack. The tall gables, of different sizes and elevations, the timber-work with its quatrefoil enrichments, the variously-tinted plaster, are all untouched by the restorer, and guiltless alike of tar and whitewash. The rector of Somersall (the Rev. Reginald Fitzherbert) explained the features of the church, which is in close proximity to the hall. They include a fine and unusually perfect churchyard-cross, very richly-carved Norman font, and a fine but mutilated freestone effigy of a priest holding a chalice, probably early fourteenth century. From Somersall Herbert the drive was continued to Sudbury Church, which stands near to Sudbury Hall. Though reduced in interest by a thorough restoration, there are many remains in the ancient church, including a Norman door and window, two fine thirteenth-century stone effigies to the Montgomerys, and two picturesque monuments to the Vernons, of seventeenth-century work. Passing through a fine doorway in the garden wall, bearing some initials and the date 1626, a delightful scene was visible from the terrace on the garden front of the hall, an imposing Jacobean palace, which commands a magnificent prospect across a large lake to the distant forest of Needwood. By the kindness of Lord Vernon, the interior of the hall was also visited. Passing round to the front entrance, which faces a very extensive park, the drawing-

room, saloon and other principal rooms, to the grand staircase, were passed through in succession, and the gorgeous ceiling decorations and many fine pictures were examined. Among them are gems by Rembrandt, Vandyke, Rubens and Murillo, and many old family portraits—Romneys, Gainsboroughs, Lelys, &c. Some fine tapestry in the state bedrooms, carving by Grinling Gibbons, and in the long gallery, besides many old portraits, a number of literary treasures were pointed out by the Dowager Lady Vernon, among others the richly-illuminated copy of the "Romaunt of the Rose," which was presented by Francis I. of France to Henry VIII., a complete series of the priceless original folios of Shakespeare's works, early copies of the Koran, and the celebrated Rhyming Chronicle of the Vernon family, written in 1615 by John Harestagg, their faithful steward.

LILLINGSTONE DAYRELL CHURCH.*

I WELCOME you to my church, which is a very interesting one on account of its antiquity. You will, I am sure, not regret the visit you have now paid to it. On your last visit to this northern part of the county, which took place on August 11, 1884, you had intended to visit this church, but were unable to do so from want of time and the greater attractions of Stowe House.

I will now relate to you the information I have been able to gather about this church, and I confine myself entirely to details about the building, though there are other interesting matters relating to the history of the parish which can be traced back before the Norman Conquest. The church is dedicated to St. Nicholas, bishop of Myra, patron of pawnbrokers and schoolboys, whose day in the calendar is December 6. It is not known at what precise date the church was built, or whether there was one here in Saxon times. Some have contended that there was one at that early period, but this seems uncertain. However, as there appears to have been a rector appointed here about the year 1198, it is reasonable to suppose that a church had been built here by that time, if one had not existed before. This church bears marks of an early date, probably of the eleventh century. It probably retains the same shape and proportions in which it was originally built, but it would be impossible to specify all the alterations it has undergone after the lapse of so many centuries. It is recorded by Browne Willis in 1735 (and it is interesting to recall as far as one is able the appearance of a church in the days of our forefathers) to consist of a body, south aisle and chancel, which are tiled; at the west end is a tower coped and covered with lead, flat at top, in which hang three modern bells. Here was, as appears by the walling up of the arches between the pillars, a north aisle agreeable to the south aisle, which was taken down to repair the church, at which time the lead was taken off the south aisle, the upper windows stopped up, and the roof raised over them and tiled, to the great deformity of the church, which was regular before. But we may gather the appearance of an ancient church from further records. Imagine, for instance, the appearance of this church. It would be something like this, and there is very little imagination in the description. The appearance of the interior of a church before the Reformation may be tolerably guessed at by the description of its several parts handed down to us. A rood-loft, or narrow gallery, stretched across the body of the church at the entrance of the chancel, on which a rood or crucifix was placed, accompanied by a statue of the Virgin Mary and the beloved disciple St. John. The chancel was divided from the body of the church by gates. The altar, which was a stone slab marked with five crosses, one at each corner and one in the centre (and the ancient one of this church may be seen let into the floor beneath the communion table, revealing the position where it stood, and is inscribed to a former rector). This slab stood on four short pillars at the east end of the church; on it was placed a crucifix and similar figures as on the rood-loft lighted up with tapers. At a low desk in the middle aisle the litany-desk stood, where the prayers for the dead were said. The pulpit and font probably occupied their present places, and the remainder of the floor was covered with long open seats indiscriminately used by the parishioners. At this time the chancel, and probably the whole church, was paved with what are called Roman bricks or tiles. Some of these were found underneath the pavement when the church was last restored, and they may be seen inserted into the modern tile-flooring of the chancel. It is well that some of these are thus preserved, for had they been cast aside as worthless a most valuable relic of the ancient church flooring would be lost. Though these are called Roman bricks, they are in reality the ancient ecclesiastical tiling made specially for church purposes, as the designs will show. These designs embody Christian emblems and mottoes; if the church was connected with a monastic institution some engraving would show the abbot's head, and if the flooring was provided at the expense of a private individual the arms of the donor would be engraved on some of them. The dates of these tiles are of the thirteenth or fourteenth century. Those that are uncoloured and embossed are supposed to be of the early part of the twelfth century, or about the time of Stephen's reign. Some of these may be seen inserted in the pavement within the communion rails, and similar ones are to be found in St. Albans Abbey. These embossed tiles are very rare and the most ancient in existence. Those that are engraved and coloured are much more common, and examples of these are seen in the pavement of this chancel; other examples are to be met with in Tewkesbury Abbey and Gloucester Cathedral. And the modern Minton tiling is a copy and reproduction of this old tiling. In many instances several tiles or bricks formed but one pattern, the circles, &c., crossing from one brick to another. They are undoubtedly the remains of the original flooring of the church when first built. We know that many Roman stations were at no great distance from here—Stony Stratford and Towcester, for example. Several of the neighbouring churches seem to have been similarly paved. Examples of these tiles, in excellent preservation, may be seen in the churches of Maidsmoreton, Wappenham and at Lillingstone Lovell, which is now undergoing repair; the composition of these tiles may be examined, and the art of making them was no doubt at first taught by the Romans, and it is thought that at one time a pottery existed where Mr. Robarts's kitchen garden at Tile House now stands.

The changes which took place in churches after the Reformation were chiefly the substitution of a wooden communion table in place of the stone altar, which was placed in the body of the church; then the altar was again restored with all its appendages, and then was once more displaced by the present table, which was ordered to stand always at the east end in the place where the altar formerly stood. At this latter eventful period the King's arms also triumphed over the Cross, and the Ten Commandments occupied the station they now do in some churches at the east end. Could we see the churchwardens' bills of those days we could ascertain the number of copes, vestments and sacred utensils necessary for the celebration of the ancient worship, all of which were provided for by the parish. Since that period the laziness or pride of individuals gave rise to the reprehensible plan of converting the open seats into family pews, by which many monuments on the pavement of churches are covered; however, whenever a church is restored nowadays the open seating is reverted to, but too often the seats are allotted to the more opulent inhabitants, instead of being left to the indiscriminate use of the parishioners. These are the principal alterations which took place in the churches generally, but of the particular alterations which have taken place in this church, both in the building itself and its furniture, there is no record, though it must have undergone many in the preceding centuries. In 1804 and after several are noted as having taken place in a few years; for in 1804 the body of the church was repaired and ceiled, and the belfry enclosed, no doubt at the expense of the parish, whereas the communion rails were put up at the expense of the then rector, John Langham Dayrell. Five years after, in 1809, the chancel was ceiled by Richard Dayrell, the then patron. In 1811 a silver waiter, as an alms-dish, and a small silver gilt cup were given at Easter to this church by the same Richard Dayrell. In 1813 a gallery was erected at the west end at the joint expense of Richard Dayrell and the parish. We can tell from these details what the church was like before the last restoration. We have a similar instance in the sacred fane in the next parish, Lillingstone Lovell, before the restoration was began. Looking towards the east end, we see the window half blocked up with a plain unornamented board, on which are printed in plain black letters on a white ground the Ten Commandments, the Creed and the Lord's Prayer; beneath is an ancient oak communion table, round which is inscribed this inscription, "Samuel Walstall, in Artibus Magister, Ecclesiae dedit, Anno Domini 1633," translated, "Samuel Walstall, M.A., gave it to the church in A.D. 1633." On the north side of the table is a raised tomb, with a black marble slab on top, with cedar sides (the slab has since been lowered to the ground and the cedar wood taken away). On the opposite, the south side, there was nothing of importance to notice, the niche in which is the piscina and credence table being blocked up; the floor tiling were squares with plain embossed devices, much broken and dilapidated, enclosed with massive oak rails; the walls and ceilings whitewashed, and in many places green with damp. In the chancel are two pews opposite each other, the squire's and the rector's; the centre of the open space is taken up with a raised tomb with the figures of a man and woman on the top; at its foot is a small brass of a headless ecclesiastic inscribed to Richard Blakesley, and let into the stone pavement. On the north side of the chancel, close to the communion rails, is a plain stone slab, coffin-shaped, slightly raised under an arch, supposed to be the tomb of the founder, whoever he might have been. This is called an Easter sepulchre, and a similar one is to be

* A paper by the Rev. R. Dayrell, read during the visit of the Bucks Archæological Society.

seen in a church at Northwold, in Cambridgeshire. On the south side is a continuous sedilia under arches, broken at one end by a raised altar tomb, with a dark marble slab on the top, having a brass upon it of a man and a woman, inscribed to Paul Dayrell and Margaret his wife, and the chancel is divided from the body of the church by a low arch of very early Norman architecture, if not Saxon. The rest of the church consists of a body and south aisle, divided by pillars : whereas the pillars on the north side are walled up. It has a low ceiling, whitewashed, as also the walls, upon which no doubt are painted in plain black letters on a stone ground enclosed in lozenge-shaped rings, texts of Scripture, whilst on the north side are hung up some old hatchments ; and the body is adorned with oak pulpit and sounding-board above, reading-desk and clerk's desk, known familiarly by the name of a "three-decker": the parishioners' pews are of oak, square or oblong-shaped, and the floor is paved with large square Purbeck paving stones, very irregular and broken ; whilst at the west end is a gallery in which is a barrel-organ and a hatchment of the Royal arms, hanging on the wall facing down the church. The tower arch would be closed in and a door leading into the belfry, in which hang three bells.

Now, before this time it is stated, "The church is a plain building of stone, and appears to be very ancient, from the aisles being paved with Roman or Saxon bricks ; part of the church has also been paved with the same materials, some of which are entire ; but the ravages of time are, alas ! so conspicuous as to require a new pavement. The church porch is no doubt of great antiquity, supposed to be Anglo-Norman, if not Saxon." There was only one pane of painted glass, representing the Virgin Mary, in a window to the left of the pulpit, under which formerly there used to be a side altar. This, no doubt, was brought from Luffield Abbey when it was demolished, for the chapel was dedicated to the Virgin Mary. This pane of glass was taken by the workmen at the restoration.

The church was last restored in 1868, when a north aisle with vestry and organ-chamber were added. A new tiled roof to the whole church was made. The walls were cleaned and fresh plastered ; a glazed tiled floor laid down within the communion rails ; a tiled flooring in the chancel, and the rest of the church paved with the old stone paving ; a new communion rail on iron standards ; a new communion table of foreign oak, also a pulpit, reading-desk and lectern of oak, a font of stone, and pitch-pine benches were placed throughout the church. The restoration was undertaken by Mr. A. J. Robarts. The pews were formerly made of oak, and this wood was, after the restoration, used to panel round the Royal Latin School at Buckingham. The old communion table, which for about twelve years stood in the vestry, was presented to Foscott Church, near Buckingham, at its restoration in 1887.

Of other records of the church there is only need to mention the registers. In an old terrier, undated, but evidently of the year 1820, it is stated :—"We have three parish registers. No. 1 commences A.D. 1584 ; many parts of which are mutilated and imperfect. It, however, records the circumstance of the font being broken by soldiers, October 7, A.D. 1644," perhaps in the civil wars of Charles I. It was, however, repaired during the week, and a baptism took place the following Sunday, the broken font being used on the occasion. In 1826 the font is stated to be of wood, and probably was the one in existence until replaced by a stone one in 1868. From an old Exchequer document we gather that Paul Dayrell, the elder, received from the Commissioners of King Edward VI., on May 5, in the seventh year of his reign, A.D. 1553, "a chalice of silver with the paten, a surplice and linen clothes, to be kept safely for the use of the communion, and two great bells."

In a terrier dated 1785 is given this record of church furniture. "There belong to the church three bells, a font of stone, a coffer with three locks, a decent surplice, a book of Homilies, a Common Prayer-book, and a Bible of the last translation ; a pulpit cloth and cushion of crimson velvet, a linen cloth and napkin" (see below), "a silver cup and paten weighing about 14 oz. There are likewise a bier and hearse-cloth." In an earlier terrier dated 1745, the same articles of furniture are mentioned, but these words are added, "A linen cloth and a napkin for the communion table." In a terrier dated 1812, there are mentioned these additions to the communion plate, besides those before named :—"One smaller silver-gilt cup and silver waiter." There is an inscription on the silver waiter, notifying that it was the gift of Mr. Richard Dayrell, A.D. 1811 ; and as the silver-gilt cup is now mentioned for the first time, it is only reasonable to suppose that it was also the gift of Richard Dayrell.

A full description of the communion plate has been lately supplied to Mr. Myres, of Swanbourne ; so no more need be said on this point. Other points of interest are the bells. Two great bells are spoken of in the Exchequer account. Whether these are the first bells received in this church, or whether there were any earlier ones, it would be impossible to say ; and when these bells were recast or renewed there is no record ; certain it is that none of the bells at present in existence are of such ancient date, nor can it be stated when the third bell was added. We know that in 1735 there were in the tower "three modern bells." The date of the three bells now in the tower are respectively 1674, 1726 and 1868. This last bell was evidently recast at the time of the last restoration of the church. The inscriptions on the bells are of little importance ; they record who made them, and the date ; they are, however, thus stated :—

Large bell. "Richard C. Handter, MADE ME, 1674." D.N.
Centre bell. "Edward Hall made me, 1726."
Little bell. "CAST BY JOHN WARNER AND SONS, LONDON, 1868."

Of books, the only remarkable one is a book of Homilies, in black letter in Old English characters. A pulpit cloth, embroidered with the Dayrell arms in coloured silks and gold and silver thread (faded), with the motto "Doe well," and a scroll, in which are these words, "Donum Majister Thom. Dayrelli Armiger, 1659," and having a thick fringe at bottom of silver lace, tarnished by time, and it is said that, judging from the date of this ornament, it shows the wave of feeling that was then passing over the country, preparatory to the restoration of the Monarchy in 1660, for a few years previous to this date, such an ornament placed in a church would have cost any man his head, it being denoted as a symbol of Popery in the days of narrow bigotry in the time of the Commonwealth. This pulpit-cloth was hung in the chancel in 1873, below two helmets on the north wall, it not fitting the new pulpit which was placed in the church at the last restoration. The crimson velvet cushion which was placed on the pulpit, and was undoubtedly of the same date, was eventually destroyed, as it was a receptacle for moths, to the great destruction of the other furniture of the church. Before the Reformation these cushions were used as kneelers at the altar for the priest, as may be seen in some Roman Catholic chapels at the present day.

The only parts of the church which have not been spoken of are the hagioscope, or, as it is vulgarly called, "the squint-hole," in the wall on the north side of the church under the low arch leading into the chancel, close to the reading-desk, the use of which was for penitents to view the Mass or Sacrament of the Lord's Supper, and the "ambarium" (?), or small cupboard, in the side of the wall of the south aisle, alongside of where formerly a side altar stood dedicated to the Virgin Mary, used for keeping the reserved consecrated wafer for the communion of the sick.

The piscina (Lat., a fish, so translated from a Greek word for the same creature, the letters of which word were supposed to contain the different names and titles of our Lord) is, with the credence above it, built into a niche in the south wall of the chancel within the communion rails, was intended to rinse out the vessels after use at the sacrament, and the credence was a slab to place them upon until they were wanted for use.

The most noticeable architectural features of the church are undoubtedly the porch, most beautifully modelled and proportioned, having a stone slab roof to it, of which there are few examples in England. On a stone at the east angle of the south aisle, on the outside of the building, about 4 feet from the ground, are carved two sun-dials, called Saxon sun-dials, supposed to be builders' marks. Anciently our churches were built by Freemasons, and this mark may have something to do with their craft. On the same side of the church is a beautiful specimen of a Norman window of the early twelfth century. The two arches, east and west, inside the church are Anglo-Norman of different dates. The ecclesiastical ancient floor-tiling has been mentioned, specimens of which now remain. The Easter sepulchre is rare. The running or continuous sedilia is not often met with. The hagioscope is met with in several churches in this neighbourhood, and other features which may be met with in other churches are wanting here.

FRAMFIELD CHURCH, SUSSEX.

THE restoration of Framfield Church, including the erection of a new tower, is about to be undertaken under the direction of Mr. B. Edmund Ferrey, F.S.A. The Vicar has issued an earnest appeal to Churchmen and archæologists throughout the diocese, pointing out that the large and scattered parish of Framfield contains very few landowners (many of these residing elsewhere) who are able to give. Framfield Church was built about 1280 (where one of much earlier date had previously existed, portions of which remain in the present north wall) by Boniface, Archbishop of Canterbury, and dedicated to his murdered predecessor, Thomas à Becket. The tower fell, or was taken down, in 1667. The new tower is being built as nearly as possible on the site of the old one, and in character with the rest of the church. The main building is, however, much dilapidated, many of the seats and most of the flooring being rotten, and the timber of the roof, especially of the aisles, very much decayed. The interesting covering of

Horsham slabs, and the oak waggon-shaped and panelled ceiling of ancient date, will be retained. The work is urgent, and fully 2,000*l.* is estimated as required, besides that already given for the tower. About 1,200*l.* has still to be obtained, for it is proposed, besides executing these needful repairs to the whole of the exterior and interior of the church, to fix suitable hot-water apparatus for heating, to build a wall with lych gate at the entrance round the old and new churchyard, and to add all else that is needed to make the church suitable for its sacred purpose, without expenditure on objects of fittings and furnishing that may be left to the liberality of individual donors at a later date.

GLASGOW ARCHITECTURAL ASSOCIATION.

AT the monthly meeting, the president, Mr. William J. Anderson, in the chair, a paper on "Modern Congregational Churches" was read by Mr. Henry D. Walton, architect. After summarising the objections to the Anglican type as generally practised, having aisles that require columns, either of stone that obstruct or metal that appear hardly to support, he directed attention to a suggestive field in Eastern Mediæval examples. At Torcello and Milan, Thessalonica and Cairo, are models that require but little adaptation to meet admirably the necessities of a large auditory and yet conserve reasonable ecclesiastical and architectural traditions. Diagrams and prints of the old examples instanced, and of some modern London attempts to apply these to present-day requirements, were exhibited. The discussion was opened by Mr. M'Gibbon, and taken part in by several.

A CENTRAL STATION FOR BELFAST.

THE growing importance of the commercial capital of Ireland is daily emphasising the desirability of a central railway station. At present it is impossible to pass through the city by train. Passengers *en route* are obliged to change, and on reaching another station in a remote portion of the city are subjected to the inconvenience of "carrying," and probably, if their arrival has not been punctual, of the continuity of their journey being interrupted. Some time ago, when the property of the White Linen Hall, owned by the Countess of Shaftesbury, passed into the hands of the corporation, the site was spoken of as suitable, but was abandoned in favour of the new city hall. Recently a number of gentlemen, representing a company of London financiers, visited Belfast. They spent some time in considering a scheme which would be equally serviceable, and they have arrived at a conclusion which at first sight, at all events, appears practical enough. It is intended that a central station shall occupy a site in King Street, close to Smithfield. The Northern Company's connection is to be tunnelled by York Street and Royal Avenue, and the line from the present County Down terminus, continuing the low level, will reach the proposed centre by Waring Street and Berry Street. It is also proposed to tunnel the Great Northern from a point outside the existing station in Great Victoria Street. The scheme also provides for the building of a grand hotel on the central station premises. In the course of a few days a deputation of the promoters will visit Belfast with the object of waiting upon the directors of several railway companies and submitting proposals. Should the interview prove satisfactory the Bill will be promoted forthwith, and the capital, which is roughly estimated at three-quarters of a million sterling, provided. Sir Frederick Bramwell is mentioned as the consulting engineer.

DUNDEE AND ELECTRIC LIGHTING.

THE members of the deputation appointed by the Dundee Gas Commission to inquire as to the proposal to introduce the electric light into Dundee have submitted their report. The deputation examined the Deptford, Bradford, Chelsea and St. Pancras vestry systems, and state that, after carefully considering the whole matter, they think the commissioners, if they resolve to supply the light, should adopt the low-pressure continuous current system, with a station as near the centre of their compulsory area as possible. In regard to the financial aspect of the question, the deputation state that, looking to the many joint-stock companies which have undertaken the supply of electricity, which in the majority of cases have not been financially profitable, they cannot hold out, at least for some time, any prospect of the undertaking in Dundee being free from loss. Yet, in view of the great progress which has been made within the last few years, not only in reduced cost of production, but in many improvements for economical distribution, the deputation was hopeful that in a short time an installation in Dundee, if wisely gone about, might become at least self-supporting. The deputation added that it was generally admitted that 6*d.* per unit was equal to about 4*s.* 6*d.* per 1,000 feet of 18-candle gas. On this point, however, it was difficult to obtain reliable information, but that the cost to the consumer would be considerably over that of gas might be reasonably counted on.

Correspondence.

Escape from Fire.

SIR,—Under the Factory and Workshop Act, 1891, section 4, which comes in force on January 1, 1892, all factories in which more than forty persons are employed have to be furnished with a certificate from the sanitary authority of the district in which the factory is situated, that the factory is provided on the storeys above the ground floor with such means of escape in case of fire for the persons employed therein as can reasonably be required under the circumstances of each case. As far as I can ascertain the authorities have not made any regulations. As the subject is of great importance, I venture to call the attention of our profession to it, and suggest that an endeavour be made to obtain uniform regulations for the administration of the Act for the guidance of the authorities and the owners of such properties or their professional advisers. The Act makes the owner, and not the occupier, responsible for the provision of the alterations which may be required before the certificate is granted. In the application of this section to the administrative county of London the London County Council take the place of the sanitary authorities.—Yours faithfully,

HERBERT D. SEARLES-WOOD.

157 Wool Exchange, Coleman Street:
September 7, 1891.

GENERAL.

The Painting of Christopher Columbus, executed by the famous Moro in 1540, and purchased in London, for 2,000*l.*, by Mr. Charles F. Gunther, has arrived at the Custom House in Chicago, and will be displayed at the Fair.

Messrs. W. Sugden & Son, of Leek, are the architects of the new Roman Catholic church, which it is proposed to erect in the Avenue, Kidsgrove.

The State Government of Guernsey has commissioned Mr. Frank Whitmore, architect, of Chelmsford, to inspect some sites and design new school buildings for the island.

A New Theatre, erected at Southport at a cost of about 20,000*l.*, from the designs of Mr. Frank Matcham, has been opened.

Mr. Penrose has paid a visit to Great Chiswell Church, and has given his opinion that the tower can be made safe at a trifling cost.

Plans prepared by Mr. Alexander Cullen, architect, have been sanctioned by the Motherwell Dean of Guild Court for the building of a Free Church in Windmill Hill Street.

Herr Krickl, architect, of Vienna, who was taking a tour in the Austrian Alps, and is known to have ascended the Hoch König, near Bischofshofen, without a guide, had been missing since August 19. His body was found in a safe place, where he succumbed to exhaustion.

The Ruins of Sandown Castle, Deal, are rapidly disappearing owing to the action of the sea, and it is stated that unless prompt measures are taken, in a very short time all that will remain of the historic pile will be the site and the name.

The Public Park presented to Jedburgh by Mr. John Tinline, London, a native of the burgh, has just been opened.

A New Church has been erected at Leeds, the ventilation of which has been carried out by the "Climax" Ventilating Company, of 15 Great George Street, Westminster, S.W.

A Committee of the Town Council, Newcastle-on-Tyne, are taking steps for enlarging the city lunatic asylum and inviting competitive plans from local architects.

The Hornsey Local Board have acquired about eight acres of picturesque and well-wooded land for the extension of their pleasure-gardens at Hornsey. As the property was about to be laid out for building, the Board authorised its chairman (Mr. H. R. Williams) to negotiate with the owners with a view to its purchase, and it has been secured for the sum of 5,000*l.*, and is now being enclosed with iron railings previous to being laid out as a public recreation-ground. The newly-acquired property contains some fine trees, and extends from the existing pleasure-gardens at Hornsey to Crouch End, and is situated in the midst of a district which is being rapidly covered with houses. The acquisition of this property, although of somewhat limited area, will be a lasting benefit to the neighbourhood, and it is to be hoped that Mr. H. R. Williams will be equally successful in the efforts he is making to obtain the beautiful grounds of the Alexandra Palace as a public park for the use and enjoyment of the people.

The Architect.

THE WEEK.

THE hesitation to accept the proposals for the transformation of the Architectural Association is likely to be overcome, in some cases at least, by the appearance of the "particulars and details of its new curriculum." If, as Cardinal NEWMAN has said, the essence of every great school consists in the teachers rather than in patronage or prizes, the list given in the *brochure* ought to be enough to remove all doubts about the success of the enterprise. Mr. ELSEY SMITH should be competent to explain Orders, Professor KERR has had years of practice in teaching all about materials, Mr. H. ADAMS has instructed many students already in land surveying. Some of the other teachers have formerly made a name in Association classes, viz. Mr. FARROW, history of architecture, materials and construction; Mr. COLE ADAMS, elementary ornamental and colour decoration; Mr. E. PRIOLEAU WARREN, colour decoration; Mr. LACY RIDGE, professional practice; Mr. MAX CLARKE, sanitary science; Mr. SCHULTZ and Mr. J. A. SLATER, superintendence of studio; Mr. W. G. B. LEWIS, elementary water-colour class. Messrs. HANCOCK, HOLMES, MOODY and BURROWS, who will teach science, have good credentials; Mr. LEANING is the author of a book on quantity surveying, which is evidence of his competence to give instruction in the subject; and it is hardly necessary to recommend Mr. STIRLING LEE and Mr. POMEROY as masters in sculpture, or Mr. A. W. WEEDON in water-colours. It is said that "the aim of the Association courses is to help members to fit themselves for their work as architects, by providing the means by which they may supplement the training acquired in the offices where they are engaged as pupils or assistants; it is not its chief object to prepare candidates for the examinations of the Royal Institute of British Architects"—a statement which is entirely satisfactory. The fees are most moderate. The inclusive fee is 10*l.* 10*s.* for a year, while for separate courses the fees vary from 2*s.* 6*d.* to 3*l.* 3*s.* a year. The curriculum extends through four years. The scheme appears to be practicable throughout, and students for a small outlay will gain many benefits which were not obtainable under the former arrangements of the Association.

THE competition of the local architects for the Nurses' Home in connection with the Blackburn and East Lancashire Infirmary has been decided in favour of Messrs. SIMPSON & DUCKWORTH, of Blackburn, the assessor being Mr. ALFRED CULSHAW, of Castle Street, Liverpool. Every care had been taken to make the competition as fair as possible, and the names of those sending in designs were unknown to the assessor. In consequence of the letter of one of the competitors calling attention to the clause in the conditions that the architect of the premiated design would not necessarily be entrusted to carry out the work, the committee issued a circular stating that the assessor's decision would be adhered to, and the successful architect employed as originally intended, subject only to the condition that he could give satisfactory references of his ability and experience to carry out the work in a satisfactory manner. The result is gratifying to the successful competitors, inasmuch as one of the firm, Mr. A. W. R. SIMPSON, has had a connection with the institution as consulting architect for the past seventeen years.

THE venerable Sir JOHN STEELL, who died this week in Edinburgh, should not be judged solely by the statue of BURNS which is placed in the Embankment Gardens and is an adaptation of his bronze in Dundee. His seated figure of Sir WALTER SCOTT and the equestrian statue of WELLINGTON in Edinburgh are far finer works. He was vigorous enough, but it must be said that in many of his works there is an absence of the refinement which should characterise sculpture. In execution his most successful work is the memorial of the late PRINCE CONSORT in Edinburgh. It is, however, wrong in principle. The Prince is shown mounted, and if it stood alone few objections could be raised against such an equestrian statue. But it is supplemented by other figures exterior to the pedestal, who are supposed to be representatives of the people who were most grateful for the services rendered by the Prince. They are shown to be depositing memorial wreaths. Their action would not be unreasonable if the memorial consisted of a tomb or if the Prince were represented as dead; but it is otherwise with a figure that appears as living and commanding. It is possible Sir JOHN STEELL may have had in his mind's eye RAUCH'S great work in Berlin. In that case, however, FREDERICK THE GREAT is accompanied by the warriors and other great men who, with him, helped to raise Prussia. In the Leipsic memorial of the Franco-German War the pedestal is flanked by figures of the chief agents in the making of the Empire. In fact, there is no precedent of any importance for such treatment as was adopted by Sir JOHN STEELL.

FRANCE has lost another of her great painters by the death of THÉODULE RIBOT. In life and death there was much in common between DELAUNAY and RIBOT. Both were original, and in consequence were compelled to be patient while commissions were being lavished on inferior artists. Both were overcome through heart disease. RIBOT was such a master of light and shade he was worthy of being mentioned with REMBRANDT and VELASQUEZ. He had not the witchery of the Dutch master, nor the love of colour which inspired the Spaniard; but in making a painted figure appear solid through the contrast of light with darkness, RIBOT was never surpassed. At first sight his manner appears simple, yet we doubt if many have succeeded in making good copies of his pictures. The subjects he selected were adapted to his treatment, and in consequence his works are never disappointing. Some of his scripture scenes are in the Luxembourg, but he preferred to go to ordinary life for inspiration. He was homely in his ways, and his pictures have some of his character. He was born sixty-eight years ago, and was taught in GLAIZE'S *atelier*. He was not represented in the Salon until 1861, and although some competent judges recognised his power the purchasers held aloof. RIBOT never sacrificed to expediency, but bided his time. He made drawings and etchings, and kept his hand in practice with humble work. Mainly through the enthusiasm and influence of M. PAUL LEROI, the French people became aware that so unique an artist was still among them and able to endow them with works which were enough to uphold the credit of the French school. RIBOT'S latter years must have been satisfactory to him, for his skill was appreciated, his hand remained as strong as it was thirty years ago, and he no doubt anticipated some years of glory.

THERE is little chance for a revival of interest in heraldry unless the use of a coat-of-arms becomes a luxury that has to be paid for, and therefore it is well to have the law about licensing armorial bearings carried out. But a line should be drawn at bearings which are properly depicted. It could hardly be contemplated by the Legislature that any one wearing a ring with a crest, which may not belong to his or her family, is to be suddenly pulled up and interrogated upon the possession of the authorising document. This, however, has occurred in Lambeth. An Excise officer called on an auctioneer about his professional license. The gentleman wore a ring which attracted the attention of the exciseman, because there was a lion rampant on it. The auctioneer was asked whether he paid a license for using such armorial bearings, and he replied that he did not, as, having bought the ring with the crest upon it, he had no idea he was doing wrong or that he should have taken out a license through the Excise for wearing it. He was accordingly summoned to the police-court, and the magistrate held that the auctioneer was liable. If he wore armorial bearings or used them he was bound to take out a license. A fine of 1*l.* was inflicted and 5*s.* costs. Any one who makes use of a crest which has no association with his family deserves to be well fined by the Heralds' College for his presumption, and the case suggests that a revival of the Visitation of Arms has become a necessity. Still, the most zealous herald would not care to meddle with people to the extent that was exhibited in Lambeth.

BYZANTINE ART.*

THE second part of the laborious undertaking of M. KONDAKOFF will satisfy all the expectations which were raised by the first. The author, from his official position, possesses facilities for investigating all subjects that are associated with Byzantine art, and his pages are evidence that he has turned them to good account. His attention has been absorbed by the miniatures for the present, and they are related in many ways to various forms of art, but it is to be hoped that M. KONDAKOFF will afterwards treat of other manifestations of Byzantine skill, and in that way increase the obligations to him of all students of a most difficult subject.

In the second volume the period extending from the end of the ninth to the beginning of the thirteenth century is considered. Readers of GIBBON cannot forget the dramatic history of BASIL, the Macedonian, whose adventures seem like a tale that originated in Eastern imagination. Once settled on the throne of Constantinople, BASIL displayed the genius of a born ruler of men, and secured a temporary stability for the empire. His financial arrangements were of a novel kind. The historian relates how BASIL "assigned two patrimonial estates to supply the decent plenty of the imperial table; the contributions of the subject were reserved for his defence, and the residue was employed in the embellishment of the capital and provinces." It is no wonder that M. KONDAKOFF should date the most brilliant period of the Byzantine School from the Macedonian dynasty. The influence of the revived school soon spread through Europe and Asia. At the beginning of the tenth century there were no doubt apprehensions of the coming end of the world, but on that account people became more interested in religious art, and the productions of Byzantine miniaturists were sought by all who could pay for them. There were qualities in the style which made it serve at the time as a sort of universal language which pious people could understand. As M. KONDAKOFF says:—

> What caused the universality of Byzantine art was its tendency to abstraction. The perfection of the processes gained for it appreciation among people who were unlike in their origin and in their tastes. The miniatures and images executed in Constantinople served as models not only to the artists of the Empire but to those who dwelt in countries as distant as Georgia and Sicily. There are few parts of the East where Christianity is accepted in which the peculiarities of the art are not still to be traced. On the other hand, if it were not for the firmness of the principles of the art the artists could not have resisted the influence of the novel elements which were introduced from the East. Henceforth the court of Byzantium on one side and the convents of Constantinople on the other were the arbiters of taste, and gave character to art. The vast series of mosaics found in Palermo, Monreal, Cefalu, Naples, Salerno, St. Mark's, Venice, St. Just's, Trieste, in Greece from Daphne to Athens, in the Caucasus from Ghelati to Koutais, in Kief, were executed after cartoons which came from Constantinople or from designs prepared in that city. With some slight differences the technique and execution may be said to be everywhere similar.

According to M. KONDAKOFF, the miniatures or illuminations of the early part of the period which he treats denote that the artists were preoccupied with thoughts of colour, and saw everything they reproduced in rose or blue. The backgrounds recall the banks of the meadowy Bosphorus, the landscape being softened by the most delicate tones. Regard for nature is one of the characteristics of the Byzantine works in the eleventh century. But the smallness of the scale of the miniatures was a disadvantage, as it was an obstacle to vigorous treatment. The ornamentation passed through various stages. M. KONDAKOFF says that in the ninth century the initial letters were adorned with forms that were borrowed or conventionalised from nature, and the colour is suggestive of enamelling. Afterwards there was a nearer approach to reality. In the eleventh and twelfth centuries figures of animals were intermixed with plant forms in a fantastic manner, and thus suggest that Romanesque art was the continuation of the Byzantine. In course of time the figures of men and animals introduced became only a sort of abstractions or symbols, and then the artists were constantly under the temptation to repeat stereotyped forms. The history of Byzantine art from the twelfth century suggests that there was some ground afforded by the weakness of spirit to enable GIBBON to say, in his sneering manner:—"The bolder forms of sculpture, in brass or marble, which peopled the temples of antiquity were offensive to the fancy or conscience of the Christian Greeks, and a smooth surface of colours has ever been esteemed by them as a more decent and harmless mode of decoration." Even the works which gave rise to the tumults of the Iconoclasts do not appear to have been marked by vigorous treatment. There was always a strange tendency towards decline in Byzantium, and to anyone who has endeavoured to realise the character of the people, it is not surprising that the work of the illuminators became only, as M. KONDAKOFF says, mere rhetoric in painting, and a rhetoric, too, that was devoid of sentiment. The "Ménologe" of the Vatican may be taken as a sample of the degeneracy to which the art had fallen. The drawings are described by M. KONDAKOFF as a maladroit idealisation of simple figures: nature is replaced by artificial types; there is nothing dramatic; everywhere the human figure appears according to an uniform canon, and as the Byzantines did not care about differences of nationality, there is no trace of any distinction of race.

It is remarkable, however, that at a time when the miniaturists were fast losing all spirit and becoming mechanical, works in mosaic were produced which still command admiration. M. KONDAKOFF, among other buildings, describes the church of St. Sophia, at Kiev on the Dnieper, of which the decoration dates from 1051, as evidence of the system which was approved in those days. In the cupola is the image of CHRIST, surrounded by great figures of archangels, prophets and apostles. In the apse a colossal figure of the Blessed Virgin praying symbolises the terrestrial church. Below is a *Last Supper*, in which CHRIST is shown passing bread and wine to the apostles on either side; while lower still are figures of the fathers of the Church. Under the cupola are figures of CHRIST, the Blessed Virgin and the Baptist, a group known as the "Δέησις," or representation of the terrestrial church in Paradise. Elsewhere are medallions of the martyrs. To many the most remarkable part of the decoration of St. Sophia in Kiev will be found in the remains of the fresco paintings on the interior walls of the tower containing the staircase by means of which the princes of the city reached their seats in the choir. These frescoes, says M. KONDAKOFF, were treated with great spirit, religious and profane elements were intermixed in them, and the aim of the artists was evidently to speak to the eyes. Various spectacles are depicted, and particularly the games of the hippodrome and circus. In the hippodrome four chariots are about to start, the drivers having costumes of the four Byzantine colours. The attendants, police-officers and others are represented. In the circus, which is covered, are to be seen musicians, acrobats, clowns, mimics, who are all performing. M. KONDAKOFF says there was nothing repugnant to the religious spirit of the eleventh century in the introduction of scenes that were not ecclesiastical. In Palermo, the ceiling of the Palatine chapel is painted with similar subjects. The subjects were also employed in Mediæval illuminations.

M. KONDAKOFF gives ample descriptions of the principal manuscripts containing Byzantine illuminations which are to be found in Europe. The famous Psalter No. 139 in the Bibliothèque Nationale of Paris, which some authorities hold to be a copy of an ancient work, probably of the tenth century, is, according to M. KONDAKOFF, a very characteristic example of the purest Byzantine art of the ninth and tenth centuries. The drawing of *David (as Orpheus) playing the Harp* is properly described as being Pompeian in all its details, and the principal figure surpasses all those of ORPHEUS in the Catacombs. In *David overcoming a Lion and Bear* he says is introduced an antique figure of *Force* that was derived from the statue of *Diana the Huntress*. The *Exaltation of David* is essentially Byzantine, for the king is clothed as one of the emperors. The figures of *Wisdom* and *Prophecy* were evidently imitated from some classic works. The Psalter is one of the treasures of the Paris Library, and M. KONDAKOFF considers that in execution it is superior to the no less famous Psalter of the Vatican.

* *Histoire de l'Art Byzantin, considéré principalement dans les Miniatures.* Par N. Kondakoff, Directeur au Musée Impérial de l'Ermitage. Edition Française Originale. Publiée par l'Auteur, sur la traduction de M. Trawinski. Tome Second. Paris: Librairie de l'Art.

M. KONDAKOFF possesses the knowledge by means of which many things in the miniatures which puzzled earlier investigators become clear and impart a new interest to the work. It may be truly said that never before was Byzantine art so well described and interpreted. There is a spirit of reverence in M. KONDAKOFF's remarks which is well suited to the subjects, that are mostly Biblical. The descriptions open out a new field for archæologists, as they reveal the fidelity with which mosaicists followed illuminators. As in Greek sculpture there were types which had to be kept in view, it may also be said that the Byzantines created models for Romanesque and Mediæval artists. This peculiar conservatism is explained in M. KONDAKOFF's valuable volumes.

OLD BARGEBOARDS.

BY A CORRESPONDENT.

THERE is scarcely any one detail in the work of the Middle Ages which cannot be treated quite as a monograph; that is, in such a manner that the more it is written about the more it is found what a mine of unexplored wealth is still left uninvestigated. One man may appear to have thoroughly exhausted its resources, when lo! another takes up the subject independently, very possibly without having heard of or seen what the other has done, and the results are found to be extremely different, with scarcely any repetition, such as might have been expected. For, instead, there is a great deal of fresh information; new light is thrown upon dark corners, and the student impelled towards lines of thought previously undreamt of. The writer might instance such subjects as the ground-plan of the English parish church, the types of tower in different counties, the Eastern sepulchre, window tracery, low side windows, and so on. Put two or three men who have been real students, not only of books but of buildings, to write upon any one of these points, without having any communication with each other, and note what a variety of information will be collected, particularly if these inquirers have been long engrossed in their darling pursuit of ecclesiology or archæology. With this brief introduction, let us now consider the theme of "Old Bargeboards." What a picture this conjures to the mind of many a charming, ancient house, perhaps much ivy-mantled, with all those truly English accessories of a real house that differentiate it so much from the majority of Continental examples. In Mediæval bargeboards there is, of course, much variety in the general treatment, and it is interesting to analyse and dissect these exquisite specimens of our forefathers' inventive taste. But before proceeding further with the general subject it will be well to touch upon the derivation of the term "bargeboard," or as it is more correctly termed, "vergeboard." The barge-course is that part of the tiling which projects beyond the face of a gable wall; hence the origin of the word. There can be no question whatever as to the superior beauty of that type of building which carries a bargeboard as compared with stone-coped gables. Look at the half-timbered or weather-tiled and roofed houses and cottages of Kent, Sussex, Surrey and Hants, and then those of Cornwall, Wales, Derbyshire, Yorkshire and Lancashire, with their slated roofs, the walls also frequently smoke-begrimed owing to the busy manufacturing districts where they have been planted down. No doubt there is more dignity and grandeur in the latter than in the former; but for that charm peculiar almost to "Old England," the southern type bears the palm. It is a pity that the speculating builder, with his "architectural" draughtsman, have tried their best unconsciously to vulgarise the Mediæval bargeboard, attempting first to copy (and doing that most indifferently) and then proceeding further to improve, as they vainly imagine, on the original. For example, old bargeboards do not usually have that great projection found in many modern ones, unsuitable to our climate as much as the considerably overhanging eaves of the south of Europe would be here. The writer is not so much alluding to the present style of bargeboard, with which he is not altogether in accord, but to that of an earlier period of the nineteenth century. Sometimes these are lath-and-plastered on the soffits behind the bargeboard, which makes them look still heavier and more ugly. There is another objectionable feature, as a rule, in the type of modern bargeboard just touched upon, *i.e.* the exaggerated "gable-knob" (or hip-knob, as more generally but very incorrectly called in connection with a bargeboard). This is occasionally found in ancient examples, but its use is exceptional and its treatment requires great skill so as to avoid a vulgarised effect. At the Grey Friars' Hospital, Coventry, is an elaborate octagonal and panelled gable-knob carried well up above the ridge of the roof so as to form a feature. It is of the early sixteenth-century period, and at Ludlow is another example of late sixteenth or early seventeenth-century date. The majority of bargeboards carried out, say, within the last ten years are simply mitred at the apex, and in most cases moulded, not perforated, panelled or carved. Often, in the writer's opinion, they are of insufficient projection both for utility and effect. The original *raison d'être* of our bargeboard was to protect the upper part of the gable from wet. No architectural student would pretend to say that it would effectually carry out that purpose; but there can be no manner of doubt that a bargeboard which is designed on the *via media* principle of projection must be useful. In some recent instances the bargeboard has been superseded by a moulded rafter, the back edge of which touches the wall. This does away with the primary function that the subject of this article has to perform, for there is no shadow—a great loss where it is reasonably expected, as in the case of a bargeboard. Instead, the probability is that wet, rather than being thrown off, is attracted. Why do some architects vainly endeavour to improve on their forefathers' common sense? The gable-knob, properly so-called, with only a pendant below the bargeboard, is a better finish than a plain mitre, and may be considered as a suggestion of the ridge-piece a little way behind it. In traceried bargeboards the knob is not so much missed, as the design of the perforations or panelled work may be so arranged that the mitre at the top gets overlooked. In a plain moulded bargeboard it is necessarily much more conspicuous.

The "Dictionary of Architecture" comments upon pendants to the eaves of bargeboards as a "modern absurdity." The present writer can see no beauty or suggestiveness in them, but is fain to confess that there is, however, ancient precedent for this feature, as at Chiddingstone, Kent, in some old houses there and also elsewhere. It by no means follows that "we should follow the multitude to do evil," *i.e.* that because something boasts of antiquity, therefore it is good. Where all the architectural surroundings are very rich this little excrescence, or piece of prettiness, may not come in amiss. But to put it in an ordinary speculating builder's "villa residence" is a different matter, where it only becomes pretentious.

Primarily bargeboards may be divided broadly into two classes—those which are straight on the underside, and those which are curved or shaped. There are of course subdivisions, which will be noticed further on. The writer is of opinion that the first-named is the superior, and in this year of grace, 1891, the majority of bargeboards in those buildings where an architect properly so-called has been engaged, this appears the favourite type. There is something substantial in the long straight line on the lower edge. In principle it is really the same as the enclosed arched line to the cusping of a decorative wall arcade or in the tracery of a window. In the latter the insertion of "eyes" helps to enrich and to give a completeness to the outline of the extrados which it otherwise would not have, as an imaginary line can be then drawn. Moreover, the main constructional arch and the decorative cusp are thus in separate "orders" instead of only the cusps having the mouldings. These small points of detail are not trifles; they all deserve minute study. It is one of the great charms and delights of Mediæval work that there is so much variety in its every feature. But to revert to bargeboards. There is an intermediate kind in the two broad divisions first named, where the greater part of the face consists of panelled tracery, only a small portion next the underside being perforated. Respecting that class of bargeboard which is terminated by a straight line on the underside there is the traceried work panelled throughout; the same, but intermixed with carving, or another variety having the flowing carved foliage on the upper-side of the bargeboard and under it arranged in frieze-like fashion, a series of quatrefoils or other geometric figures, as at an example to be seen at the interesting

Ford's Hospital, Coventry. Coming to the later specimens, they lack the vigour of the earlier, some being too flatly treated in a kind of linen-pattern style; not that it is really so, but only mildly suggestive of it. The notion such bargeboards give is that the mouldings were designed on the flush principle, like reedings or the flutings to a Classic pilaster. This, of course, has a poor, tame effect. A moulded bargeboard, however simple in character, looks well if its mouldings are in two or three "orders," so to speak, giving nice crisp shadows when the sun shines, and provided with a tile-verge well projecting, only the bed of the tiles being pointed in, or, as the writer has sometimes done, with a wood-fillet notched on the upper side to receive the tiles. Either of these treatments is better than the too common practice of covering the entire edge of the tile-verge with a coating of Portland cement. Another kind of bargeboard of the later periods is that entirely carved with foliage, flowers, animals and grotesques, which has a rich appearance. The bargeboards of the Elizabethan and Jacobean times, with their frets, guilloches and combination of geometrical forms with grotesques, &c., as at houses at Mayfield, Sussex, are not quite so usual as the varieties previously mentioned. Such ornamentation does not seem to lend itself kindly to the bargeboard. The only other species that remains to be commented upon is that which, at the present day, has gained much favour because it is effective, and also moderate in cost. This is the judiciously-moulded bargeboard with some delicate pateras, or some running half-hidden carved foliage. Or, sometimes, it has the mouldings with a very slightly serrated outline to the under edge. The amplification of the bargeboard occasionally essayed by speculating builders' draughtsmen, or ambitious architectural novices, consists of what looks like a suggestion of a truss, with collar beam, arched braces, &c., projecting considerably from the gable wall, the purlins being brought out and made prominent features with brackets under, back to the wall. All this is fussy in effect and constructionally useless. What object can there be in covering up a considerable part of a gable wall with something out of character? The half-timbered construction flush with the wall is designed on quite different principles, and rests on substantial solid supports.

The gable-knob in some of the later examples of bargeboards is made a prominent and rich feature, being sometimes semi-octagonal in plan and of sufficient diameter to be richly panelled with tracery on each of its sides. The knob pendants look very well if only turned, but if square, octagonal, or hexagonal, are still more effective. If designed on a cruciform plan, having miniature "trusses" projecting towards each of the cardinal points, or in some kind of fleur-de-lys open in the centre, the appearance is good.

Except in timber porches the bargeboard is rarely found in connection with ecclesiastical work, though there seems no reason why it should not be so in the case of simple village churches, where the freestone for gable copings would have to be carried a long distance at some expense.

In conclusion, it is an advantage on the part of the bargeboard over its relative, the gable coping, that its design is susceptible of certainly more variety without much extra cost. For simple buildings the flat stone coping, with apex-stone and possibly ornamental springing-stone, with summer-stone under and the saddle-back moulded coping, are the only varieties, though at Congresbury Church, Somerset, the writer calls to mind an exquisite little lurking patera in the hollow of one of the late Decorated gables. In later work there is the shaped Elizabethan coping, and in brickwork the crow-stepped gable. In modern buildings the late Sir Gilbert Scott has shown how very rich and varied gables may be at the St. Pancras Hotel—overdone there one may reasonably say. In the "Modern Renaissance Freely Treated," the only name the writer can apply to the now fashionable style, the gables have a great deal of work thrown into them. However, the bargeboard can be used where it is most suitable, and the stone or brick coping in those situations where desirable. The writer has only wished to jot down a few notes on an interesting subject, and not to lay down any law.

Karl Eckermann, the German landscapist, has died at Göttingen, in his fifty-sixth year. He was the son of the author of "Conversations with Goethe."

THE BIRMINGHAM ART GALLERY.

A COLLECTION of pictures now in course of arrangement at the Corporation Art Gallery, which will be opened to the public during the last days of the present month, is, according to the *Birmingham Post*, of a very remarkable character, as it will include many of the most celebrated works of members of the pre-Raphaelite school. Many of the examples have never been seen before in Birmingham, and some of them have been lent to the Art Gallery Committee under quite exceptional circumstances. Among them are the *Strayed Sheep*, by Mr. Holman Hunt, which Mr. Ruskin holds to be one of the greatest works in existence. To this will be added the same artist's *Scapegoat*, *Isabella and the Basil Pot*, and *The Shadow of the Cross*. Of works by Sir J. E. Millais the keeper of the gallery has secured no fewer than seven, including the celebrated *Vale of Rest*, which Mr. Henry Tate has generously presented to the nation with a large number of other works, and the famous pictures *Mariana in the Moated Grange*, *The Proscribed Royalist*, the very early pre-Raphaelite work, *The Blind Girl*, a study for the *Huguenots*, *The Baptism of Guthrum*, and *Greenwich Pensioners at the Tomb of Nelson*.

The committee having recently acquired, for the permanent collections, pictures by several great artists, it was thought that further examples of the style and methods of work of these painters would be of great interest to all visitors to the gallery, so that the exhibition will consist almost entirely of the works of the two artists mentioned above, together with examples of D. G. Rossetti, Mr. Burne-Jones, Mr. G. F. Watts, Mr. Ford Madox Brown, the late J. F. Lewis, the late William Hunt, Mr. Henry Wallis and Mr. Arthur Hughes. In this way an opportunity will be given to all art lovers of examining an unusually large series of examples of the earliest and best work of the leaders of the pre-Raphaelite movement; and such an opportunity must necessarily be a rare one, as most of these pictures are in private collections.

Among the works by Rossetti may be mentioned *Beata Beatrix*, *The Damozel of the Holy Grail*, *Sir Tristram and La Belle Iseult*, and *Sir Galahad*. Among the works by Mr. Burne-Jones are *The Adoration of the Magi*, *The Flamma Vestalis*, *The Wheel of Fortune*, and others. The late J. F. Lewis is represented by *The Doubtful Coin* and *Cairo*, the latter specially lent by Lord Northbrook. Mr. G. F. Watts is represented by *Death Crowning Innocence* and *A Roman Lady*; Mr. Henry Wallis by his famous *Chatterton*; and Mr. Arthur Hughes by *April Love*, *St. Agnes's Eve*, and *The Music Lesson*. About twenty works by Mr. Ford Madox Brown have been obtained, chiefly from the collection of Mr. Henry Boddington, of Manchester. Among them are *Cordelia's Portion* (Mr. Albert Wood), *Romeo and Juliet* (Mr. James Leathart), *Sardanapalus*, *Romans Leaving England*, *Haidee and Don Juan*, *Stages of Cruelty*, *The Entombment*, *Cromwell and Milton*, *Weights and Measures*, *The Christening of Edwin*, and others belonging to Mr. Boddington; and *The Last of England*, the property of the Corporation. Among the principal picture owners who have kindly placed their possessions at the service of the committee, not including those mentioned above, are Lord Armstrong, Sir Horace Davey, M.P., Sir John Pender, and Messrs. George Rae, W. Cuthbert Quilter, M.P., G. F. Watts, R.A., W. Coulthart, G. Lillie Craik, William Agnew, James Hall, Humphrey Roberts, H. F. Makins, J. G. Henshaw, Fred Crisp, R. H. Benson, George James, Arthur Severn, Charles G. Clement and Messrs. Thomas Agnew & Sons.

A VENETIAN HAILSTORM.

THE following is an account, which appeared in the *Gazette of Venice*, of a recent hailstorm:—It caused fearful havoc to property. About three o'clock in the afternoon the sky became obscured, and the darkness was so intense as to indicate that a storm of some violence was approaching. The wind raged and the rain fell, followed by hailstones as large as nuts, and sometimes as large as eggs. On the roofs of the houses the contact of the hail gave one the idea of an invisible army of blacksmiths at work on their anvils. Window-panes were broken and tiles blown about and shivered in thousands of pieces. The rattling of the hail on the Piazza of St. Mark was like the rumbling of an iron-plate rolling-mill. The small steamers which ply on the Grand Canal ceased to run, and the glass coverings of their engine-rooms were smashed, although protected with gratings of brass rods. The trees on the Riva of the Schiavoni were uprooted, and the windows of the municipal offices sustained great damage, as well as the windows of many other palaces. The most serious effects of the storm were to be seen at the residence of the English painter, Sig. Henry Woods, who resides in Colle del Dose, San Maurizio. This gentleman has erected from the side of the house into his garden a fine studio, covered in with large panes of plate-glass, and this was thickly covered with vines. Out of seventy-five panes of glass only two remained,

many of the panes representing the curious appearance of spiders' webs, the hailstones having "cut clean through" them. Fortunately, Mr. Woods, who anticipated a severe storm, and having had some little previous experience, removed several valuable paintings from his studio, and so they escaped any damage, but his studio was left a wreck, glass and vines had disappeared. There remained nothing but the wooden framework. The storm will certainly prove a harvest for the glaziers. In the windows of the municipal offices about two hundred and fifty panes of glass were broken, and such was the force of the hailstones that they chipped off pieces of the columns in the piazza and off the steps along the Lido. At the Rima Baths the confusion was indescribable; one of the attendants swooned through fright. The glass-covered entrance of one of the theatres was smashed to pieces. The storm seems to have travelled across Lombardy, commencing at Turin, then Milan and onwards, terminating, but with redoubled energy and with worst effects, at Venice. In the island of the Giudecca the vines were totally destroyed. Telephonic communications were completely interrupted, about one hundred and fifty wires were cut as if by strong nippers, and the damage done amounts to some thousands of pounds.

ART IN THE CHICAGO EXHIBITION.

THE following are the rules and regulations relating to sending works to the Department of Fine Arts of the Chicago Exposition of 1893:—

The Department of Fine Arts of the World's Columbian Exposition will open in Chicago, May 1, 1893, and will close October 30, 1893.

It will be open to such works of American (United States) and foreign artists, whether previously exhibited or not, as may be classed under the head of Fine Arts, under the following schedule:—

Sculpture.—Figures and groups in marble; casts from original works by modern artists; models and monumental decorations; bas-reliefs in marble or bronze; figures and groups in bronze; bronzes from *cire-perdue*.

Paintings in oil; paintings in water-colour; paintings on ivory, on enamel, on metal, on porcelain or other wares; fresco painting on walls; engravings and etchings; prints; chalk, charcoal, pastel and other drawings; antique and modern carvings; engravings in medallions or in gems; cameos; intaglios; exhibits of private collections.

The following will not be admitted:—1. Copies, even though they be reproduced in a class different from that of the original. For example, engravings obtained by industrial processes. 2. Pictures, drawings or engravings not framed. 3. Works of sculpture in unbaked clay.

The Department of Fine Arts shall consist of:—1. An American (United States) section. 2. A section for each foreign country which is represented by a general commission or by a national committee. 3. A section comprising exhibits of private collections and the works of artists of non-represented foreign countries, whose works may be admitted under the provisions of another section.

American (United States) artists must deposit—or cause to be deposited—with the chief of the Department of Fine Arts, before November 1, 1892, a list, signed by them, of such works as they desire to exhibit. A separate list should be made for each group and class, strictly following the schedule. Artists will be duly notified when their works must be sent in for examination by a jury to be appointed in future.

Works of American (United States) artists, produced since 1876, which have passed the examination of juries of exhibitions of acknowledged standing, will be admitted on list, should the jury so determine. An examination of lists will be made at an early day after November 1, 1892. Artists whose works may be admitted under these conditions will be at once informed by the chief of the Department of Fine Arts. Works accepted must be delivered at the receiving gate of the building for the Fine Arts on or before March 1, 1893.

The Department of Fine Arts or its representatives will be responsible for simple interior decoration of the galleries of the art building. Special decoration or arrangements in lighting, &c., differing from those provided, will be executed at the expense of the national committee of the country asking for it, and under the joint direction of the foreign representative and the architect of the art building.

The chief of the Department of Fine Arts will not correspond with the artists of countries represented by general commissions or national committees. The works of these artists will be admitted only through general commissions or national committees having in charge their reception and return.

Foreign artists—natives of countries not represented by a general commission or national committee—should address their request to the chief of the Department of Fine Arts before July 15, 1892. They should notify him of the number of works they wish to exhibit, the subjects and dimensions, including frames. They will then be informed where to send their works for examination by a special jury, who will pass upon the admittance of all such works. In the case of works that have already passed the juries of exhibitions of acknowledged standing and have been exhibited, action will be taken by the jury at an early day after July 15, 1892. A notice of the action of the jury will be sent to the artist at once. Works accepted must be delivered at the receiving gate of the building for the Fine Arts on or before March 1, 1893.

General.—Packing and transportation of all works will be at the expense of the exhibitors, unless special arrangements are made through private enterprise or public effort. A special rule for the guidance of those sending works, giving information in regard to packing, marking and shipping, will be furnished on application.

When a sufficient number of works (pictures) are contributed by one artist to warrant such arrangement, an effort will be made to hang them in one group.

A card of admission will be issued to each exhibiting artist, entitling the holder to the use of the grounds when open to the public. This card must be signed by the holder, and must be shown to the attendant when asked for.

The custodian of the art building will have the care and protection of works of art. Guardians of the gallery will be subject to his direction. He will use all due vigilance to insure the safety and protection of works of art against theft or damage. Information as to special insurance, &c., will be given on application.

Works of art will not be sketched, photographed or reproduced, except with the written permission of the exhibitor, countersigned by the chief of the Department of Fine Arts.

The number and character of the honours conferred will be announced later; also the appointment of the Jury of Awards.

Works of art must remain in the exposition until its close, unless removed by a special permit, signed by both the chief of the Department of Fine Arts and the director-general.

All works exhibited must be removed within a reasonable time after the close of the exhibition. They will be delivered only on the presentation of the original receipt.

The building for the Fine Arts is a bonded warehouse, and all works of art will be received within its walls subject to the inspection of the customs officials, but without the payment of duty. They will be received and sent out in bond. In cases where pictures or other works of art are sold, to remain in the United States in the possession of private individuals, duty will be paid in accordance with the customs laws governing such cases.

It is understood that artists, either native or foreign, becoming exhibitors, thereby accept the conditions stated above, and agree to comply in every respect with the above requirements.

TWISTED IRON IN FLOOR CONSTRUCTION.

AT the first meeting of the session of the American Society of Civil Engineers on the 2nd inst., a paper by Mr. E. L. Ransome on "Concrete Beams Reinforced by Twisted Iron for Floor Construction" was read. The system referred to consisted in embedding twisted bars of iron in the concrete beams, by which it was claimed a very strong floor can be made at small cost. The California Academy of Sciences, San Francisco, has five floors of the museum portion, or about 50,000 square feet, so constructed, and estimated to carry with safety 250 lbs. per square foot. The museum building of the Stanford University at Palo Alto, Cal., is being constructed as a monolithic structure, the foundation, walls, two floors and roof being of concrete and twisted iron. The building is 300 feet by 50 feet, with spans of 45 feet and less. The depth of beams ranges from 7 inches to 45 inches, with floors 3 inches thick. The concrete is of hard trap rock and Portland cement, in the proportions of 1 to 14 for walls and 1 to 6 for floors.

The paper gave rise to considerable discussion, evincing a sceptical feeling as to the advantages claimed. Mr. Seaman thought the twisting would be an injury rather than a gain, and that in case of fire the iron would stretch, and, owing to the difference of expansion of the concrete and iron, the effect of the latter would be lost. A visitor described a system of concrete floor construction in which a network of wires 1½ inches apart was hung from the top of the beams, and a flat floor of concrete made, extending a little above the beams and below the bottom of the curve of the wires, the thickness being about 4 inches for a span of 6 feet 3 inches. The wires are No. 12 gauge, and those from beam to beam are double. A thin, flat concrete ceiling protects the lower part of the beams, and the beams are also coated with the concrete mixture. This construction can be built by unskilled labour. Mr. Fouqué thought the use of sawdust in concrete or plaster for fireproofing material to be a mistake, experience on the West Shore R. R. having shown that it is completely destroyed by fire. Gauge mortar on wire lath gives very satisfactory results, but is expensive.

TESSERÆ.

Costliness in Architecture.

IN every production of human labour the influence of variety is limited by two circumstances, viz. by the costliness and the permanence of the materials upon which that labour is employed. Wherever the materials of any object, whether of use or of luxury, are costly, wherever the original price of such subjects is great, the influence of the love of variety is diminished, the objects have a great intrinsic value independent of their particular form or fashion, and as the destruction of the form is in most cases the destruction of the subject itself, the same form is adhered to with little variation. In dress, for instance, in which the variation of fashion is more observable than in most other subjects, it is those parts of dress which are least costly of which the forms are most frequently changed; in proportion as the original value increases the disposition to variety diminishes, and in some objects which are extremely costly, as in the case of jewels, there is no change of fashion whatever, except in circumstances different from the value of the objects themselves, as in their setting or disposition. Of all the fine arts, however, architecture is by far the most costly. The wealth of individuals is frequently dissipated by it, and even the revenue of nations is equal only to very slow and very infrequent productions of this kind. The value, therefore, of such objects is in a great measure independent of their forms, the invention of men is little excited to give an additional value to subjects which in themselves are so valuable, and the art itself, after it has arrived at a certain necessary degree of perfection, remains in a great measure stationary, both from the infrequency of cases in which invention can be employed and from the little demand there is for the exercise of that invention. The nature of the Grecian orders very plainly indicates that they were originally executed in wood, and that they were settled before the Greeks had begun to make use of stone in their buildings. From the period that stone was employed, and that, of course, public buildings became more costly, little further progress seems to have been made in the art. The costliness of the subject, in this as in every other case, gave a kind of permanent value to the form by which it was distinguished.

Cob Walls.

The cob walls of the West of England are composed of earth and straw mixed up with water, like mortar, and well beaten and trodden together; the earth nearest at hand is generally used, and the more loamy the more suitable. These mud walls are made two feet thick, and are raised upon a foundation of stonework. The higher the stonework is carried the better, as it secures the cob-work from the moisture of the ground. After a mud wall is raised to a certain height, it is allowed some weeks to settle; this period varies according to the damp or dryness of the atmosphere. The first layer or rise (Devonicé raise) is from three to five feet high, the next is not so high, while every succeeding raise is diminished in height as the work advances. The solidity of cob walls depends much on their not being hurried in the process of making, for if hurried they will surely be crippled and swerve from the perpendicular. It is usual to pare down the sides of each successive raise before another is added on it. The cob-parer (the instrument then used) is like a baker's peel—the shovel for removing the bread from the oven. The lintels for the doors, windows, cupboards, or other recesses, are put in as the work advances, bedding them on cross pieces. The walls are carried up solid, and the respective openings are cut out after the work has well settled. In forming these walls one man stands on the wall to receive the cob, which is pitched up to him by another below, the man on the work arranging and treading it down. Each workman generally uses a common pitchfork. The whole is then covered with thatch. Devonshire thatching is very superior to that in most parts of England. It is done with combed wheatstraw (Devonicé reed), which consists of the stiff, unbruised, unbroken stalks, which have been carefully separated by the thresher from the fodder straw and bound up in large sheaves called nitches. The outer walls are plastered the following spring, and this plaster covered with a whitewash of lime or rough-cast (Devonicé slap-dash). These are dangerous processes in the hands of a builder without a cultivated taste, for such a wall, to use the metaphorical language of Loudon, "has no beauty because it has no expression." The whitewashing this inexpressive cob pleases the eyes of ordinary tourists by the contrast it produces with the surrounding scenery, but it is condemned by the tasteful Gilpin as the most inharmonious of tints and productive of a disagreeable glare. That glare, however, is soon mellowed by the hand of time, and toned down by dirt and damp. The building then appears in most artistical and picturesque keeping. Rough-cast and slap-dash are terms which accurately describe the action and effect. The wall is plastered very smoothly with lime and hair mortar; as fast as this coat is finished a second workman follows with a pail of rough-cast, which he throws on the soft plaster. The materials for rough-cast are composed of fine gravel reduced to a uniform size by sifting or screening, and by washing the earth carefully out. This gravel is then mixed with pure, newly-slaked lime and water, till the whole becomes of the consistence of a semifluid; it is then forcibly thrown, splashed, slap-dashed upon the wall with a large trowel. The workman then brushes over the mortar and rough-cast with the lime liquid in the pail, so as to make all, when finished and dry, appear of the same colour. The building is then complete; this plaster and rough-cast gives the last finishing touch of beauty, the *coup de grâce*, to cob. It is like the sprinkling with comfits the sugary chalk plaster of the indigestible twelfth-cake, that confectionery cob. The real worth of cob, however, consists not in these outward charms, but in the intrinsic merits of the facility and cheapness with which it is made. It will cost, speaking roughly, about three times less than stone and five times less than brickwork; it requires, however, considerable time in the construction. A cob house of two storeys ought not to be built in less than two years, in order that the work may settle completely. Cob is extremely durable when protected from wet above and below, for, as Hamlet's grave-digger has it, "your water is a sore decayer." This is implied in the Devonshire adage, that "all cob wants is a good hat and a good pair of shoes." Instances occur of cob houses built in the time of Elizabeth being found at this day in perfect preservation.

Rusticated Masonry.

There are three principal kinds of rustication, called technically "frosted," "vermiculated," and "chamfered." The two former and least important consist merely in leaving or making rough the visible surfaces of the stones, except at the margins, where they are chiselled smooth; by the last method the stones, whether rough or smooth, are bevelled, or "chamfered," at their edges. All these devices have one main end, which is to exhibit the structure of the walls by marking the junctions of the stones, and to this end the third mode adds a capacity to express, by the depth or shallowness of the bevelling, different degrees of thickness in the wall, since the beholder naturally and instantly concludes that its thickness is always great enough to render insignificant the loss of power which is produced by cutting away the edges of its stones. Now there is no end to the variety of interest, though it may not be very high, and of expression, though not perhaps of the most subtle kind, which the Renaissance architects produced by this last species of rustic-work in wall surfaces, more especially in those of the basement storeys, of which the masonry is obviously required to be strongest and where, therefore, the chamfered mode is most appropriate. Most Renaissance basements are elaborately and successfully studied for this special object. The nature of a basement excluded, for the most part, the barbarous traditional decorations which were apt to disfigure the *bel étage*, thus freer scope was left in it for dwelling on intelligent arrangement and for displaying the living powers of gravitation and resistance in the stones. In the basement of the palace of Charles V. in the Alhambra, built by "the Spanish Michel Angelo," Alonzo Berruguette, every stone has its distinct office and is unlike the one next to it, yet the whole is simple in effect and capable of being comprehended at a glance. The basement of the Strozzi Palace, Florence, is divided by apertures into eight equal surfaces of wall, numbering in no case more than seven blocks, yet each differing from all the others in arrangement. It would require a volume to go through the constructive problems visibly solved in the exhibited masonry of the Renaissance. The practice of rustication would, we think, have been sufficiently justified had it stopped at the production of this excellent and essentially architectural effect, but the exhibition of masonry answered another and even more important end—one which was considered by the Greek architects of the best time as worth obtaining at a very large expense of labour. They polished the edges of the frustra of shafts so carefully that the junctions became literally invisible, but they were just as careful to mark the horizontal layers of the wall masonry. The Greek architect did this in order to render the wall a foil to the all-important columns by depriving it of all chance of being supposed to share in their activity. Now Renaissance rustication performs the same office of contrasting the naturally active expression of the shafts by the naturally passive expression of the wall, but the wall lines are commonly much broader and deeper than in the Greek, and are also perpendicular as well as horizontal, because the wall itself has an independent power and importance which in Greek architecture it had not. Mr. Ruskin objects against the system of displayed masonry that nature leaves her mountain bases smooth. Now if we were prepared to receive this doctrine of requiring antitypes in nature for all that the architect expresses by his work, we should still hold that the Renaissance architects were not thereby condemned in their common practice, which was to justify any unusual lowness in their edifices by an appearance of unusual massiveness, obtained by increasing the force of the chamfered rustication. We readily admit, however, that the

Renaissance method of giving expression to the wall is gross and tautological when compared with the Lombard system of wall decoration. The baldest wall is far better than a surface badly or unnecessarily rusticated, as it often was, in imitation of some Roman example or other, by the Renaissance architects, and as it commonly is, with no such excuse, by modern builders.

Byzantine Construction.

The early Byzantines made a bold and unmistakable effort to create a style of architecture in which the semicircular arch should afford, not only the main principle of construction, but also the theme of the expression. "Arches rising over arches and cupolas over cupolas, we may say that all which in the temples of Athens had been straight, angular and square, in the churches of Constantinople became curved and rounded, concave within and convex without." In this attempt to obtain expression from the arch there was necessarily involved a change that seriously impaired the beauty of every building in which it was made. The object of the circular arch is the distributed weight of the wall, just as the object of the column is the entablature, or the wall concentrated upon its capital, by means of the arch. The Byzantines, however, made the arch the chief object to the eye, setting little importance upon the chief object of the arch, and the consequence is that an unpleasant sense of imperfect purpose is experienced by the beholder of most of the edifices in this style. A great resisting power, and one which immediately declares itself as such to the eye, is constantly and ostentatiously displayed, and little is given it to do. The natural upshot of this system was that the power, wanting its proper object, took to displaying itself in fantastical tricks, of which perhaps the most famous and most foolish is the dome of Sta Sophia at Constantinople. The chief boast of this dome—that it looks as if kept from falling down by a miracle, appearing thereby to justify its fabled origin—is, as Mr. Ruskin says, its chief artistical defect; this defect is purchased at an immense expense of constructional convenience, and, after all, the wonder is but a lying wonder, for that which the uninitiated spectator gapes at as a vast mass of legitimate masonry unaccountably suspended in air is a structure of Rhodian bricks and pumice-stone, possessing only a small proportion of the supposed force of gravitation, and exerting a lateral thrust which is met by a vast and hidden buttress system. This species of falsehood attained its climax in the dome of St. Vitale, Ravenna, which, while it claims credit for being constructed of stones put together upon the principle of the all-prevalent arch, is in reality a kind of grotto, formed by a coil of empty earthen jars. In the Romano-Byzantine, or Lombard style, the semicircular arch was set to do its right work, and for the first time it then acquired its true expression, which was wholly subordinated to that of the wall.

Moorish Buildings in Spain.

The exterior of Moorish edifices in general was plain, prison-like and forbidding; the object was to keep out heat and enemies, foreign and domestic, and to keep in women and disarm the evil eye, the great bugbear of antiquity, the East, Andalusia and Naples. The interior—all light, air, colour and luxury—glittered like a spar enclosed in a rough pebble, and the door once opened ushered the Moor into a houri-peopled palace which realised those gorgeous descriptions that seem to our good folks who live in brick and mortar, quiet drab and Baker Street, to be the fictions of Oriental poetry or the fabric of Aladdin's genii; yet such were the palatial fortresses, the Alcazares, the Alhambras of the Spanish Moors, and such on a minor scale were their private dwellings, many of which still exist at Seville, although dimmed by ages and neglect. The generic features are a court hidden from public gaze but open to the blue sky, and surrounded with horseshoe-arched corridors, which rest on palm-like pillars of marble whose spandrels are pierced in gossamer lacework; in the centre plays a fountain gladdening the air with freshness, the ear with music, the eye with dropping diamonds; on the walls around was lavished a surface of Mosaic decoration richer than shawls of Cashmere, wrought in porcelain and delicate plaster and painted with variegated tints; above hung a roof of Phœnician-like carpentry, gilded and starred as a heaven, while the doors and windows admitted vistas of gardens of myrtles, roses, oranges and pomegranates, in which fruit mingled with flower and colour vied with fragrance. The drawbacks of this poetry and picturesqueness were miserable bedrooms, an utter want of judicious kitchens, sculleries, offices and other necessaries of modern comfort and cleanliness. The religious architecture of the Moor, of which the mosque of Cordova (still so called) offers an example unique in Europe, differed alike from that of the Pagan, the Christian, and even the Asiatic Mahomedan. It had neither the porticoes, the peristyles, nor the proportions of the first, nor the narrow aisles and aspiring loftiness of the second. It differed from those in Hindostan, Cairo and Constantinople in the absence of pagodas and domes and in want of external ornament. The mosque at Cordova was certainly the model of all the others in Spain from being the metropolitan and the substitute for holy Mecca. The exterior was simple, the plain walls being supported by square pilaster buttresses, but the mosaics of the interior rivalled those of Byzantium in richness and brilliancy, and there they sparkle unchanged after a lapse of ten centuries, the edifice, wherever the Spaniard has not meddled, being fresh as when first finished, so much more conservative is the dry air of Spain than are those who breathe it. The type was the Roman basilica, which probably was itself derived from the East; the shape is a wide quadrangle, whose low roof is supported by a forest of pillars, from whence the indicial horseshoe arches spring. An eye for symmetry and proportion was no quality of their architects. These columns, torn from earlier edifices, differed in diameter no less than material and capitals, but the Classical and Christian orders never entered into Moslem buildings without being shorn of their original meaning, fitness and beauty; architecture, chaste and pure, seemed to shrink alike from the voluptuous harem as from the sense-subduing temple of the false prophet.

Artists and Designers.

In the Middle Ages and at the period of the Renaissance the distinction between artist and designer had hardly arisen. The great German, Flemish and Italian artists were not only the painters of altar-pieces, neither were they employed alone in decorating the walls of churches with the history of saint and martyr, but they designed the furniture of palace and church, the rich services for the banquet, the reliquaries, monstrances, chalices, the splendid candlesticks for the altar-table, even the hangings of the rooms and the robes of the priests. The architects were often at the same time both painters and sculptors, and they did not disdain to design, and often partially to execute, the interior decorations of the buildings they erected. Some of the most celebrated sculptors were equally celebrated as workers in metal, as delicate modellers, or as skilful chasers; and their handiworks in bronze, in gold and silver are still treasured for us in museums and collections. But gradually the range of the artist became more limited; those who practised as painters or as sculptors ceased to follow the cognate arts; the artist ceased to be the art-workman. The manufacturer arose, and then, in most countries, the relations of art to industry were relegated to a separate and, as it soon came to be considered, an inferior class of artists. Yet it must be noted that all great improvements in taste may still be traced to the follower of fine art stooping once more to ally himself with the manufacturer, rather than to those who had started as designers for manufactures advancing to greater taste and skill in their branch of the profession.

Mechanical Structure of Limestone.

According to Mr. H. C. Sorby the only satisfactory method of ascertaining the true structure of limestones is to examine thin sections of them with the microscope. Limestones have been usually described as more or less crystalline or earthy, but this has reference chiefly to subsequent changes, and not to their original condition. When examined with the microscope it is seen that to describe them according to their mechanical characters would usually be far better. In this manner they may be very conveniently classed as organic sands or clays, in the same way that we may speak of felspar sand or clay. The organic structure of the minute fragments of which they are composed is often so well preserved that their nature and relative proportions can be satisfactorily determined. When they have been consolidated the shrinking of the mass has often produced cracks and joints, afterwards filled with calcareous spar, and often presenting a beautiful appearance when examined with the microscope on account of their number and regularity, and showing faults of 1-100th of an inch, or much less. These are totally distinct from slaty cleavage, which can be studied to great advantage in such limestones as have that structure. The rocks that possess it have been so much compressed, as is shown by a great variety of facts, that the positions of their ultimate particles would be changed in such a manner as give rise to precisely such structure as that which produces cleavage. That this would be a necessary result may be proved both by calculation and experiment. In the case of limestones it is impossible to suppose that any other than a mechanical cause can have developed the structure seen with the microscope, because the particles whose position has been changed are fragments of organic bodies and not crystals. Besides this change of position, in many cases minute organic fragments, whose original form and structure are well known, are greatly compressed in the plane of cleavage, as shown by the change in their form and structure; and even crystals of dolomite are broken up, elongated, and their crystalline cleavage planes bent, thus showing that the rock was in a consolidated condition when the change of dimensions occurred, but that the pressure was so intense and acted so gradually that the whole mass of rock gave way like iron malleable substances, by the movement of the particles one over another.

NOTES AND COMMENTS.

ONE of the most certain causes for grumbling in summer and other times is found in the over-watering and neglect of watering London streets. It may be well, therefore, to read what can be said on behalf of the district boards and other authorities who are charged with the operation. In his last report to the Board of Works for the Hackney District, Mr. LOVEGROVE, C.E., the surveyor, gives the following account of the difficulties in working the watering department:—"The more important thoroughfares are watered three times a day in dry weather, other roads and streets twice a day, and a few unimportant streets once a day. The work provided for each van and cart, and the number of vans and carts, are dependent upon the requirements of the division. About seventy horses are required for road-watering on most dry days. A road well watered, when under a dry wind and a hot sun, will throw up dust in less than an hour after being watered. Not infrequently all the vans and carts will be horsed, and shortly after commencing work a fall of rain will render further watering unnecessary. On dull days, if the whole of the vans and carts keep on work, the roads are made muddy, and more harm than good is done. During the season there may also be from thirty to fifty damp or wet days when watering is not required at all, and most of the horses and men will consequently have nothing to do. The result of this is that the carmen frequently leave, and there is a constant succession of new men strange to the roads; then, notwithstanding the most careful supervision, the work is indifferently done. The whole matter is thus beset with difficulties." The report from which the extract is taken is the thirty-fifth presented to the Board by Mr. LOVEGROVE. It is not often so long a tenure of any important public office is witnessed, and the collection of reports will form an infallible record of the progress of the district.

JUDGMENT has been given by Sheriff BLAIR in the action commenced by the late Mr. JOHN RHIND, architect, Inverness, against Sir JOHN RAMSDEN, Bart. The account in dispute was incurred in connection with the building of Ardverikie Castle. The defence was that the architect greatly overcharged, and that there was a contract between the parties stipulating for a lower rate of commission. Sheriff BLAIR has decided that the sum of 2,300*l.* is the fair value of the work done by Mr. RHIND specified in the account sued for, and that 1,600*l.* has been paid to account. He gives judgment against Sir JOHN RAMSDEN for the balance, and finds that the defendant has failed to establish his claim for damages.

WE have several times referred to the commission undertaken by the late M. MEISSONIER for the production of a panel which was to form part of the decoration of the Panthéon. At the time when the scheme was proposed the building was used as a church, and accordingly it was arranged that the paintings should represent scenes in the life of St. GENEVIÈVE, or ecclesiastical events like the crowning of CHARLEMAGNE. To M. MEISSONIER was assigned *St. Geneviève saving Paris from Famine during the Siege by the Franks.* That he should accept the commission amazed his friends, for the figures would have to be on a large scale, and he could not paint one successfully that was a foot in height. Such power as he possessed failed him when he went beyond works in miniature. M. MEISSONIER appeared to realise to some extent his incompetence, for a long period elapsed without a sketch appearing. At last he sent one to the Minister of Fine Arts, but it bore no relation to any of the legends of St. GENEVIÈVE, for the subject represented was the siege of Paris in 1870-71! The Minister expressed disappointment, which gave occasion for a display of M. MEISSONIER'S choler. After a time he proposed to fill the panel with a composition that would suggest the triumph of France, who was to appear on a chariot, in the form of a pretty woman, drawn by lions, and accompanied by Prudence and Force. As M. MEISSONIER never succeeded in painting a female figure, he was planning failures for himself. The description of the work pleased the official mind, and the composition was approved. But the death of the artist occurred before the work was really commenced. It is now proposed to carry out the design by other hands. Applications are invited from artists, and whoever is selected will have to realise M. MEISSONIER'S design without any alteration, because it gained official approval, or will have to interpret in his own way the subject originally proposed to M. MEISSONIER, that is, the siege of Paris. It is needless to say that any artist who has gained reputation will prefer the alternative scheme.

A SECOND edition of Mr. LEWIS F. DAY'S manual on "The Application of Ornament" has been published by Mr. BATSFORD. There is little difference between the two editions, which is an advantage. Fortunately there was nothing in the little book when it first appeared that might be considered as compromising to the author as an official examiner of the Science and Art Department, and in consequence the pages do not reveal any sacrifice of the original plain speaking. There are a few most trifling alterations, as in the case where Mr. DAY wrote, "The Corinthian capital and the acanthus scroll, even when they most nearly approach nature (which is never very closely) are always modified according to the conditions of sculpture," which sentence is now altered in this way, "The acanthus leaf, whether in scroll or capital, and when it nearly approaches nature," &c., which is somewhat more precise. As Mr. DAY thought out his subject before he contemplated his book, there were not many opportunities for emendation. It is needless to again describe the character of the chapters. Mr. DAY writes frankly as a designer to designers, and his pages not only explain a rational method of applying ornament, but also point out by apt allusions the obstacles which arise from defective theories, fashionable whims, and an unsatisfactory business code. Everything in the book is to the purpose, and it would be easy to have utilised the materials for a much larger volume. By the production of such a series of text-books Mr. DAY has well served his countrymen who are art students, not only by presenting the results of his own experience as a designer, but by a suggestiveness that must compel them to think.

THE villa which has been erected at Villefranche-sur-Mer for the Marquis of SALISBURY has furnished M. GASTON POLLONNAIS with a subject for description. He says the site is not accessible, and consequently, curious people who wish to visit the place will suffer some restraint. There is also a board inscribed "Défense d'entrer." The Marchioness, it appears, prepared the plans, and the result is, says M. POLLONNAIS, a curious mixture of British comfort and southern romanticism. The house is of two storeys, and there are twelve small square windows in the façade. On the first floor, which has an exterior gallery, are the dining-room, salons and billiard-room, all of them being spacious and communicating with one another. They are arranged to allow a very free circulation of air. On the second floor are the bedrooms. There is a small tower in the Italian style, having a belvedere from which views of the glorious landscape around can be enjoyed. Wall-papers have been rigidly excluded, and the walls are painted in oils. Most of the accessories of construction and the furniture were obtained in France. "If I were indiscreet," adds M. POLLONNAIS, "I would speak of the letters to the contractors from the Marchioness of SALISBURY, which might serve to form the manual of a perfect architect." It is needless to say that all the workmen employed are enthusiastic about the abilities of their *patronne.*

THE whole of the share capital, amounting to 150,000*l.*, having been subscribed for by 1,200 shareholders, it has been arranged to lay the foundation-stone of the Blackpool Eiffel Tower on Friday next, the 25th inst. The architects are Messrs. MAXWELL & TUKE, of Manchester, who are now engaged in preparing working drawings. An effort will be made to have the structure completed in order to be utilised in the summer of next year.

THE architecture of Exeter is well illustrated, and on a large scale, in one of the pictorial series now being brought out by Mr. J. L. ALLDAY, of Birmingham. The cost of the new folio is a shilling, and it is rare to find so much value given for so small a sum.



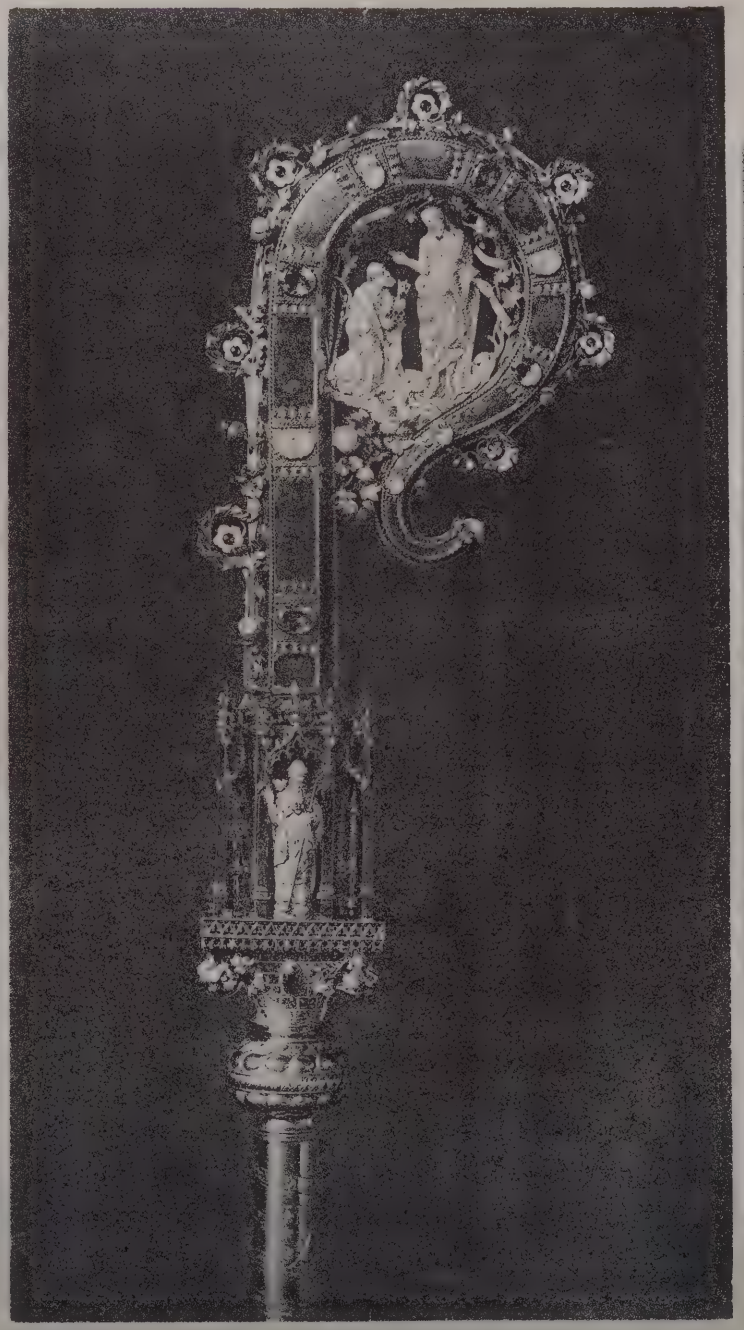


S. CLEMENT'S CHURCH, BOURNEMOUTH: NEW TOWER.

The late JOHN D. SEDDING, Architect.



ALTAR CROSS (for a Church at Boston, U.S.A.).



PASTORAL STAFF: ST. DAVID'S.



CHALICE (for a Church at Boston, U.S.A.).

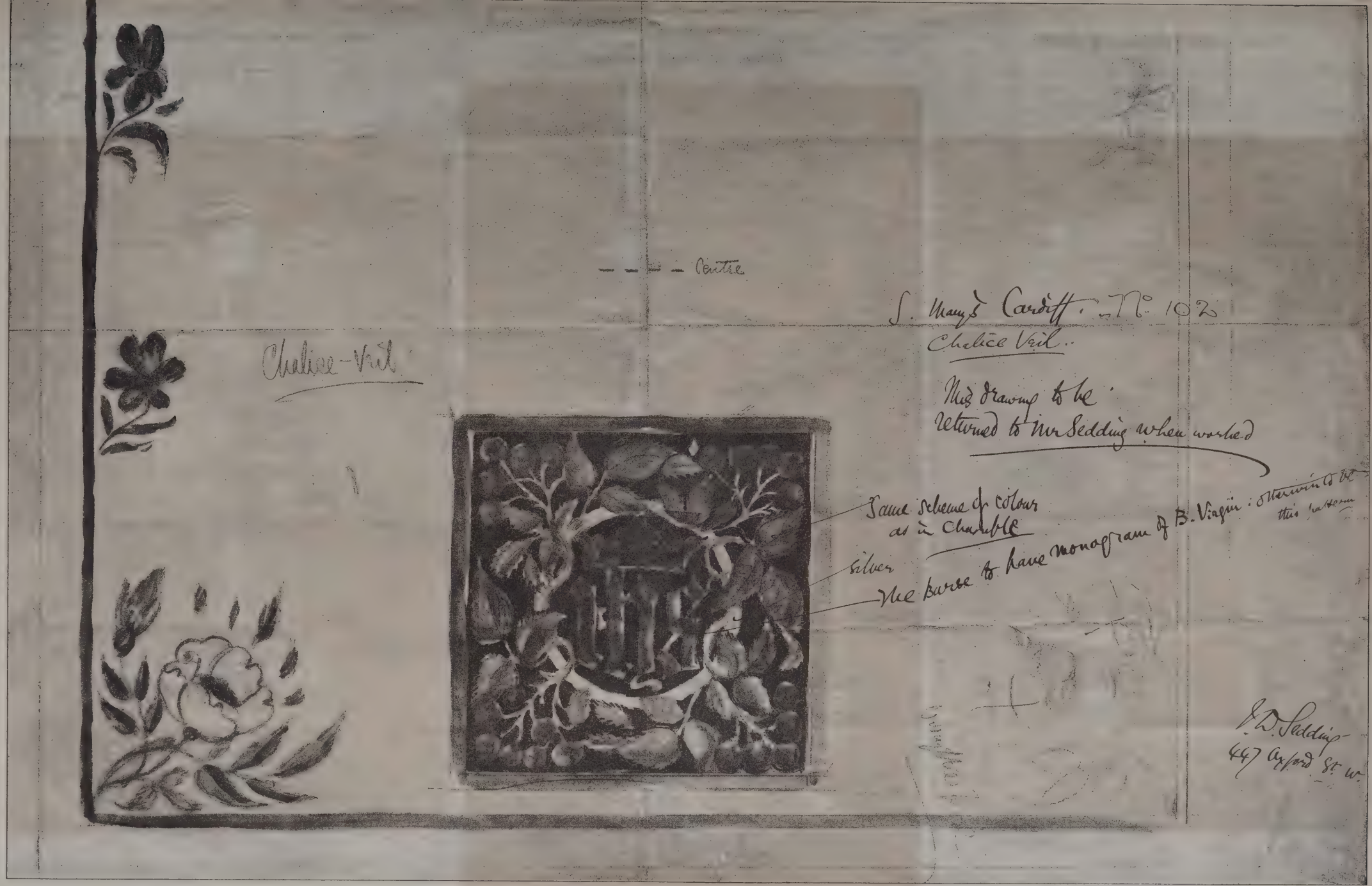
WORKS IN METAL.

The late JOHN D. SEDDING, Architect. Made by Barkentin & Krall.

INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

The Architect, Sept. 18th 1891.

Architectural Illustration Society. Second Series. Plate N. 408.



DESIGN FOR CHALICE VEIL: S. MARY'S, CARDIFF.

By the late JOHN D. SEDDING.

INK PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

The Architect, Sept 18th 1891.


BUSINESS PREMISES
IN
DAVIES STREET
GROSVENOR SQUARE W.
FOR
Messrs BOLDING & SONS.
J.T. WIMPERIS & ARBER
Architects



INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 408.—WORKS IN METAL. [THE LATE J. D. SEDDING.]

NO. 409.—DESIGN FOR CHALICE VEIL. [THE LATE J. D. SEDDING.]

NO. 410.—NEW TOWER, ST. CLEMENT'S, BOURNEMOUTH. [THE LATE J. D. SEDDING.]

NEW PREMISES FOR MESSRS. BOLDING & SON.

THE building designed by Messrs. WIMPERIS & ARBER to accommodate the extending business of Messrs. JOHN BOLDING & SONS, in Davies Street, Oxford Street, was lately opened. It has been arranged so that all the departments, with one exception, can be engaged under one roof. In that way there is security that the best work will be brought to perfection, as the superintendence can be thorough and comprehensive. Thus the sixth floor is occupied by the marble masons, who prepare the highly-finished lavatories, baths, &c., and the fifth and fourth floors by the engineering department, brass fitting, &c. The ordinary gloomy workshop is transformed into a bright, sunny, airy, comfortable room, that would satisfy an artist. The top floors communicate with show-room basements by means of a large lift. An iron staircase fire-escape is accessible from every floor, and the whole building is fireproof. In the show-rooms all the different patterns of closets, for instance, some hundreds, can be placed side by side, and as the water is connected, a practical illustration of the merits of each is given. The "Simplex" and the "Kenon" are the two best known, and are in universal use. Baths of different sorts and sizes are also grouped together, at prices to suit "all sorts and conditions of men," and it is surprising to see how cheap some of these luxuries are—a porcelain lined bath, for instance, with shower fittings attached, for 8*l.* 15*s.* The different kinds of urinals are placed together—automatic, treadle and otherwise—including the patent "Simplex" disconnector, one of the latest improvements. A small department is devoted to electric light fittings, &c.

THE PITT-RIVERS MUSEUM.

A CORRESPONDENT of the *Times* gives the following account of the Farnham Museum:—The correspondence which has arisen upon the subject of county museums has drawn attention to the existence of many such institutions in various parts of the country, and has raised high hopes of future developments in the breasts of many local archæologists and antiquarians. If the village council be held, as it is by some, to be the logical outcome of the county council, by parity of reasoning the village museum should also be a reformer's end. This is an amplification of the leading idea which does not seem to have presented itself as a rule, but a precedent already exists in the loneliest, most sparsely-populated corner of North Dorset in a tiny village called Farnham. It is the last place in the world that one would expect to find so advanced a product of civilisation and culture, and one's wonder is only increased at learning that it is as freely open on Sundays as during the week. It is the public-spirited gift of General Pitt-Rivers, F.R.S., to his tenantry and neighbours, and so far from being "a shooting-place for all rubbish," as it has been irreverently suggested that the local museum would become, it contains the results of the General's scientific researches into the abstruse question of the Romano-British occupation of the south-west of England, in addition to an extremely interesting collection of artistic, industrial and agricultural objects.

The history of this novel experiment is soon told. Before General Pitt-Rivers presented to the University of Oxford the art and anthropological collection which there is associated with his name, he reserved for his own purposes such objects as he considered might possess an educational or improving meaning for rustic eyes. The opportunity to put his theories into practical shape arose when he inherited, as next heir, the Rushmore estate on the death of the last Baron Rivers in 1880. Farnham itself, with a population of about 200, lies about two miles from Rushmore Lodge, the residence in the palmy days of old Cranborne Chace of the chief ranger. The nearest towns to this most typical Dorset parish are Shaftesbury and Blandford, both of which are eight miles distant, while Wimborne is eleven and Salisbury seventeen miles from it. Curiously enough, Farnham some thirty-five years ago had been the scene of another essay in advance of the times, and a large school had been built and partially endowed by several of the squires and clergy for the reception and training of gipsy children. The institution struggled on for a few years against the dispiriting behaviour of the nomadic parents, who were willing enough to leave their children to be comfortably housed during the winter, but insisted on taking them away for the summer months. When the effort was finally abandoned, the house, which was a capitally-built one, with large and well-planned rooms, remained vacant until it occurred to General Pitt-Rivers to use it in another way for the benefit of his poorer friends.

The collection most strongly appeals to local sympathies. Standing as it does in the very centre of the district from which General Pitt-Rivers has made his most striking anthropological discoveries, these naturally occupy a leading place in it. Nor is it surprising that the rustic of the villages round should take an intelligent interest in seeing the results of these researches, for he has known that they have been patiently carried on upon the chalk downs, and the names of Woodcutts and Rotherley are perfectly familiar to him. Moreover, with the close intermarriage of village families and the direct personal acquaintance he has with his neighbours, he has heard quite enough about the investigations to realise that biographical element which Mr. Herbert Spencer tells us is so essential to sincere interest in the uneducated mind. Once enter the museum, and every point is so clearly brought forward that the veriest dullard could not fail to understand it, even if he had not ever seen the actual field of the discoveries. Diagrams and models illustrate the exact spot in which every bone or coin or vase was found. A concisely-written, clearly-printed label explains exactly what every object is and its use to those who made it. In the case of animals' bones, further light is thrown upon the subject by judicious comparison, and the rustic sightseer grasps a point when he sees placed side by side with them the pictures of their nearest modern type. For instance, the Exmoor pony may be taken as a close approach to the horses used by the Romanised Britons in this district, the Kerry and Alderney cattle convey a fair idea of the size and stamp of their oxen, and the very light-limbed sheep of St. Kilda and the half-wild Dorset horned sheep from the open heath country verging upon the New Forest represent their sheep. A curious fact about the wheat grown by the Romano-Britons has been proved by General Pitt-Rivers, and is, of course, amply illustrated. In the barrows of pre-Roman days the grains found by him were of minute size (655 grains to 681 grains to the cubic inch), but in those of the joint British and Roman period of occupation they were vastly improved, and the record of 323 grains to the cubic inch found in the Woodcutts barrow is the same as that made by the present tenant upon whose farm the barrow stands. Of course there are quantities of metalwork, weapons, pottery and coins, for every fragment discovered was carefully examined, and not a stone or a shred of wood that would give the slightest suggestion of human handicraft was passed by, and the result is that one can judge exactly the degree of civilisation possessed by the curiously small race who lived upon this range of chalk downs and in the woods of this part of Dorset and Wilts. Their average size is conclusively shown here not to have exceeded 5 feet 2·6 inches for the males and 4 feet 10·9 inches for the females, but whether they were the last survivors of the neolithic population as they were driven further and further westward, or the remnants of the sturdier race of true Britons, even the Farnham Museum does not attempt to decide.

But anthropology is only one section of this well-planned little institute. It is perhaps the one on which the educated visitor dwells longest, on account of the marvellous patience and careful deductions which General Pitt-Rivers has revealed, though beyond it are the rooms filled with specimens of curiosities, needlework and china most likely to awaken interest in rural minds. Several typical national costumes are shown. There are examples of the brutal man-traps that were frequently used by the keepers on the Cranborne Chace for the protection of the deer against the daring poachers; but unfortunately there is not a suit of the leather and straw basket-work worn by these guardians of game rights and sport. The development of the local, or "Verwood," pottery, from the rudest baked clay up to comparatively good glazing and improved form, is shown, and there is a really interesting collection of "tithe" mugs, with their rhymes none too friendly to the parson, as valuable in its way as Mr. Willett's extraordinary assortment of crockery relating to the navy and its heroes in the Nelson Gallery of the Royal Naval Exhibition. "Puzzle mugs," too, are there in several quaint forms, and there are several very good pieces of Breton carved oak furniture as an object-lesson in peasant handicraft. Cooking utensils, old and new, English and foreign, also find a place, while the collection of homely needlework does not ignore the smock-frock or the samplers with square trees and halting verse worked in cross-stitch. Outside, in the trim, well-kept grounds is a long shed filled with primitive agricultural implements collected from all parts of the world, literally from Scandinavia to the Malay Islands.

It would be giving an incomplete account of the museum if

its two auxiliary attractions were not also noticed. At a short distance from Farnham is the village of Tollard Royal, not wholly unknown to antiquarian fame, on account of possessing in its little church the monument to Sir William Payne, who died about 1388, which is one of the only five examples known of banded mail. In this parish stood an old farmhouse, traditionally associated with the name of King John, but having little external evidence of age about it. However, it chanced to fall vacant, and a careful examination was made of it. Evidences of indisputable Tudor work soon revealed themselves, and some fine Elizabethan windows clumsily bricked up were found. In investigating these a yet more interesting discovery was made, of a thirteenth-century window with stone seats closely resembling those in Acton Burnell Castle, and similar to those in the room of Lochleven Castle in which Mary Queen of Scots was kept a prisoner. Among the curiosities discovered in the process of restoration was a spur, almost a facsimile of the one upon the effigy just mentioned in the church close by, and a coin of Henry III., which were proof that a dwelling-house existed here in the succeeding reign, and gave decided support to the legendary connection with His Majesty of Magna Charta memory. This house, with the beautiful Stuart oak-panelling on its walls, which had been buried under stucco and paint, now has one room devoted to the villagers of Tollard as a reading and recreation-room, while the rest contain some seventeenth-century carved oak furniture, and a collection of pictures to illustrate the history of painting, from its origin on Egyptian mummy cases up to the present day, and including examples by Margaritone, Jerom Bosch, from the schools of Florence and Siena, by Sassaferati, Rubens, Quintin Matsys, Tintoretto and George Morland. Some odd specimens of the old "stump" embroideries are also here. At a few hundred yards' distance from this stands an historic old wych elm, marking the juncture of the two counties, and known as the Larmer tree. It is supposed to have been the meeting place for the chase in earlier days, but it has now been made the centre of a charmingly-planned pleasure garden, at which, on Sunday afternoons, the band, conducted by the village organist, and entirely composed of the labouring men from the two parishes, plays a selection of music between 3 and 5 o'clock. Flower beds and seats abound, and one of the treasures of the garden is a bronze, given for it by the late Sir Edgar Boehm, of *The Savage Hunter*. Naturally the first question asked after a visit to these three places is, "Do the people come to them?" They are, of course, open free, the only condition of entry being a signature in the visitors' book. Last year's books showed that 6,500 people had been to the museum, 14,300 to the Larmer tree, and over 3,000 to King John's house, which was not open until May. The same names recur constantly, and the behaviour and order have been perfectly satisfactory. That is an all explaining answer, and the fact may certainly not be without its value in the present discussion upon the question.

A LEASEHOLDER'S LAMENT.

THE following epistle from Mr. C. Thorp appears in the *Times*, and suggests the kind of opinion which prevails in London about some classes of house property:—

In these days of suffering and impoverished landlordism, it must be cheering to that down-trodden race that the wheel of fortune sometimes gives a half-turn in their favour. From the days of the ungrateful servant in the parable, it has always been clear that a certain grim pleasure, arising probably from the sense of power, lies in the oppression of others. A leaseholder smarting under a recent infliction, justified by the law, may, through his solicitor, be excused in the dull season if he endeavours, by a narration of his wrongs, to interest the holiday-making public, and warn investors in respect to leasehold investments.

A covenant to repair has not many terrors for the well-to-do residential leaseholder. In the first place, the landlord seldom raises any question during the term of the lease, and that for two reasons. The pride and self-interest of the tenant forbid him to let the premises deteriorate, and the landlord can drop upon him for that mysterious thing called dilapidations at the end of his lease, when a new tenant looms into view. But it is different with that class of property which is purchased as an investment, and intended to be sublet either to quarterly, monthly or weekly tenants. These are not responsible persons; they are a nomadic race, and they are not bound to repair. They construe this exemption liberally. If they do not make firewood of the doors and the floorboards, their immediate landlord feels a thrill of gratitude. But, even short of this, property of this class very seldom remains long in good order. Whatever their landlord (that is, the unfortunate leaseholder) may do in the shape of repairs is speedily undone by his kaleidoscopic tenantry. Like the Laureate's evanescent humanity, they come and go. The woodwork is treated with a rough familiarity, to which it soon succumbs. Paintwork does not escape unscathed; wall-papers hang in picturesque ribbons; sanitary works, pipes and such like, are looked upon with hearty contempt; at any moment it is safe to assert that the repairing covenant is in a condition of breach; and here comes the opportunity for the ground landlord to make his legal "pounce" just as if he were a First Lord of the Treasury manipulating the closure rules.

Up to the year 1881, the penalty for letting property get out of repair where the lease prescribed the obligation to repair, and where there was (as was almost invariably the case) a power to the landlord to re-enter on breach of covenant, was of Draconic simplicity and severity. The landlord could put an end to the lease and eject the tenant. The fact that the lessee had spent hundreds of pounds on the land under the superintendence of surveyors, that the lease comprised many houses underlet to several under-lessees and sub-lessees, and that the defect of repair only existed in one of them, availed nothing. Immediately the want of repair was verified, the right of the landlord to resume his absolute proprietorship over all the property arose; he could bring actions of ejectment; and perfection of repair when the actions came on for trial could not be set up as a defence, the breach of covenant being incapable of a healing process of this kind. Having regard to this state of the law, it is astonishing that it was so seldom taken advantage of by landlords. Perhaps there were two reasons for this—one, because the obloquy attaching to such an obvious piece of robbery deterred even those who would not have been restrained by mere morality; and, secondly, because a landlord who adopted such a course might find it difficult to procure future tenants. There was, of course, another remedy; to bring an action for damages for breach of repair, the result of which was, as a general rule, that the repairs were put in hand, the costs of the landlord were paid and the action stayed.

Although, as has been said, the instances in which an unfair advantage was taken of a neglect to repair were few, there was a want of security for lessees which induced the Legislature to interfere. A section of the Conveyancing Act of 1881 stays the enforcement of every landlord's right of re-entry for breach of covenant until he has given notice specifying the breach complained of, and requiring the lessee to remedy it and make compensation for it, and it is only on non-compliance for a reasonable time with these requirements that the landlord is permitted to proceed to recover the land. Furthermore, even on default by the lessee, the Court can relieve the lessee from forfeiture on such terms as it may think fit. There are a few exceptions, which need not now be noticed, to the range of covenants to which the section applies.

On the face of them, these provisions appear highly beneficial, and in many cases their operation is, no doubt, such as the framers of the Act intended. But in other cases, and notably in the case of weekly properties, no such result follows, a proceeding by a landlord in conformity with the Act brings no obloquy upon him, and moreover, in the majority of instances, the sufferings of the tenant are not brought to the light of publicity, and, as a matter of fact, the working of the Act is attended with positive disadvantage to many deserving lessees.

This operation may be thus succinctly stated. The landlord gives the statutory notice. The lessee takes immediate steps to put the property in repair in accordance with his covenants. Suppose the property is a weekly one. In November, perhaps, he has, as he considers, so dealt with the property—under the careful superintendence of an experienced surveyor—that no fault can be found with him. But what is the course of the landlord? He will not allow his surveyor to inspect the property immediately the tenant has repaired it. He knows that a winter is fast approaching and that if it should prove a severe one it is probable that, with the active and unstinted assistance of the occupiers, the property will necessarily run down. In February, perhaps, the landlord's surveyor inspects the property. He then, of course, finds numerous defects of repair; the "reasonable time" has expired; the breach so called (not the breach mentioned in the notice, it is to be observed, but a new breach altogether) is unmistakable. A writ of ejectment follows. What is the lessee to do? He may possibly be advised to go to trial and assert that he fulfilled the conditions of the statutory notice under the superintendence of an experienced surveyor. But *primâ facie* he is in the wrong, since at the moment when the writ was issued the property was certainly out of repair, and a war of testifying surveyors is an expensive procedure. So that probably he will be recommended by his advisers to apply for relief from forfeiture under the statutory discretion given to the Court. He does so, and thereby inevitably admits himself to need relief, and, consequently, that he is in the wrong. Then begins a conflict of evidence on surveyors' affidavits. Of course, according to an immutable law, they see with their employers' eyes, and their views are irreconcilable. The learned judge finds himself bewildered. If A says a wall is in perfect, even superfine, condition, and B says it is ruinous, how is the most experienced judge to decide between them? True, he may go and inspect the wall; but it is rather too much to call

upon Her Majesty's judges to go tours of inspection of this kind, to the purlieus of the East End, it may be, to some secluded suburb, or even further. So his lordship exercises his discretion, and wisely exercises it, by appointing an official surveyor to examine the premises and make his report. He does so, and no doubt fairly. But of course he differs from both the other surveyors. Well, the report comes to the judge, who perforce adopts it, and orders the official surveyor's directions to be carried out. The hapless lessee does so to the best of his ability, and after two or three unsuccessful efforts the official surveyor is satisfied, and all seems in train for settlement. These various proceedings, however, are not carried through as a labour of love. Neither lawyers nor surveyors argue and inspect, wrangle and report, for nothing, and if a considerable amount of costs and expenses have been incurred which are inevitable, somebody must pay them. There is no national fund for the purpose. The landlord is technically and legally in the right. The lessee has, but for the terms of the Act of Parliament, incurred forfeiture. The judge has power to relieve forfeiture "upon terms." What terms shall he impose? That is a question entirely for his lordship. But if he orders the unfortunate lessee to pay all law costs and the expenses and fees of the three or more industrious and able surveyors, can it be said that the discretion is not well exercised?

What, then, is the remedy? One drastic and unfailing remedy for himself the impoverished lessee will probably apply at once, by selling his well-repaired property, and registering a secret oath that he will never more seek leasehold investments, and will even prefer the securities of the Argentine Republic. For there is a *da capo* principle in the procedure which has been described, and a legal war at somebody else's expense is not without its charms. But there is another remedy, which many persons of well-regulated minds have shrunk from as a species of confiscation, and this is the principle embodied in the Leasehold Enfranchisement Bill, and an oppressed lessee can scarcely be blamed if he becomes converted to this principle. Vacuous of pocket and harassed in spirit, he may, though perhaps no longer a leaseholder himself, look complacently at the litigating landlord being bought out at a valuation, and will not sigh if it be a low one.

ST. MARY'S ABBEY, DUBLIN.

AN obscure street in a very poor part of our city, a few fragments of broken walls, a ruined arch or two, the remains of an ancient and once beautiful apartment, such and such alone, says an able correspondent of the *Irish Times*, are the sole surviving relics of an institution once great and famous and rich. All that is left to us now in the closing years of the nineteenth century of what was for centuries one of the most splendid and most renowned of Irish monastic foundations—"the ancient and noble Abbey of St. Mary, near Dublin," sometimes called the Monastery of St. Mary, Ostmantown, since the Abbey buildings spread over a part of that fair suburb of old Dublin town anciently known as the "faire green Commune," or Village of Ostmantown, on the northern bank of the river Liffey. In this same village of Ostmantown, or as we now say Oxmantown, there was situate a parcel of ground known as "The Pill," being part of the estate (so we read) "of the Honourable City of Dublin," which part, it is worth while to add, was let by a lease for ever, dated May 20, 1662, to James, Lord Baron of Santry. Along the eastern side of this "parcel of ground" is to be found the ancient site of the walls of St. Mary's Abbey, which passing from the angle of Johnson's Alley to the west corner of the Watchhouse of St. Mary's Parish, on the south side of Little Strand Street, terminated at a point on Upper Ormond Quay near the corner of Capel Street, and a few yards above Essex Bridge. Over this extensive portion of ground stood the great monastery. The demesne attached to the Abbey has been defined thus:—"Commencing at the entrance gate near the corner of what is now Pill Lane, it extended south through White Lyon Court to the river, and north through East Arran Street, Green Street, Henrietta Street, and included a large and now undefinable area towards the last." If the buildings and the surrounding demesne of this famous religious house were extensive and splendid, its temporal possessions would seem to have been equally great, for we read that its broad lands were to be found in half the counties of Ireland, and these, the gifts of its rich and pious benefactors, yielded to the abbey a yearly revenue which was in truth no mean income. The story of this historic abbey is the story of every human institution. It sprang into existence, lived its little day and in due course perished, leaving as its heritage only a memory, and here and there a trifling vestige to attest to the generations to come the very fact of its existence and its importance in the history of the land. Whence came this famous monastery we know not. The date of its foundation, the names of its founders are wrapped in the thick darkness of the long distant past. Tradition, conjecture or speculation on the subject are rife enough. It has been said that "the credit lies between an Irish king, a Leinster chief and the Danes," and to each of these originators of its being there is attached a certain amount of plausibility in behalf of their several claims. According to some native historians the Irish king just mentioned was Melachlin, or Malachy the Great, the first of that name, who was monarch of Ireland, whose reign commenced in A.D. 846, according to the annals of Innisfallen, or one year later, if we can believe the "Four Masters," and who died in 862, while in an ancient MS. entitled "Triumphalia Chronologica S. Crucis," written by one Father Hartry in 1640, the origin of the abbey is ascribed to "Malachy, King of Meath and Ardrigh of Ireland, and Gillemoholmac and Rose, his wife, who were vassals of the aforesaid king, and dwelt at the time on the very site of the monastery." On the other hand, however, many historians and writers cling to the opinion of a Danish foundation. The fact of its being situate in the Danish colony and district of Ostmantown lent considerable colour to such a theory. Thus argues Archdall, adding as follows:—"It is not likely that the native Irish would attempt to establish a religious house in the vicinity of foreigners with whom they were usually in a state of warfare." Against this, however, must be set the fact that, so far as we know, the Danes did not until the year 948 embrace the Christian faith, and we learn on authority that the second abbot of St. Mary's died forty years before that date, namely, on January 19, 908. Equally uncertain and defective is any record of the names or period of rule of the earlier abbots. We are told that the name of the first abbot was James, and that he died on January 11, but history is silent as to the year in which his death took place. The death of the second abbot occurred, as we have just said, in 908, yet from that time to the year 1113, a period extending over upwards of two centuries, history is again absolutely silent as to the existence of the abbey or those who dwelt within its walls. In 1113 we read that the "Abbot Michael died," while in 1132 Abbot Everard, "an Ostman" (or Dane), died on April 10. M'Gregor, in his "Picture of Dublin," published 1820, cites this special mention of the Danish abbot as an argument against the theory of a Danish origin, "for," he says with some reason, "if the Danes were the founders it is more that probable the abbots would be of that nation, and therefore it would not be noted as an extraordinary occurrence that this abbot was an Ostman." From the death of this Abbot Everard to the final suppression of the abbey in 1537 the list of abbots is apparently complete. In 1238 the following is recorded in the annals of the house:—"1238, Felix, Lord Archbishop of Tuam, of pious memory, died, who caused the church and steeple of our Blessed Lady's House near Dublin to be covered with lead, and was honourably buried in the chancel of the same church at the steps of the altar, on the left hand." This ecclesiastic was Felix O'Ruadan, and uncle to King Roderick O'Connor. Resigning his See in 1235, he retired to spend the remainder of his days in St. Mary's, Dublin, and, as we have seen, died there. Long, long afterwards, in the year 1718, it is said that there was discovered by some workmen, while digging in the ruins of St. Mary's Abbey, the uncorrupted corpse of a prelate clad in full pontificals. Lynch, in his "Life of St. Patrick," records how the remains were supposed to have been those of Archbishop Felix O'Ruadan, and how, when the then Protestant Archbishop of Dublin, Dr. King, was consulted as to what was proper to be done, his reply was, "that it would be a pity to dispossess the honest gentleman of the place he held for so many years peaceable possession of," and so the body was reinterred again in the same place, and not removed to St. Mary's parish churchyard as some persons had advised. In the later operation made a few years since for the purpose of tracing out the plan of the old buildings of the abbey this interment was not found, though we are told that many indications of ancient graves, both within and without the building, were plainly to be seen during the exploration of the ancient floorings. Speaking of these later excavations, we must add that they were undertaken in the year 1886 by some gentlemen who owned property in Mary's Abbey and Meetinghouse Lane, with a view to the investigation of the few remaining fragments of the great buildings of the old monastery. To these investigations, undertaken in the cause of historical and archæological interests, we owe our present knowledge of what the plan of the ancient abbey must undoubtedly have been. We know that from its foundation to the year 1139 the abbey was under the Benedictine Order, but in this last-mentioned year it was granted to the monks of the great Cistercian Order, then rapidly rising to such splendid pre-eminence among the religious orders of the Middle Ages, and the Benedictine Friars were compelled by the Pope's legate, Malachy O'Morga, to conform to the Cistercian rule. Previous to this, in 1304, a fire had destroyed the abbey, together with its church and steeple. Some idea may be gained of the position which this great religious house occupied at that time by the fact of its being the repository of

the Rolls of Chancery, all of which, to the twenty-eighth Edward I., we learn, were burned in this self-same fire, except two of that year, which were in the hands of the Chancellor. While speaking of the dignity of the abbey it may be added that the abbot sat in Parliament as a baron of the kingdom, and was third in rank among his order. Of the buildings which the Benedictines had erected no trace now remains. So far as recent research has resulted, it is the unanimous opinion of those most competent to judge in the matter that all that now exists of St. Mary's Abbey proves it to have been built, or probably after the fire rebuilt, in the purely Cistercian method. But before we speak of St. Mary's as it now is, it is well worth while to turn aside for a moment and glance back at the history of that great monastic Order which in the Middle Ages, and for subsequent centuries, attained a power and magnificence throughout Christendom scarcely, if ever, equalled by any similar confraternity. To the Cistercians, those monkish builders of Mediæval times, England owed the buildings, even at this moment unsurpassed, which made the Cistercian monasteries of Bolton, Fountains, Furness, Rievaulx and others throughout the land the wonder and admiration of generations, even to the close of the nineteenth century. An offshoot of the Benedictine Order, the Cistercian, arose in Western France towards the close of the eleventh century. From three brothers of the abbey of Molesme, in Burgundy, who, much distressed by the laxity and low tone then so prevalent in the Benedictine Houses, finally withdrew themselves from the monastery to which they were attached, and seeking a resting-place in a deserted district in the diocese of Chalons, established there, in the year 1098, under the protection of Otho, Duke of Burgundy, a little religious community known as the Convent of Citeaux, this great and powerful Order had its being. The rule of life differs from that of St. Benedict, though founded upon that Order, in being from the first infinitely stricter and more rigid in its discipline. Ultimately, the Order departed almost entirely from the original rule of St. Bernard, and in this change, which took place about the end of the thirteenth century, we find also that great and lasting differences arose not only in the internal economy of their houses, but also, and very markedly, in the actual structure of their abbey buildings themselves. Previous to this, however, the Order had begun to increase both in numbers and in reputation in a manner extraordinarily rapid. In the two centuries which followed 1,200 abbeys were built and endowed, while it is said that at the time of the Reformation the entire number of dependencies possessed by the Abbot of Citeaux had reached 3,200. It was in the twelfth and thirteenth centuries that the especial capacities of the Order in architectural achievements came into notice. To that period belongs all that is best of their building work. Speaking of the peculiar and distinguishing characteristics of their work, one writer on the subject has said :—"I do not know one (*i.e.* one monastery) the general plan of which is not in accordance with that of all the rest, nor a single church which does not bear in its details the impress of its Cistercian origin. . . . Variations occur, as a matter of course, but they are mostly of slight importance, and are, in fact, of the nature of those exceptions which tend rather to prove the rule than to invalidate it." The writer goes on to say :—"The first thing that strikes us on approaching one of the abbeys of the Cistercians is the nature of its site. They appear to have invariably selected remote situations, at a distance from towns—generally in a valley, and in the narrowest part of the valley—with a view apparently to complete retirement and seclusion. In France and Germany this appears to have been the almost invariable custom of the Cistercians. In England situations of this kind were perhaps more difficult to meet with ; still, I know of no single instance in which this general practice has been departed from, or the valley deserted for the high land." Now, as we come back to that Cistercian abbey which in the days long dead stood so proudly looking across the river which swept beneath its windows to the ancient city of Dublin, we can see that the monks of St. Mary's departed in nowise from their English and foreign compeers in this respect. They sought a quiet and sheltered seclusion ; they could find such in the old Danish village on the northern bank of the river Liffey. Let us remember that not for many a year after the edict had gone forth which robbed the abbey of its revenues and emptied it of its inhabitants was the ground lying north of the river (now so densely populated) enclosed or built upon for human habitation. During all the years that St. Mary's Abbey flourished as a great religious community only one parish church existed in what we now call the north side of Dublin. This, the old Danish church of St. Michan, stood also in Ostmantown, and it is said, with what authority we cannot say, that between this church and the old abbey there ran a subterranean passage which communicated each with the other. But peculiarity of situation was accompanied in Cistercian foundations with certain fixed peculiarities of structure. Almost all their buildings had certain broad features in their erection and arrangement common to all.

Thanks to the extensive investigations of 1886, we can now see all that remains of the once famous monastery of St. Mary's, while we are further enabled to picture to ourselves a Cistercian abbey as it must have appeared to the citizens of Dublin six centuries ago. And to set such a picture before you now we cannot employ any better method than by recapitulating the results, already published in one form, attained by those latest investigations. Of these the most interesting and important result was beyond question the discovery of the ancient chapter-house. This, according to an account subsequently printed and published, was much as follows. In investigating the relics of the abbey the visible portion consisted of an apparently new store opening off Meetinghouse Lane. This was thrown open to the investigators by the proprietor, Mr. George Alexander. There, passing by a few steps from the level of Meetinghouse Lane, was found "a low-roofed but spacious apartment about 43 feet long by 23 feet wide, with massive walls 4 feet thick. It was further found that the roof was semi-circular, formed with interlacing ribs of moulded stone of some delicacy and beauty, with curious carvings at their intersections. It was evident that the floor was not the original one—that it must be sought at a level some 8 feet lower down—and that the apartment in its original state was some 18 feet high, and had been in modern times divided into two storeys, with a floor at the opening of the arched roof. In the eastern wall were to be seen traces of three lancet-shaped windows, which, investigation revealed, splayed inwards. An entrance from Meetinghouse Lane led into the lower portion of the building, which was divided longitudinally by a brick wall supporting heavy arching. It was evident that the rib-work of the beautiful groining sprang from wall shafts or corbels now found in the brickwork. Mr. Alexander's permission having been obtained to remove portions of the brickwork, the side and end corbels were disclosed almost as fresh as the first day, and carved in keeping with the ribs. A door on the south side in the west bay communicated with a dark and rudely vaulted passage about 10 feet wide, and running parallel with the building. This passage was evidently the slype, and served to identify the other buildings as the chapter-house of St. Mary's Abbey." Such is the account given by the investigators of one of the most curious and historic apartments in all Ireland. And with the addition of doorways at the rear of 25 and 26 Boot Lane, or, as it is now, Upper Arran Street, this dim and dust-covered apartment is now the only surviving portion of all the splendid buildings of the ancient abbey. The identification of this chapter-house gave at once the data from which the whole abbey could be conjectured. A small but beautifully carved Gothic window was discovered in the outer wall of the chapter-house, the existence of which, blocked up as it had been with subsequent overlays of bricks and mortar, was for centuries perhaps quite unsuspected. Mr. Thomas Drew, R.H.A., the architect of these investigations, assigned the date of this building to the years 1180 or 1200, a date which corresponded to the expressed opinion of Gilbert as to the date of the erection of the abbey. From a thorough knowledge of the characteristics of Cistercian architecture, and of the fact well known to antiquarians—namely, that all Cistercian abbeys were built on precisely similar plans since the eleventh century—Mr. Drew laid down on the Ordnance map of the locality a plan of a Cistercian abbey, which may be briefly set forth as follows :—Towards the south extended the fraternity or community-room of the monks, divided by pillars supporting their dormitory, with unglazed windows, which the austerity of the Cistercian rules enjoined. Across the end of Meetinghouse Lane was the kitchen, or as it was called, the calefactory ; to the west stood the refectory, on the space now known to us as "Mary's Abbey." Then came offices and stores, while at right angles to the line of the other buildings stood the "Domus Conversorum," or workroom of the lay brothers, with its dormitory overhead. This stood about the site of the Jewish Synagogue (which was by the way in former times the Bank of Ireland), and probably, says the account, extended from the front of that building back to the south wall of the abbey church, a fragment of which, with doors, sills and jambs, is still to be seen at the back of the houses in East Arran Street. The church formed the northern boundary of the cloister garth, and extended to the rear of Arran Street, through the premises which are now Messrs. Boland's bakery establishment, to a termination somewhere at the rear of Capel Street. The south transept of the church, with the sacristy, joined the chapter-house, and completed the quadrangle of the cloisters. Further excavations made in Messrs. Boland's premises confirmed this sketch. While digging in that portion where the choir, south transept and altar would have been, several small fragments of ancient tiles were found, while two built graves or small vaults were discovered, these being evidently the tombs of kings or bishops who were buried in the church at the foot of the altar. Many of the tiles are believed to date from the time of the Cistercian building. They are varied in style and character, some being incised with regular patterns, others ornamented with raised designs, letters, fleur-de-lys, &c., but all conventional in design,

while of the whole collection the best is an enamelled floor tile 1½ inches thick, found 12 feet under ground in Messrs. Boland's bakery in 1882, on which is a rude representation of the gable of a church, supposed, indeed, to be none other than the façade of the church of St. Mary's Abbey. Our account would be very incomplete did we omit to mention the scriptorium, or, as we would now say, the study or library. This room, which was larger than the chapter-room, extended both over the latter and the space over the slype. In these scriptoria the monks pursued those labours to which it has been well said "modern literature is indebted for the preservation of all we know of the classics of Greece and Rome, and even for the survival of those languages themselves." The scriptorium of St. Mary's is now a store, with nothing left to remind us of its ancient state, save perhaps the strength and thickness of the few fragments of the old walls which still remain intact, while we are told that within living memory it has been used as a theatre. We know, too, that other portions of the abbey were used as building material more than once by those into whose hands the monastic property fell. In 1676 the then Lord Mayor of Dublin, Humphrey Jervis by name, threw down a portion of the abbey in order to get building material for a bridge he was then constructing across the Liffey, and which was called Essex Bridge, after the then Viceroy, Arthur, Earl of Essex. A strange fate overtook the bridge for whose benefit the old walls of St. Mary's had been torn down. The builders of bridges do not seem to have been as perfect in their craft as the old monkish builders of monasteries, for only ten years after the erection of Essex Bridge the bridge itself collapsed completely, tumbled pell-mell into the river, carrying to a watery grave a coach and horses, which, unfortunately, happened to be traversing the bridge at the time. Within the abbey itself change and decay have long since swept away any traces of the internal ornaments or decorations of church or monastery. One object, and one only, of this nature is, so far as we know, at present in existence, and that is a life-size statue of the Virgin and Child, carved in Irish oak. Petrie, referring to this curious monument of past ages, says of it :—"The style of this is dry and Gothic, yet it has considerable merit, far too much, indeed, to allow us to suppose it a work of Irish art. We rather attribute it to some able carver of Albert Dürer's school, to whose time and style it unquestionably belongs, and we should not deem it very unlikely even to be an early work of that great master's own hand." Such was the statue, originally a distinguished ornament of St. Mary's Abbey, and not alone an object of beauty, but of deep religious veneration. In the abbey of St. Mary it stood therefore till that storm of iconoclasm which accompanied the Reformation burst over the land. One-half the statue was burnt, the other half was buried face downwards in a neighbouring innyard, where, with the hollow trunk appearing over ground, it was used as a hog-trough. Afterwards, however, it was restored to the little chapel of St. Mary's parish, which had grown up within the ruins of the monastery, where it remained many years. It may be added that an ancient silver crown adorned the Virgin's head, which crown was generally supposed to have been none other than that used in the coronation of Lambert Simnel in Christ Church Cathedral. Petrie says with regard to this :—"We incline to think this is erroneous. It was a double-arched crown, such as appears on the coins of Henry VII., and on his only—a circumstance which marked with exact precision the age of the statue which it had adorned." In the Carmelite Church, Whitefriar Street, standing on the side altar may now be seen this quaint and ancient relic of the once famous abbey. Beneath it is placed the following inscription :—"This ancient image of the Blessed Virgin with the infant Jesus in her arms formerly stood in the abbey church of St. Mary, near Capel Street, Dublin. It was mutilated and in a decayed state when purchased in the year 1824 by the Rev. John Spratt, Prior of the Calced Carmelite Convent, at whose expense it underwent a thorough repair."

We have now glanced briefly at the history of this famous abbey. There is, indeed, little more to tell. Till the year 1541 it was great, rich and prosperous. In that year it was suppressed by the statutes of Henry VIII. and his Parliament. Into the details of the suppression of this "very noble monastery," as one of its chronicles has it, we will not enter here ; suffice it to say, however, that its suppression and extinction was complete. For some years longer, Roman Catholic worship was conducted within its walls, and we read that in the year 1551 a public discussion was held in the "Great Hall of St. Mary's Abbey," under the sanction of the lord deputy, Sir James Crofts, between Staple, Bishop of Meath, and Primate Dowdal. The conference turned on the sacrifice of the Mass, and other matters arising out of the order of King Edward VI. to read the Liturgy in the mother tongue. Gradually, however, the buildings fell into decay. Yet strangely enough within the old site there was established in the reign of Charles II. the "Presbyterian Congregation of Mary's Abbey." The circumstances of the establishment of this branch of religious worship are not very easy to trace, but it appears to have been founded about 1667, and here this congregation remained till the winter of 1864, in which year they removed to a new and larger place of worship, and what was for many years the old Presbyterian church is now a bakery.

Our tale is told. Those who care for the relics of the past may even at this day, if they have any wish to visit all that is left of a great Mediæval monastery, stand within the old chapter-room of St. Mary's Abbey, and, gazing round amid the gloom and dust, see the dark walls and vaulted roof of the historic room which some historians tell us was once a king's council chamber. They may try, too, to conjure up before the eye of imagination that memorable scene, of which the author of "The Hibernian Nights' Entertainments" has given us a dramatic sketch, when, in this selfsame council chamber, the heir of the Geraldines, better known by his sobriquet of "Silken Thomas," came down to denounce the supposed treachery of the English king before that king's own council, and in the midst of peers and prelates tore off the silken robes of office (worn as the representative of his father, the then deputy), and flung the sword of state upon the council table with a violence so great that the blade started a hand's-breadth out of its scabbard. While "stripped thus of his ensigns of dignity, Lord Thomas Fitzgerald stood up, amid the wreck of his fair fortune, an armed and avowed rebel, equipped in complete mail, before the representatives of England and Ireland."

STEEL FOUNDATIONS.*

THE prairie soil underlying the city of Chicago is unfavourable to the construction of heavy foundations. The character of the strata changes materially in short distances. In general, however, there are 6 to 12 feet of loam and quicksand, then a layer of clay, which is hard and firm in some places, but in others so soft and wet that it may be readily taken out with a spade. In the business section of the city, where all the great business blocks are located, the clay, often mixed with strata of quicksand, reaches down from 40 to 80 feet to a limestone foundation. Generally a few feet down the clay grows softer and wetter. If any of it becomes solid and hard, or there are any hard-pan layers within the reach of ordinary piles, there seems to be no indication that they are uniform or at all to be relied upon. Until recently heavy foundations were commonly built of stone and concrete resting on the clay. In later years, however, this method has not given satisfactory results. The demand for all the space in the basements of great buildings has yearly grown more urgent. Either the bed of the foundations must be lowered, the foundation itself must be made thinner, or some entirely different method must be employed. The first of these alternatives has been very generally ruled out, because it has been demonstrated very clearly that the less the clay stratum is broken, the more uniform and satisfactory is the settlement of the building. Other methods have been tried repeatedly, piles have been driven, and sometimes timberwork has been combined with masonry and concrete, but the results thus obtained have also been generally unsatisfactory. As an example, the Cook County Court-house, which was built on piles, is reported to have settled over a foot and very unevenly. There are still some, however, who advocate their use. If the piles could be driven deep enough to rest upon some hard bottom, they might give us a permanent, unyielding foundation, but, judging by results so far obtained, the method is not nearly as reliable as the direct clay-bearing.

The drift of practice has been to make the foundation thinner with the use of iron, spreading out on the top of the clay without materially breaking it. At first it was only in a half-hearted way. Many old rails were used, and they were sometimes laid very unscientifically. But the practice has steadily improved. New rolled rails and heavy beams are now employed, and they are as carefully calculated for their work as any other iron in a building. This evolution has produced an entirely new type of foundations—a substitute for heavy masonry and huge blocks of concrete. Let us see how fully it has met the problem.

The site of the building now being constructed by the Women's Christian Temperance Union was previously intended for another structure, all the foundations of which were put in place some years ago. These were made of great piles of masonry, one for each column, all underlaid with a bed of concrete resting on the clay stratum about 10 feet below the street grade. This great quantity of stone so cut up the space below the street level that nothing was left available for basement use. There are now acres of buildings in the very heart of Chicago without any basement, and on this very account. In this case all the masonry has been removed, and new steel foundations have been placed on the old bed of concrete so well designed that all the basement space is available. This is the great dif-

* From a paper by Mr. Congdon T. Purdy, C.E., in the *Engineering News*.

ference between the two methods which every one first notices, and which, of course, tells most from the financial standpoint.

In the time required for building, the iron foundation has a great advantage, at least in Chicago. If rails are used the rails can be placed on the ground in two or three days, and when all the material is at hand and excavations completed, the whole foundation can be put in place in a few hours. This is oftentimes a very great advantage, and alone a sufficient consideration for the employment of this type of foundation. The cost of iron foundations varies exceedingly, depending principally upon prices of material, the ingenuity of the engineer and the familiarity of the workmen with that sort of work. In general, the cost of stone foundations will figure somewhat under that of iron, but compared with the cost of foundation per square foot of renting area, which is the proper way of doing, this difference will be eliminated.

It often occurs that heavy column loads come close to some old building or to another man's lot, so that it is impossible to spread out alike on every side. In such a case as this, the area between this and some other column can be spanned with steel beams, making a compound foundation and utilising an area that could not be used at all with masonry. Oftentimes in this way a foundation is made with two loads—one on each extreme end.

The clay loads most generally used through the business centre of Chicago vary from 1½ to 2 tons per square foot, the tendency being for the former rather than the latter. With this load the structure will settle from 3 to 5 inches, and this is usually provided for by reckoning everything that much too high at the start. Settlement comes slowly, but none the less surely. It comes in proportion to dead loads, and is dependent in some measure upon the perimeters. The whole subject presents a most interesting field for study, and one in which there is much to be learned. The judgment of practical builders who have the best opportunity for observation confirms the theory that clay areas should be proportioned to dead loads only. Where live loads are figured into clay loads for interior columns and exterior walls, the walls invariably settle the most. The reason will be found in the fact that the live load is a greater per cent. on the whole load on the columns than it is of the load on the walls. The difference in length of perimeter for wall and column foundations must also have some effect, and a similar one. In most buildings it is desirable to count a fraction of the live load in the total load on the columns, and consistency requires that whatever load is placed on a basement column should also be put on all the iron under the basement column. On this account it happens that while the area on the clay is calculated for dead load only, the beams in the foundation must sometimes be calculated for some live loads, and iron loads and clay loads must be kept separate and distinct. In general, the centre of gravity of the load should coincide with the centre of gravity of the clay area covered. In compound foundations this sometimes becomes complicated.

The concrete used is made of the best Portland cement, usually one part with four parts of crushed stone and two parts of coarse sand. Steel rails weighing 75 lb. per yard are mostly used where beams are not required. Seconds are found to answer quite as well as the first quality, and the chances are that for the length required they will be quite as good as the best, and if any flaw does exist the chances are few that it will come where the maximum bending moment occurs. In ordinary foundations they are more economical than beams. More iron is required, but the rails can be bought for about one-half what the beams cost, thus more than covering the difference in weight. It is easier to place the concrete when rails are employed, and the webs are always thick, two other good points in favour of the rail. If heavy loads must be carried with a few pieces, as is often the case in the top course immediately under the column, heavy beams are a necessity. This is also often the case where long spans are required. The sizes generally used are 10, 12, 15 and 20-inch. There is no advantage in having the iron in direct compression, and only that part projecting is strained to its usefulness as a beam. Therefore it follows that the place for beams is at the top of the pile, and that the larger the proportion of iron uncovered the greater the economy of the structure.

In designing foundations the engineer first decides on the general arrangement to be used, the sections to be generally employed, unit strains, &c., all of which is dependent in a great measure upon his judgment and experience. This done, each foundation is treated on its own merits and each course of iron is separately calculated. In putting these foundations into position, the workmen first make a plank frame the same size as the concrete bed and place it carefully into position, making the top of it, with the use of a Y level, the exact height which the top of the concrete is expected to be. After this is filled another frame is arranged for the next course, and so on to the end. The rails for each course are spaced equally. The concrete is carefully tamped between, completely embedding the iron, and as soon as one course is completed the next one can be begun. After all this is done the boxes are taken away and the whole is carefully plastered with Portland cement mortar, so that at no place is the iron exposed. It seems as if these steel foundations might be used in other places, where bed rock cannot be had to rest loads upon and where real estate is very valuable, though perhaps it would be difficult to find another place where they so perfectly fit the need as in Chicago. They are peculiarly well adapted to compound foundations where the position of loads with reference to each other is bad, and the areas which the foundations can cover are limited. This need is very liable to occur in any large building—a tower between walls, a heavy chimney stack, or a badly-arranged cluster of columns where it is almost impossible at best to distribute the loads so that they shall bear evenly upon the soil. In such places, if the load is not distributed, there will come an unequal settlement, and the bane of foundations is not that they settle, but that they settle unequally. Oftentimes in the arrangement of machinery it becomes necessary to build great pits almost adjacent to the bearing of heavy loads, and where the cutting of the masonry almost destroys the proper distribution of the load over the area expected to carry it. Here again the use of beams in conjunction with the masonry may be to the great advantage of the structure. Indeed, wherever the proper distribution of loads becomes difficult, iron may be made a valuable adjunct to the masonry.

The question of the durability of iron embedded in concrete can only be definitely answered by time itself. So far wherever iron has been taken out it has been found well preserved. Chicago architects and builders are showing their faith in it by constant use, though wiseacres still shake their heads and prophesy that some day the rail will become a streak of yielding sand.

A JAPANESE ARTIST.

THE last mail from Japan brings news of the death, at the age of eighty-three, of Shibata Zeshin, the greatest worker in Japanese lacquer that ever lived. From an account of his career given in the *Japan Mail* of Yokohama, it appears that the first of his works to attract attention was painted between 1844 and 1848. It was presented as a votive tablet to the shrine of Inari, in Oji, a village in the suburbs of Tokio, where it still hangs. Shortly afterwards it was seen by a member of the great Matsudaira family, who offered a large sum for it, but the priests did not consider they would be justified in parting with it. Zeshin, as he was generally called, commenced his artistic career at the age of eighteen or nineteen as a painter of fans, and even while pursuing this humble calling his work was of such excellence that the sons of artistic families became his pupils, and many of them gained high reputations afterwards. It is said of Zeshin that when his pupils complained of business being slack he told them they ought to congratulate themselves, for it was only when the pressure of everyday employment was removed that men could undertake works calculated to establish their reputation. He worked up to five days before his death, and was engaged upon a decorative picture painted on silk of the Japanese Elysian fields, which was almost completed. Examples of his great works in lacquer decoration have been exhibited in Europe, and have given him a position amongst the greatest industrial artists of his country. It is curious to note that the four greatest artists of modern Japan have died within the last four years.

THE ULPHIC OLIPHANTE IN YORK MINSTER.

AMONG the abounding antiquities of the city of York the treasured object known as the Horn of Ulphus might be cited, says Mr. Oliver, as one of the most conspicuous, and one which was prolific of interest to visitors to the cathedral, both from the circumstances in which it came into the possession of the Chapter, and because of its extrinsic value as a relic of a custom of the tenure of land, which was probably of the highest antiquity. The drinking-horn proper, made from the horn of the wild ox, of which the "olifant" was most associated with luxury, was confined, said Pliny, to the barbarous nations of the North, and the statement was confirmed by what they knew of its use by the Scandinavian, High German, and Saxon branches of the Teutonic race, and its discovery in the sepulchral tumuli of the Anglo-Saxons. The story of the Ulphic horn was as follows:—Ulphus, the son of Thorold, was an influential thegn that was "servant" of the king, of Danish origin. He ruled as consul with the title of earl over the western part of Deira, a division of the kingdom of Northumberland, bounded on the north by the Tyne and on the south by the Humber. That prince, of whom little or nothing else was known, was, however, not without honour in his father Thorald's adopted country for the dignity of "Eorle" which he enjoyed, and it was at that time that the Danish title of earl was first generally used, and

was of the same rank as that of archbishop. To confirm the investiture, Ulphus gave to the church as a pledge of his good faith an important and valuable personal requisite in the form of his own drinking-horn of carved ivory, from which he previously drank wine upon his knees before the altar. The olifant, when thus presented, was carved with verrols of gold, and had a gold chain for suspension. It was, however, stripped of that embellishment by a goldsmith to whom it was sold in the reign of Edward VI., and it afterwards came into the possession of the Fairfax family, by whom, in the person of Henry Lord Fairfax, it was returned to the cathedral.

ROMAN REMAINS IN CHESTER.

THE party who are engaged exploring Chester city walls in search of Roman remains have discovered a stone to the memory of a veteran Roman soldier, who appears to have put in his full time of service; and another inscription, so far as can be deciphered, refers to the death of a soldier of the 2nd Legion of the Roman army of occupation. The latter possesses peculiar historic interest, inasmuch as the general belief hitherto has been that it was the 20th Legion which occupied the city. The inscription on one of the memorial-stones found in the earlier part of the week is—

D. M.
CVRATIA. DINY
SIA. VIX. AN. XXXX
H.F.C.

Some archæological experts have translated this, "To the divine shades, Curatia, who lived forty years. Her heir erected this to her memory." Above the inscription is a very perfect piece of sculpture showing a recumbent figure on a couch, with a tripod table near. Two doves stand on wreaths in the alcove, and in the ornamental border there are water nymphs trumpeting. The nymphs are curiously composed, each having a human head and body, four horses' legs and a fish-tail. The figure, believed to be that of a woman, holds a scroll in its hand.

THE OLD MANOR-HOUSE, ASTON BURY.

THE old manor-house known as Aston Bury is about three-quarters of a mile south-east of the church and village, which are near the road to London passing through Hatfield, and was probably built by one of the Botelers about the middle of the sixteenth century, but which one is uncertain. The plan on the north side forms a straight line, but on the south is broken by two projections, which are filled with remarkably bold but fine staircases with Renaissance details; they are both much of the same design, but the one in the eastern wing is the richer. Leading to it on the ground-floor out of the old hall is the principal doorway, with a Tudor-headed arch, in the spandrels of which are carved two shields of arms, which help to give a date to the building; on the east side are the arms of the Botelers. Sir Philip Boteler, of Woodhall, married Elizabeth, daughter of Sir Robert Drury, knight, of Halstead, Suffolk; he acquired the estates in 1540, and died on March 28, 1545, and it was in all probability by him that Aston Bury was erected. Most of the rooms, as was usual at this time of domestic planning, are thoroughfare rooms. The most peculiar feature in the house is the long-room, which is reached by the eastern staircase; it runs the whole length of the building on the north side, it is 110 feet long internally, 17 feet 6 inches wide, and 8 feet 4 inches from floor to top of the moulded wall-plate cornice. The roof is waggon-shaped and ceiled. It is lighted by a large square-headed window at east and west ends, and by four smaller ones on north side in the gables; there are eleven small cupboards formed in the roof, which seem to have been originally all boarded. It was entered by two large doorways in the south side, and warmed by two open fireplaces in south wall. It is the opinion among some of the inhabitants that Aston Bury was once a nunnery, and this room was their living apartment, and that the eleven small cupboards was where they slept. It is much more probable that the room was intended for a ballroom. Several stone coffins have been found at different times near the house. There was formerly a chapel at the east end of the building, the foundations of which were removed not many years ago. The building externally is most picturesque, especially the north front, the monotony being broken by the four moulded brick gables and string-course. The moulded brick chimney-stacks here are most beautiful in detail, most of them varying in design.

There is a picture in the British Museum of Aston Bury drawn about the year 1805. In this drawing the porch is placed in the exact centre of the house, and is of brick, the top of the porch corresponding with the gables of the house. The present front door was formerly a window, and no doubt was altered when the house was turned into a farmhouse, for the porch is of wood, and perhaps made of part of the oak screen which used to run across the old hall. In the beams and floors of the new kitchen, formerly the old hall, are marks of where the screen was attached to the old beams.

THE LATE WILLIAM THEED.

THE death is announced of Mr. William Theed, the well-known sculptor. He had attained the age of eighty-seven, having been born in 1804. His father was also a sculptor. Young Theed received his general education at Ealing, and for some years was a pupil of E. H. Baily, R.A. At the age of twenty-two he began a course of study at Rome under Thorwaldsen, John Gibson, Wyatt and Tenerani. Notwithstanding an ardent devotion to his profession, he did not acquire a high reputation until 1844. In that year the Prince Consort requested Gibson to send him designs by English artists in Rome for ten marble statues to be placed at Osborne. Theed took part in the competition with *Narcissus at the Fountain* and *Psyche lamenting the loss of Cupid*, both of which were adopted. To the same period belong his *Ruth Gleaning*, *The Prodigal's Return* and *Rebecca at the Well*. In 1848 he returned to London, where his work had already begun to attract attention. On the death of the Prince Consort, Mr. Theed was asked by the Queen to execute a life-sized group of herself and His Royal Highness in Early English dress, *The Parting*. After this, as may be supposed, he had no reason to complain of a deficiency of commissions. His most important achievements were the statues of the *Prince Consort* for Coburg and Balmoral, *Musidora* for Marlborough House, *Sir Isaac Newton* for Grantham, *The Duchess of Kent* for Frogmore, *Henry Hallam* for St. Paul's Cathedral, *The late Lord Derby* for Liverpool and *Sir Robert Peel* for Huddersfield. He also designed the twelve bronze alto-reliefs from English history in the Prince's Chamber, House of Lords, and the colossal group representing Africa on the Albert Memorial in Hyde Park.

RICHARD MOON SCHOLARSHIPS.

THE conditions of the scholarships instituted by Sir Richard Moon, Bart., late chairman of the London and North-Western Railway Company, to mark his connection with that company, have been issued in connection with the educational prize scheme of the Mechanics' Institute, Crew. The market value of the debenture stock which Sir Richard has transferred to the Council of University College is about 2,600*l.*, and in accordance with the terms of the trust the proceeds of the fund are to be used for scholarships, exhibitions or prizes to be awarded to young men employed in the London and North-Western Railway Company's works at Crewe, Wolverton and Earlstown, who are desirous of pursuing the study and practice of engineering. The fund will be known as the Richard Moon Scholarship Fund, and for the present will be applied to the creation of two scholarships, each of the value of 40*l.* a year, and tenable for two years. One scholarship will be offered for competition in the course of the summer term of each session. Candidates for these scholarships must not be less than sixteen and not more than twenty-three years of age on the day appointed for the commencement of the examination. Every candidate must have been employed at one of the approved works of the London and North-Western Railway for at least twelve calendar months continuously before the date of commencement of the examination. Candidates will be examined in mathematics, physics and engineering. Every Richard Moon scholar will be required to employ himself wholly in the prosecution of his studies at University College, Liverpool, or with the approval of the college senate in some manufacturing workshop or institution in such a way as will conduce to his advancement in the science or practice of engineering.

Correspondence

Increase of Lunacy and Costly Asylums.

SIR,—It appears from the most recent returns that during the year 1890 the percentage of lunatics discharged as cured was 38·59, and less than the rate for the previous year, therefore the main purpose of asylums for the insane continues to be the permanent safe custody and treatment of the incurable. During the past thirty years the number of registered lunatics has nearly doubled in proportion to the population, the increase being partly attributable to the withdrawal of patients from

workhouses, the inclusion of persons who would not have been formally regarded as insane a few years ago, and to causes of a kindred nature. It must therefore be noted that, as a greater proportion of cases are less acute than in years past, statistics as to cures cannot be advanced in support of great advantages derived from modern systems of custody and treatment. The importance of reducing the cost per bed in the erection of the asylums will not be over-estimated, if it be remembered that for the county of London alone additional asylums for more than 2,000 patients must be provided every five years to keep pace with the continual increase of the insane; therefore, with regard to this county particularly, it is most desirable that there should be a careful consideration and comparison of new asylums, and of the cost of working these as well upon old as upon new and untried methods, prior to the erection of others upon similar models.

The total cost of land, buildings and fittings, as well as the cost of maintenance, during a sufficient term of trial should be accurately ascertained, and the results made more public than hitherto. New systems of heating, ventilation, lighting and other matters, should be tested as well with regard to their suitability for small as for large institutions. The proportion of cures to the whole number of patients should be ascertained with, if possible, greater exactitude, that none, partly cured, return to propagate their calamity to future generations; but it is to be feared that for the sake of a comparatively small percentage of curable cases, that a very large proportion of known incurable, insane paupers are housed at an outlay, *per patient*, that would provide a very comfortable residence for a well-to-do working-man and his family. In *The Hospital* for September 5, a writer (referring to an assertion in a previous issue) asks, "If an asylum can be built for 130*l.* per bed, I, as a London ratepayer, would like to ask why the Council is expending upon its new asylum at Claybury 200*l.* per bed? I understand this asylum is to contain 2,000 beds, and that more than 400,000*l.* is being laid out."

Probably more has been done, and is being attempted, for the housing and treatment of pauper lunatics of the incurable class than the community can afford, having due regard to its numerous other responsibilities; enormous sums have been, and are being, expended upon asylum buildings, but with regard to cost probably no scheme of modern times has been more disappointing than that for the Claybury Asylum, for which the original estimate was 290,000*l.*, or 143*l.* per bed, but which is more likely to cost nearly twice as much, although (to quote a published description of the work) "the original design is, in respect of its general arrangement and accommodation, almost identical" with the works as carried out, but the question has elsewhere been raised as to why it should be necessary to expend so much upon this asylum, and so very much less per patient at the asylum, near Dorchester, which is in the same architect's hands.

There have been recently distributed amongst those interested in the promotion of the building of asylums copies of a paper upon the subject. The writer, an architect, states as follows:—"A word in passing about competitions, which are unfortunately gaining ground. I say unfortunately, because they are not always calculated to produce the best results." Now I am strongly of opinion that it would be a subject for regret if asylum-planning should be limited to the few, and the fair competition of architects upon such works discouraged, for the community are greatly in need of all the ability and invention that modern architects can bring to bear upon the subject, and there are not only a number of architects who have really a large experience of such undertakings, but also many architects' assistants who, having been specially trained in asylum works, are awaiting their chance for a commission.

One of the costly items of asylum construction is the system of heating and ventilation; in very large buildings an enormous extent of expensive excavations for underground air passages is provided for. This I consider to be very undesirable, first, upon the ground of expense, and again by reason of loss of power and heat (by absorption, friction and other causes *en route*), especially when mechanical means are adopted to drive heated air in directions opposite to its natural course. This loss must often be serious and involve an increased outlay to maintain heat and a supply of fresh air, particularly when (upon a large scale) the attempt is made to supply an adequate amount of warmed air from the ceiling levels; apart from this these underground passages are receptacles for dust, are dark, and there is the chance of extracting here and there foul air from stagnant corners out of sight, for in very large buildings it would appear to be impossible, even after the finest supervision of the works during progress, to avoid this risk.

Asylums have been erected within the last few years not only at a cost of 130*l.* per patient, but for very much less, and in my opinion it is improbable that this figure will in future years be very much exceeded, for statistics already show that a greater expenditure is undesirable and uncalled for.—Yours faithfully,

"SUUM CUIQUE."

September 15, 1891.

The Collapse of a New York Building.

SIR,—I enclose you a cutting from one of the New York papers, which might be considered worthy of a corner in your paper:—

The Building Inspector's Plea.

You'd scarce expect one of my kind
A great big building's faults to find,
For I'm not only an inspector—
I am a worker and elector!

'Tis true I have the use of eyes
And that I ought to supervise
The use of buildings, too; but then
I am no worse than other men!

I see about me day by day
Officials who still draw their pay
Because their names are on the list,
And who I'm sure would not be missed!

How should I know how girders lie
And tenants pile dead weight on high?
People who gird at me should try
If there's no beam in their own eye!

I can't see through brick walls, and so,
As strolling down the street I go,
I take for granted things are right
Mainly because they're "out of sight."

The inspector is not the only person who deserves blame. More responsibility attaches to some of the owners and tenants, for the architect of the fallen building in Park Place declares that the structure was designed as an office building. That being so, why did the owners lease any of it for manufacturing work which required heavy machinery, like steam printing-presses, and why did the lessees select it? Both parties knew that the building had no interior walls to stand the strain which great masses of machinery and material imposed.—Yours obediently,

C. P. S.

GENERAL.

An Exhibition of the products of Ancient and Modern Cyprus will be held next year in London. It is to comprise art and antiquities as well as industrial products.

The Comte de Paris has presented to a Canadian church a relief in silver representing St. Louis offering his sceptre to St. Anne. It was specially produced in Paris.

The Local Government Board have sanctioned a loan of 14,000*l.* for the erection of public baths in Coventry, and a loan of 1,375*l.*, the purchase money of property in Earl Street required for the site of the proposed new municipal buildings.

Sir Augustus Harris has again adopted Wenham lamps for lighting Covent Garden Theatre during the present Promenade Concerts season.

Mr. George Reed, the new president of the Royal Scottish Academy, has prepared designs for the decoration of Craigiebucklar Church, which will be carried out under his direction and at his expense.

Mr. Colin Rae Brown has presented to the Mitchell Library, Glasgow, the early records, scroll minute-book and letter-book in connection with the National Wallace Monument enterprise which he organised in Glasgow thirty-five years ago.

St. Peter's Church, Vere Street, W., has been reopened, after having been closed for a short time, to allow of a new scheme of ventilation being adopted, and the work has been successfully carried out by the "Climax" Ventilating Co., of 15 Great George Street, Westminster.

The Goole Market Hall Company, says the *Leeds Mercury*, have declined the offer of 4,000*l.* made by the Goole Local Board for the site upon which the late Market Hall (destroyed by fire) was erected. They have expressed their willingness, however, to accept 4,500*l.*

The Primitive Methodists of Bradford have resolved to pull down Mansfield Road Chapel, built in 1824, and build a central hall. The ground-floor will consist of shops, with a large vestibule and staircase; above will be the principal hall, constructed in the form of the Mechanics' Institute in the town, with sitting accommodation for 600. The entire outlay will be 3,000*l.*

The New Schools, Kingston, S.W., are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

We have just received an advance copy of the twelfth edition of "Successful Advertising." The book has a very useful list of newspapers and gives many hints on success in advertising. It is published at 2*s.* by Messrs. Smith & Osborne, of 132 Fleet Street, E.C.

A School of Fan-painting will be opened next month under the patronage of the Company of Fanmakers.

The Architect.

THE WEEK.

ONLY thirteen sets of drawings have been received in the competition for the Cork Court-house. Each set consists of nine drawings, viz. :—A plan of the basement showing the cells for prisoners, and the method of heating the building ; a plan of the principal floor showing the arrangement of offices and seats in court ; a plan of the first floor and offices, four elevations (viz. to Great George's Street, Cross Street, Court-house Street and Liberty Street), a cross section and a longitudinal section. All these are on a scale of 8 feet to an inch. A descriptive report with detailed estimate accompanies each set, showing how the probable cost is made out. The conditions have fixed the cost of the work at a maximum, 20,000*l.*, but the committee have intimated that they expected it to be done within 15,000*l.* The portico and façade from Cross Street to Court-house Street, which were little injured in the fire, are to be retained. The remaining exterior parts are subject to such alterations as may be found necessary to meet the altered arrangement of the interior. It is expected that the competitors will not only produce a design for a more comfortable edifice than the old one, but will be able also to make provision for considerable additions to the accommodation of judges, jurors, officials and the public, having regard to the extended jurisdictions and functions of the local tribunals and officers. Mr. THOMAS DREW, R.H.A., is the assessor who will aid the Corporation Committee and the Court-house Commissioners in the selection of the plans. The premiums are 100*l.*, 60*l.* and 40*l.* Unfortunately the awards are subject to the approval of the Municipal Council of Cork, and no doubt it was apprehension of the consequences of dealing with so uncertain a body which prevented a greater number of architects from taking part in the competition.

THE arrangements for the competitions in connection with the Dundee Institute of Architects have been completed. Prizes are offered for the best architectural sketch, any subject or part of a subject ; the best architectural measured drawing or drawings, containing plan, elevation and section to $\frac{1}{8}$-inch scale ; the best etching on metal of any subject of an architectural character ; the best series of not fewer than four photographs of any architectural or engineering subjects ; the best modelled or carved original design of an architectural or decorative subject in any material ; the best sketch in any medium from an antique subject in the Dundee Art Museum of casts ; the best architectural or engineering drawing. The candidates must belong to Forfar, Perth or Fife. The works are to be sent in on or before May 1, 1892. For the ensuing session the committee have been able to arrange with lecturers of ability, and it is evident the institute becomes more attractive to the members as it grows older.

THE district surveyors are anticipating a busy season through the provisions of the London Sky-signs Act. By that measure it is enacted that any person having any "word, letter, model, sign, device or representation in the nature of an advertisement, announcement, or direction," "supported on or attached to any post, pole, standard, framework or other support, wholly or in part, over any house, building or structure which, or any part of which, shall be visible against the sky from any point in any street or public way, with the exception of any flagstaff or pole or any vane or weathercock not adapted or used for advertisement," and with the exception of "any sign which is securely fixed to or against, but not over, any building, or which rests immediately upon the top of any wall or building," shall be compelled to remove such sign under heavy penalties, unless, on or before October 3, 1891, he applies in writing to the district surveyor for a survey and inspection of such sign and a certificate of its safety. The surveyor cannot grant a certificate unless the application be made to him within three months after the passing of the Act, and no sign can be allowed to remain without such certificate has been obtained. A district surveyor, who writes to the *Times* on the subject, affirms that all signboards of public-houses and other places of business which rest upon a cornice in front of a parapet or blocking course will fall within this category, as they do not rest immediately upon the top of any wall or building, the top of the building being the highest part of the roof, and the cornice being a projection from the wall. It will be the duty of the district surveyor to report to the Council from time to time all such signs existing in his district. The County Council will be bound to prosecute any offender against the Act, and no cautionary notice is due to any one. It was understood that the Bill, when introduced, was directed solely against sky-signs and any other class of announcement that was not according to established precedents. But apparently the enactment is more comprehensive, and it is destined to give many an unpleasant surprise to London shopkeepers before the year is over.

THE members of the Surrey Archæological Society will have an afternoon excursion to Ham House, Petersham, on Saturday, October 3. Lord DYSART has given permission for an examination of the house, which was built early in the seventeenth century. Practically it remains unchanged, and is filled with art treasures. Mr. S. W. KERSHAW, F.S.A., has prepared a paper on the history of the house, which will be read at 3 P.M. punctually, after which the party will walk through the principal rooms and inspect the pictures, &c. Ham House is about 1½ miles from Richmond Station.

THE project for the proposed cathedral of St. John the Divine is not to rest in abeyance, although the long excitement of the competition is over. According to *Architecture and Building*, the trustees will, before the end of the present autumn, inform the architects, Messrs. HEINS & LA FARGE, as to what modifications are desired, so that during the year 1892 the corner-stone may be laid. As soon as the arrangements with the architects have been completed, copies of the cathedral designs will be made and used, in connection with other methods, for the purpose of obtaining subscriptions, it not having been thought wise to make any attempt in this direction until the trustees should be able to inform the public definitely as to the plans of the cathedral. The gifts thus far made—either actually received or legacies soon to be paid—have been made without solicitation, and amount substantially to about enough to pay for the site, that is, 850,000 dols. In Great Britain churches have been commenced under similar circumstances; but, from the prominence of the new building, it will not answer to have the works suspended after they are once commenced.

THE exhibition which will be held in Boston during the convention of the American Institute of Architects in October will include all kinds of architectural drawings, sketches, plans, details, decorations, drawings of furniture, interiors, &c., as well as photographs of executed work, though it is stated to be quite desirable that the photographs should be accompanied by sketch plans as far as possible. As the exhibition will appeal primarily to the architects as a professional body, the committee hope that the contributions will by preference be largely such as will illustrate the actual office work and study of the architect, not, however, to the exclusion of purely artistic rendering or picturesque sketches. In order to be properly exhibited all contributions should be framed or mounted on stretchers. No exhibition blanks are necessary, but each drawing should bear the name and address of the exhibitor on the back. When the draughtsman and the exhibitor are not the same, it is desirable that the draughtsman's name should appear on the front of the drawing. The committee have arranged with firms in various cities of the United States to act as agents, and receive, pack, forward and return in proper order all contributions for the exhibition, without expense to contributors. An illustrated catalogue of the exhibition will be published. The expenses will be shared by the Boston Society of Architects and the Boston Architectural Club.

FRENCH VIEWS OF ENGLISH GOTHIC.*

THE article on "Gothique Anglaise," by M. PLANAT, indicates none of that feeling of self-satisfied superiority which too often inspires foreigners whenever they attempt to treat English work. We have already, when referring to his articles on Mediæval building in France, explained M. PLANAT'S point of view. As an authority on all problems in construction, he always renders full justice to any example of skilful contrivance which was produced by one of the Goths, and he is not indifferent to the impressive effects which are due to the beauty of many French churches and cathedrals. But he is not captivated by the style. As becomes a French writer, he follows the great classic authors of his country, and, with a few exceptions, they were never enamoured by anything that was Mediæval. The features which give character to the style were considered to be so many "colifichets" or trumpery trifles, and were utilised by professors of rhetoric as manifest warnings of the depths to which imagination can fall when allured by bad taste. You have only to change the names, said FENELON, and substitute poets and orators for architects, in order to see the consequences of departure from imitation of right models.

The literary influence of CHATEAUBRIAND and HUGO, aided by the more disciplined skill of MÉRIMÉE and VITET, created an interest in Mediæval work in France as well as a new Government department to look after the remains. There can be no doubt that they were able to gain support by pointing to England. Most Frenchmen are puzzled when they see so many Mediæval buildings in England well preserved, especially when they discover that Government is not directly concerned in the conservation. M. VITET drew a comparison between the fate of two Benedictine monasteries in England and France, in order to demonstrate how, in spite of reformations and revolutions, such buildings were respected in England, while in France the inmates did not wait for political convulsions to change the character of an ancient building. He went so far as to say that the celebrity of the English cathedrals, which assuredly was greater than that of the French buildings, was due to their marvellous preservation. On that account M. VITET implored his countrymen to lose no time in saving their architectural monuments from ruin. But he was too true a Frenchman not to believe that, in spite of their ruined condition, the French buildings were more valuable as works of art. All the English buildings of any period seemed to him to be cast in the same mould, whilst in France there were, he said, peculiarities of style in Alsace, Saintonge, Auvergne, Poitou, Languedoc and Rousillon. In fact, M. VITET saw a relation between the people of England and their ancient architecture; both were polished, varnished, shining with propriety and good keeping. As happened in other cases, M. VITET made use of English work to serve his own ends; but, however useful it might be, he was not entirely free from contempt for it in his judgments.

If a gentleman who was a genuine archæologist, and possessed an official interest in all things Mediæval, could allow himself to be led away by the national vanity, many allowances should be made for those who have a professional interest in a different style whenever they discuss the character of English Gothic. M. PLANAT does not need them. Naturally he admires Norman work, and some examples of the Transition. In Malmesbury he sees either the employment in a coarse way of elements which elsewhere were used with more elegance, or the first attempts of precursors who were in advance of their rivals on the Continent. The question is not to be solved in the absence of documentary evidence, but M. PLANAT does at least hold that the Malmesbury arches, however imperfect, may have been a lucky hit by some English worthy. Canterbury is associated with the name of WILLIAM of Sens, whose disciple was WILLIAM the Englishman. Some French scholars have concluded from the circumstance that Gothic must have been an importation into England from the Ile-de-France. M. PLANAT is opposed to that theory. He compares plans of the cathedrals of Canterbury and Sens, and while admitting some analogy between the "ronds-points" of the two, he says there is undoubtedly no resemblance between them in the greater part of the work. The strange trapezoidal form of the choir has no prototype at Sens. M. PLANAT'S theory of the part taken by French and Norman architects is reasonable. There is no doubt the Normans introduced Romanesque with their own modifications into England, and probably the architects and builders formed the party in advance; but here, no less than in Normandy, the evolution of the style went on. If in France some new feature was employed—and the domain royal has been credited with the invention of them—it was likely to be emulated by the Normans wherever they were to be found. When the great work of reconstruction at Canterbury was proclaimed in the twelfth century, general interest would be excited, and the aid of artists from all parts could be anticipated. The Gatehouse at Norwich, known as St. Ethelbert's, is one of the buildings which delight M. PLANAT. He says it is "un bijou d'art Gothique," and the introduction of flintwork is particularly happy. But the upper part, where the flint appears, is of later date than the remainder of the work. In Salisbury, with the purest details there is much—the arrangement of the windows being one feature—which is not to be found in Continental churches, and the plan is also English. Peterborough must too be considered as only remotely related to any French cathedral.

M. PLANAT selects characteristic types of various periods, and his countrymen must admit, on seeing the illustrations, that the Mediæval buildings of England are not copied with fidelity from French buildings. We cannot expect M. PLANAT to declare that the English buildings are the more impressive or the details more refined than those produced by French masons. It is enough to have it admitted that in England there was competence to treat the Gothic styles in ways that were not always irrational. M. PLANAT points out many features that appear to be excellent, and his interest in construction attracts him to arrangements in vaulting which are not to be seen in France.

His mode of treatment as well as his conclusions differ from those of M. VITET'S. In one case construction is taken as a guide, in the other what passes for history. M. VITET, although a Mediævalist, was, like the professors of literature, a believer in a standard or type that was to be accepted universally. English architecture was at first, he said, conformable to the universal type, "Type suprême et canonique." By degrees it lost fidelity, then became independent, and finally the land was overspread with a darkness in which all art was obscured. Under the Normans, he tells us, not only architects and workmen were imported, but stones ready dressed. Invaders carried, as it were, their cathedrals all built, just as in a subsequent age LE NOTRE planted forest trees on the terraces of Marly. In France the Romanesque style was not superseded without a long struggle; but the English, being imitators, seized on the "premier style Gothique" in its complete form. They carried it out successfully with one exception, viz. the substitution of right lines for curved in the chancels. One asks in vain, says M. VITET, by what reason the English were led to this schism. The change was not made necessary by any difference in the rites or canonical prescription, and it has not produced finer perspectives than the apsed end. M. VITET admits, however, that some of the English cathedrals have a noble expression, and Salisbury he considers to be magnificent. The fairies of the Alhambra have not, he says, surpassed the delicate groining that is seen in the chapter-house of Salisbury, and there is nothing like it in France. He admits that in vaulting the English were the foremost masters, and to the accomplishment of that class of work their imagination and studies were directed.

In the thirteenth century variations were introduced, and they became more marked in the fourteenth century. The difference between the French and English methods can be judged, says M. VITET, by comparing St. Ouen, Rouen, with the choir of York Cathedral. There is a wide difference in the detail, and as time went on French and English Gothic separated more and more until at last they

* *Encyclopédie de l'Architecture et de la Construction.* Directeur P. Planat. Vol. V. Paris: Dujardin et Cie.

Etudes sur l'Histoire de l'Art. Par L. Vitet, de l'Académie Française. Deuxième Série. Moyen-Age. Paris: Lévy Frères.

seemed to be antipathetic. The relationship between the two nations was ignored; each sought after its own civilisation and poetry, and consequently each must have its own architecture. The loss to England by estrangement from France was seen in the Perpendicular style, in which, according to M. VITET, the mullions of the windows suggest the bars of a prison, while the introduction of transoms, by interrupting the ascending lines, shows an indifference to the true spirit of the style which the French and Germans respected up to the sixteenth century. Subsequently features were taken from Italian buildings and mixed with Gothic, as if unity of style was beyond recognition. It is only by means of borrowing and importations that English art has survived, and if ever the country should possess a special style, it will be owing to whims of an aristocracy that is rich and proud of a half barbarous civilisation.

Many more specimens could be given of M. VITET's method of philosophical inquiry, but our readers have no doubt more than enough already. His essay, which was much appreciated at first in France, is worth comparing with M. PLANAT's, not merely for the purpose of showing how differently a subject can appear to two writers, each of them being well informed, but rather for exhibiting two processes of conducting an inquiry. There is no doubt that the superiority lies with the more modern one.

PATENT OFFICE MISMANAGEMENT.

IN his remarks upon a paper read by Mr. L. EDMUNDS at the meeting of the British Association on the subject of the "Taxation of Inventors," Sir FREDERICK BRAMWELL certainly acted in a way that was worthy of his varied experience when he criticised the administration of the Patent Office, and pointed out that the specifications sold to the public are a disgrace to the staff. There is certainly reason for more liberal expenditure in the Patent Office, and more especially is it needful that some of the surplus accruing to that office should be devoted to proper administration. To cut down the fees, as some people have advocated, would be absurd. If a mechanic has an invention which is worth anything he can surely find 1*l.* to protect it for nine months. The procedure to be gone through is simple enough. Forms are obtainable without cost, and for sixpence anyone can buy a book of instructions which will give some information about the preparation of drawings and other details. An inventor need not necessarily put himself into the hands of a patent agent, for even if his spelling is defective his specification will be printed by Her Majesty's printers. There seems to be no regard of orthography in such documents, and hence we have seen the word "horizontal" spelt in three different ways in two lines. There is not apparently anything in the Patent Acts to necessitate the perpetuation of bad spelling in the specifications issued to the public, nor can the practice be influential in promoting beneficial inventions.

The surplus revenue of the Patent Office should be applied in the first place to the guidance of inventors. A man should not be permitted to waste his time and money on impossibilities. Government should protect him. But for that purpose it would be requisite to have examiners who were possessed of technical knowledge. Why cannot the authorities of the Board of Trade employ even one official possessed of common sense and mechanical skill? We who live in the birthplace of engineering ought not to be obliged to turn to America to be taught how to distinguish a possibility from an impossibility, either mechanical or physical. The authorities of the American Patent Office will not grant a patent for a perpetual motion machine until they receive a working model which fulfils the predicature of the specification, a model which never arrives. In that way the mistaken inventor is saved from wasting his money and his life on a dream. There are many schemes as chimeric as perpetual motion. Quite recently the old idea of pumping back steam which has done its work in the cylinder into the boiler has been revived and a patent granted for it in England. To multiply instances of patents for useless and impracticable things would involve, however, the filling of volumes. If any competent engineer will step into the Patent Office library and take a volume at chance he will soon become weary of the waste of paper upon notions that are only imaginative.

Beside acts of omission, there are others in which injury is done not only to inventors but to the country through the misappropriation of the revenue of the Patent Office, and that is in the payment for certain outdoor work. The late Mr. BENNETT WOODCROFT conceived the excellent idea of abridging the specifications, and so saving consulting engineers the trouble of wading through all the indexes and separate specifications. When it is considered that they cover the ground from 1637 to 1866, these abridgments were excellent. But what will the new set of abridgments be? When as many as 22,000 patents are granted in one year, it is evident that an abridgment of each class should be made under the conduct of a man or of men who have a practical knowledge of the subject-matter submitted for condensation. Under the present mode of dealing such a course is not followed. Specifications referring to husbandry have been sent to a professor of metallurgy, intricate envelope machinery to a lady, and miscellaneous engineering work to a music-hall artist. We have before us a record of the draft abridgments of nearly 1,000 specifications farmed out to a man who did not understand the questions involved, which comprised boilers, furnaces of all kinds and electrical apparatus. The Board of Trade pays five shillings per specification to the elect of the Patent Office examiners, and those who do the work receive from two shillings to two shillings and sixpence per specification. When such evidence is available, it seems time that the abuses should be taken in hand and an inquiry made by some independent authority.

LOAN COLLECTIONS.

THE following communication from the pen of Sir J. C. Robinson appeared in the *Times* of Tuesday:—

This subject has been brought into notice by a recent endeavour in the House of Commons to make the authorities of the National Gallery follow the example of the South Kensington Museum, in regard to the system of circulating works of art on loan, and it is notified that the matter will be again brought forward in the next session of Parliament. It is therefore ripe for discussion. Art matters, however, seldom receive adequate consideration in the House of Commons, and there is, I think, no place so suitable for entering upon it as your columns.

The question is a many-sided one, and is sure to give rise to much difference of opinion; it touches not only the National Gallery, but all our public museums, nor is it likely to be confined in its incidence to art and antiquarian museums. Our scientific collections will in the long run most probably have to conform more or less, according to their nature, to whatever *régime* is imposed upon the other institutions. My concern, however, is with art specialties alone; it will be for the scientists to take up the question for or against this *régime* when it touches them.

My justification for entering upon this matter will, I trust, be thought sufficient; it is that I have had a very long practical experience of the loan system, and that I am still officially occupied in carrying it out. Upwards of thirty years ago the first origination and organisation of the system at South Kensington, which has since attained such far-reaching extension, devolved upon me, and for nearly ten years past, as Her Majesty's surveyor of pictures, one of my principal duties has been to advise as to the loan of pictures and other works of art from the Crown collections, a practice which has been of very rapid growth and threatens in the near future to involve very difficult problems. That I am on the whole an advocate rather than an opponent of the loan system I desire to state in the outset, but I am far from being a fanatical partisan, and I am anything but an upholder of the *régime* as now carried out at South Kensington. The practice there has far outrun the original arrangements, and although it has doubtless effected much good and must in some shape or other be continued, I think that the time has arrived for regulating and in some respects restraining and abridging its action. This being so, if it were seriously the question of bringing the National Gallery or the British Museum under any such unmeasured *régime*, it would have no more thorough opponent than myself.

There are two main conditions touching this loan question which should be steadily kept in view and inflexibly upheld. The first is the absolute necessity for the preservation of unique and precious works of art from accident or deterioration. Consequently, in the great majority of instances, such works, in their nature, should not be moved about from place to place.

The second is that, as works of art cannot be in two places at once, all such works of great or paramount importance should have fixed and permanent abiding-places where they can always be found and referred to and not a fluctuating *status* rendering them liable to be not at home when they are most wanted. This amounts to the *dictum* that the precious treasures of our great metropolitan museums should be immovable, preserved with the most jealous care and attention, and not fatigued by secular use and ultimately worn out. Obviously such great establishments cannot be brought to every man's door; Mahomet must go to the mountain, for the mountain cannot be brought to Mahomet, be he ever so clamorous or powerful.

What then is there to be done? Does this mean that our great metropolitan museums are to remain central storehouses only, taking no part in the extension of art culture beyond their own walls? To this I answer, certainly not, but that on the contrary there is, consistently with the conditions I have indicated, a practically boundless field of operations before them.

Of provincial museums and special exhibitions the name is now legion, and every day sees fresh growths, not only in every part of the United Kingdom, but in our colonial centres as well. The promoters and managers of these institutions are clamorous for State assistance; if it were desirable, it is now too late to retrace steps which have already been taken. The loan movement then must go on, more especially since it is obvious that direct pecuniary assistance cannot be given by the Imperial Government to provincial museums and galleries.

Of course, whatever the State does should be well done; it is altogether inadmissible that any art but the highest and most genuine should be countenanced or promoted by authority. It would be neither possible nor desirable to endow an indefinite number of widely-distributed local centres with great original masterpieces of art. Such works, especially of former periods, are limited in number and of ever-increasing costliness; and for obvious reasons it is far better that they should be aggregated in a very few European centres than frittered away and planted far apart. There is, indeed, a European solidarity of interest in this matter. It would, in fact, be better for the majority of Englishmen even that, for instance, such a masterpiece as the great Holbein just acquired for the National Gallery, failing its permanent location in London, should have found a home in Paris or Berlin, rather than in Edinburgh or Dublin.

Our great provincial centres will then have to establish and maintain art galleries and museums from their own resources, and they are well able to do so. Direct pecuniary assistance from the State is out of the question. Imperial help and guidance of another kind, however, they may justly claim, and it is the thoughtful and effective organisation of this indirect help which is now the question before us. Great and precious masterpieces, then, be they pictures, drawings, sculptures, goldsmiths' work, pottery or in whatever shape they have embodiment, as a rule must remain the fixed appanage of metropolitan, not the occasional and fluctuating ornaments of provincial centres. From the nature of many of these categories the specimens could not be frequently moved about without certain deterioration and the risk of ultimate destruction. The pot may go often to the well, but it is broken at last. When I say that the time has come for restraining to some extent the South Kensington practice in the matter of circulation of loans, I mean not that there has been too great liberality in this respect, but that adequate care and discrimination have not been shown in the all-essential matter of selection, *i.e.* in the determination of what might or should, and what should not, be rendered movable.

If, however, it will be objected, provincial museums and galleries are not to expect from the State either the permanent cession or the temporary loan of great masterpieces of art, and at the same time are to be given no encouragement to acquire such works from their own resources, what remains for them to do? Are they to become merely secondary repositories for all such dubious treasures as are not considered up to the mark of metropolitan standards? As a matter of fact, this is the present *status* of the great majority of these institutions, and by aiming at the impossible it is likely to continue so. Local managers of such institutions seldom have the knowledge, and in the nature of things they cannot have the opportunity, to bring about higher results. Their aims and objects, then, must be different.

The fundamental bases and objects of provincial art institutions should be educational, and it is in this field that the State can and should render infinite assistance. London, Paris, Berlin, Vienna, Florence and Madrid are, and must remain, the chief abiding-places of the world's choicest art treasures, for those treasures are, in truth, the common property of the world at large, and every year's abridgment of the obstacles of time and space and the amelioration of international community render them more and more so.

These treasures nevertheless can, from the marvellous results of modern invention, be, as it were, garnered together and brought home to every man's door in guise scarcely less vivid and truthful than in their original garbs. In other words, an infinite number of marvellous and most perfect reproductive processes have in our time enabled nearly all classes of works of art to be practically multiplied *ad infinitum*. In this field of artistic reproduction, it is true, South Kensington has done much; but here, again, the lack of adequate directing power has gone far to neutralise the efforts made. There has been a sufficiency of zeal and no lack of funds, but the knowledge has been wanting. It is mainly the gathering together and the wise ordering of this immense material which local art institutions should take in hand, and in this practically boundless field the State should take the lead, and every metropolitan institution be called upon to assist.

Moreover, all our metropolitan museums and galleries are sure in the long run to become overburdened with much original matter, genuine and beautiful works of art, which nevertheless, as duplicate specimens or of minor value to others subsequently acquired, could be got rid of with positive advantage.

In the collocation of such superfluous original typical examples, with photographs, engravings, casts, &c., of the greatest masterpieces of similar kinds, lies the boundless field I have indicated. Such a work is not less difficult or less worthy of the most eminent and gifted specialists than that of the actual conduct of our great metropolitan museums. It is a field in which at present the labourers are few and the incentive advantages uncertain. It is for the State to seek out and properly remunerate and encourage duly accomplished and devoted workers.

BIRMINGHAM ART SCHOOL.

AT the opening meeting of the session of the Birmingham Art School the Mayor said he was very glad to congratulate Mr. Taylor, his assistants and the students upon the result of the last year's work. The figures received from South Kensington showed that they had eclipsed themselves, and considering what they had done in past years that was saying a great deal. For many years past their chief competitor had been Manchester, and, whilst a year or two ago they were a little behind, they had this year passed Manchester in the race, and while he should not like to say anything to hurt the feelings of their friends in the north, yet Manchester was nowhere compared with themselves. They were able to compare themselves, not only with English towns, but with those in Scotland as well. He was staying a week ago with a friend who was interested in similar work at Aberdeen, and in the course of conversation that gentleman said, "Aye; but you have no idea what a wonderful school that at Glasgow is." He (the Mayor) was willing to admit that at the moment he knew nothing at all about it, but he ventured to assert that the Glasgow school was "not a patch" on the one at Birmingham. He thought he was perfectly safe in making such a statement, and it was fully confirmed by some particulars which had been furnished to him by Mr. Hytch. The Glasgow authorities were very proud of their institution, and in stating the results of their competition for the year they put this note:—"These results place the Glasgow Schools of Art, with those of Manchester and Birmingham, as the most successful schools of art in the United Kingdom, and the medals taken equal those awarded to all the other schools of art in Scotland." That was a very good note, and they had quietly put themselves in very excellent company in the shape of Manchester and Birmingham. He would give them particulars of the Glasgow competition as compared with their own. They had each got one gold medal. Glasgow had got five silver medals and Birmingham six. Glasgow had eight bronze medals and Birmingham had ten. Glasgow had seven Queen's prizes and Birmingham thirty. Glasgow seventy-eight third-grade or highest prizes and Birmingham had 243. Glasgow had twelve prizes for advanced examination against twenty-one given to Birmingham, sixteen free studentships against thirty-eight at Birmingham, and twenty-one second-grade prizes against Birmingham's fifty-six, or a total of 148 prizes and free studentships against Birmingham's 405. Out of 2,015 works selected for the national competition 120 works were chosen from the Glasgow school against 290 from Birmingham. Glasgow obtained 245 passes in the advanced local examinations, an increase of 103 on their last year's record, but Birmingham passed 442. Forty-nine Glasgow works were accepted for the art masters and teachers' certificates against Birmingham's 217; while 209 passes were made in the second-grade examinations and building construction against Birmingham's 561, making 503 for Glasgow against 1,220 for Birmingham. He thought it would be agreed that when their Mayor did go into foreign parts and made a statement concerning them, he was always strictly within the limits of truth. So much for Glasgow. Now with regard to their own branch schools. The figures as compared with last year were extremely interesting. The results were as follows:—In 1891 the total number of papers sent in was 1,551, of which 814 passed, against 1,362 last year, of which 688 passed; in other words, 52½ per cent. passed this year against 50½ per cent. last year.

The branch schools also received a bronze medal and a national book prize, twenty-five third-grade prizes, and thirty-three works were accepted for the art teachers' certificate. He thought these results were subject for extreme congratulation, but they must bear in mind that having attained to this high standard, they must not fall back. With the thorough grounding the students had under excellent teachers, he believed there was no fear of retrogression, but it was quite possible that the results to which they had attained would not be kept up without a great deal of hard work. Mr. Hytch also mentioned a matter which he thought would interest them. It was that Mr. Oliver Wheatley, who had obtained the gold medal for modelling, was a working modeller and designer for electro-platers, who eight years ago joined the Smith Street branch school. He remained at that school for two years, and then came to the central school. For some years he was only able to attend the school in the evening, but in 1888 he obtained a scholarship of 20*l.* per annum, tenable for two years, and this enabled him to give part of his daytime to attendance at the school. This record showed that it was quite possible for a student in a branch school, working in the day and attending the school in the evening, to obtain some of the highest rewards, and they might congratulate themselves on Mr. Wheatley's success.

Mr. Taylor, the head-master, also addressed the students. He said he observed with great pleasure that many of their architectural students were going through a thorough course of art study, instead of as formerly only such art as should be expressed with the T square and compasses. In previous years local prizes had been offered for architectural designs of modest pretensions. This year it was an open competition as to subject, and he warned students against attempting cathedrals, colleges, municipal buildings, &c., but rather to attempt such class of subjects, moderate in size, as had been selected in previous years for competition. He heartily congratulated masters and students on the all-round success of the year.

THE GREEK THEATRE.

THE first theatres that were constructed at Athens afforded, like the drama at its origin, but a faint outline of the magnificence which characterised them afterwards. They were of wood, and hastily erected, consisting of benches gradually ascending. These in course of time gave place to structures of more solid and permanent materials, in consequence, as we find it mentioned in Suidas, of a fatal accident having well nigh taken place from a sudden fall of the benches during the performance of a tragedy of Pratinas.

In their details respecting the Greek theatres, moderns have been in a principal degree obliged to compile their accounts from writers who have treated expressly on the subject, amongst whom Julius Pollux and Vitruvius occupy the chief rank. These and the traces of ancient theatres which are still extant, supply in some measure the want of any certain light derivable from the Dionysiac theatre of Athens, the vestiges of which are so scanty as to leave even its site in some degree of doubt. Stuart conceived that he had ascertained it in that of ruins which later travellers have pronounced to belong to the Odeion of Herodes, assigning the locality of the former to the south-eastern angle of the Acropolis, as well from the existence of choragic monuments in that quarter, as of a temple of Bacchus (Dionysus) from which a statue of that god was taken which is now deposited in the British Museum. A hollow in the slope of the hill which now exists points out the place where the seats of the spectators must have been excavated.

The entire outline of the building, as it lay on the hollow of a hill, must have been that of a semicircle with its arch upwards, joined to a parallelogram of considerable breadth at its base. Between the apex of the semicircle and the rocks of the Acropolis above it, it is scarcely conceivable but that some communication was opened; yet it must have been very narrow, in order to prevent the escape of sound from below. The main entrances to the theatre were at the opposite ends of the parallelogram below the spectators' semicircle, or at the right and left extremities of the dromos, which extended in front of the stage and its flanking walls. The upper part of the theatre, which was appropriated to the spectators, was enclosed by a massive semicircular wall and a portico within it, which served as a station for the slaves who attended their masters to the play, and also as a place of resort for the spectators, independently of the double portico, the eumenic, as it was called, which lay behind the scenes. Inside of that wall and portico the benches descended (for we conceive ourselves to look down upon the stage) in concentric semicircles, which diminished as they approached and embraced the protruding crescent of the orchestra. The curvature of the seat-rows thus inclined the faces of all the spectators towards the centre of the building, so that the terminating seats on the right and left were duly opposite each other, like those of our boxes nearest the stage. The entire amphitheatre of seats was divided into belts or stripes by passages sweeping round them in profile, and again into wedge-like masses by flights of steps that radiated upwards from the lowest to the highest benches. Twelve feet lower than the lowest benches, yet still projecting into their convexity, came the crescent of the flat orchestra, which was never occupied by any spectators. In the middle of the basis-line of that orchestral crescent was the thymele, a slight square elevation with steps, and a platform, which was the rallying point of the chorus. Around this the dances of the chorus described a small circle, the one-half of which was within the orchestral crescent towards the spectators, the other behind the thymele, and stretching nearly to the front stage. A part of the orchestra-ground entered, therefore, into the dromos. After enclosing the spectators and the interior orchestral crescent in one vast semicircle, the walls of the theatre ceased to describe a curve, and ran on straight to join the right and left extremities of the paraskenia, or flanking buildings of the stage. Of course they thus formed the two ends of the dromos, and the continuity of their masonry was interrupted only by the two grand and opposite entrances to the theatre. To protect the actors from the inclemency of the weather, these entrances were covered in; indeed, the whole stage was provided with awnings for that purpose; but the spectators were left very much to their own resources until the period of the erection of the large Roman theatres, over the entire of which coverings were extended. To supply this deficiency in some degree in the Greek theatres, the porticoes above-mentioned were constructed within the precincts of the building.

The stage-ground with its flanks (paraskenia) formed a line as broad as the amphitheatre of spectators; but the stage itself was somewhat narrower than the orchestra, to which it was directly opposite. The level of the stage was the same as that of the lowest benches; consequently, as many feet higher than the orchestra; but the whole wall of the stage-ground rose to the same height as the wall on the outside of the highest benches. The stage was connected with the orchestra by stairs, for though the choral and stage performers had a generally distinct locality, it is evident that there was a connection in acting between the orchestra and the stage. The stage itself was twofold. One division, called the logeion, projected beyond the paraskenia, and being meant merely for declamation, was constructed of wood, the better to reverberate the voice. Behind it there was a chasm for holding the roll of the curtain, for that disguise, though it was seldom used, was drawn upwards by the Greeks, and not downwards, as in our theatres. Immediately behind the logeion lay the proskenion, or proper stage, which having often heavy plastic scenery to support, was made of stone. This was the division of the stage particularly appropriated to the actors. The entrances into it were from a temple, or some ornamental structure placed directly behind, and two other edifices of inferior size and decoration at the flanks, in the apartments of which nearest the stage were kept the machines for moving the scenery. The first of these buildings was appropriated to the persons of the drama of the highest rank, while those of the lower entered from the last two. Their upper apartments were termed episkenia, wherein the movements were executed by which the phenomena of stage exhibition were represented, the lower paraskenia, the tiring rooms of the actors, from which there were passages into the orchestra exclusively of the one already mentioned, whereby it was connected with the stage.

The scenery employed by the Greeks was so contrived as to turn round or draw aside, the latter corresponding to that used in our theatres. The decorations which it was necessary to introduce in order to mark the locality of the piece were of two kinds, the lower, plastic imitations of objects, chiefly in wood, the upper, paintings on canvas or boards. They must have been highly imposing, as the Greeks availed themselves of every opportunity to affect the senses; and the knowledge of perspective, which it is now well ascertained they possessed, as well as the ample dimensions of their theatres, afforded them abundant means of doing so. To such an extent was this carried, that they spared not on some occasions—for example, the representation of the Œdipus at Colonos—the introduction of natural trees to adorn the landscape. They had also their theologeion, or place of conference of the gods, which was surrounded by a picture of clouds, and issued most probably from the top of the central stage-building. The charonic steps were situated at the extremity of the orchestra farthest from the stage, and beneath the lowest seats of the spectators; through these infernal spirits and phantoms ascended. The impressions made on a superstitious people by such representations can be but faintly estimated by our less credulous imaginations; yet even a modern fancy must be torpid, that, in reading Æschylus, experiences not high excitement when the ghost of Clytæmnestra rushes in to awaken the Eumenides; and the grandeur of terror in spectral agency was certainly never made more perfect than where that poet invokes "the slumbering furies and the sleepless dead."

TESSERÆ.

English Blazonry.

IT is sufficiently clear that at an early period of the art of blazon, long before the incorporation of the College of Heralds, not only the military but also the commercial section of the community had their appropriate and significant coat-armour. The absolute necessity of seals for legal purposes must have contributed materially to its fabrication. In the third seal of one charter the devices are not placed upon a shield, and in the anonymous seal the leopard's head is not the charge of a shield, but an attendant badge; but when the badge or device, composed either of one or more figures, was once, as in the other examples, placed upon a shield, it settled into a "coat of arms," and, handed down in that form to posterity, it became the symbolic evidence of descent, alliance and consanguinity. Even in the reign of Edward I. the fraternities of London had their several cognisances or badges, worn on the sleeve in the same manner as for many subsequent centuries by the retainers of the nobility, and still by the almsmen of some public charities and by watermen, firemen, &c. When the citizens, in the year 1299, went out to meet the new Queen Margaret they were all attired in one livery of red and white, but had on their sleeves the distinctive badges of their crafts. Fabyan's "Chronicle" says:—"The quene was conveyed unto London, agayne whom the cytezyns upon the nombre of vi. C. rode in one lyverey of rede and whyte, with the conysaunce(s) of dyvers mysteries browderyd upon theyr slevys." It would be an interesting discovery to find a list of these cognisances, and to learn how far they have been handed down in the existing shields of the companies and of private families.

The Camp at Wimbledon.

In his work on "The Environs of London" the Rev. Daniel Lysons describes the entrenched camp at Wimbledon as of circular form, double ditched, and enclosing an area of about seven acres. He says that this camp was called, in the time of Camden, Bensbury, who considered it to mark the place of the battle between Ceaulin, King of the West Saxons, and Ethelbert, King of Kent, fought in the year 568. There appears to be no other foundation for this suggestion than the following statement of the Saxon Chronicle under that date:—"This year Ceawlin and his brother Cutha fought with Ethelbyrht and drove him into Kent, and they slew two aldermen, Oslac and Cnebba, at Wibbandun." Camden probably thought he identified Wibbandun with Wimbledon, and Bensbury as Cnebban's Bury, the sepulchre of Cnebba. There is no necessity for controverting these hints of the father of British archæology, although there may be reason for assigning a much earlier period than the sixth century for the entrenchment extant at Wimbledon. Round the exterior side of the ditch a way was constructed, protected by a parapet of earth, affording a position for a line of armed men, who would be supported by a second line of defenders whose javelins or arrows might be propelled over the heads of the first line, thus subjecting an assailing enemy to the galling effects of a double discharge of missile weapons. Writers on the military antiquities of Britain have considered that it was a principle of tactics with the Britons to arrange their forces on concentric circles of ramparts rising one above the other, and that the celebrated Herefordshire beacon on the Malvern hills is a remarkable specimen of that mode of defence. We have but few rules for discriminating between Roman and British fortifications. There is no decided ground for supposing that the Romans often deviated from the square form of castrametation which their military writers have described. When they did so it was probably for the purpose of taking advantage of a peculiar position of ground. Thus, an area surrounded on three of its sides by a river would be protected on its fourth by a vallum and foss, forming as it were the string of the bow. Of this mode of arrangement a very striking instance is to be found at Bittern, near Southampton, the ancient Clausentum. Now, where all positive evidence of the period and people to which the construction of an ancient earthwork may be assigned is wanting, we can with great degree of confidence refer to the appellation which it may have retained in the course of ages. In whatever name vestiges of the British term Dinas, Dunum, Din—often softened into Ton or Tune—may be found, there we may suppose a British origin to be indicated. The word implies a fortified elevated post, and that it sometimes only designates an elevation, as Rainham Down, Barham Downs, the South Downs, &c. The application of the British word Din or Dunum to fortified cities will be traced in the places mentioned in ancient itineraries which have descended to our time, as, for example, in Londinium, Sobiodunum, Camalodunum, Muridunum, Uxellodunum, &c. These British Dunes were the oppida described by Cæsar; they were placed on elevated spots, often surrounded by woods, and most commonly near springs of water. The Raths of Ireland are fortresses assignable also to Celtic tribes. On the advent of the Saxons, British and Roman military enclosures frequently obtained the titles Burgh, Byrig, Barrow, or Ceastre in exchange for their more ancient names, Gaer, Dune, Castrum, &c. And Dune was often softened into Ton. Thus Sobiodunum became Sarisbyrig, and Cæsarisdunum or Kæsarsdun, a well-known Roman post, was converted into Keston. Now we may remark that the entrenched camp at Wimbledon has all the characteristics of a British stronghold; it is still placed in the vicinity of woods at a short distance from Coombe Wood near Kingston; oaks at this day are still growing on or close to its ramparts, the offspring of an older family of forest trees. There is a fine spring of water in an adjacent hollow commanded by the works, and in the range of the horizon from Epsom Downs southward, to Harrow, Hendon, Stanmore, &c. northward, the eye traverses a broad expanse of country. The termination Don proclaims indelibly its British origin, and we may concur with Lysons in the idea that the prefix syllables have been conferred from a Saxon proprietor, Wimbald, which he tells us is a Saxon name. Two points of history are, therefore, laconically comprised in the name Wimbledon, namely, that a British dune or fortress was established on this elevated spot which passed at length into the possession of a Saxon lord.

Early Irish Habitations.

Despite the dignity of Hibernian heroes from the days of Pelagius and St. Patrick in the fifth century, and the respect their schools and colleges acquired abroad, their habitations and those of their countrymen and cotemporaries appear to have been of the very simplest. Detached houses of stone were erected only at somewhat late dates, that material in early days having been reserved almost exclusively for the round towers and crosses, the small churches and the military defences with the rude huts enclosed within them. The dwellings themselves appear to have been constructed for the most part of wood or of wattles, with clay filling in the interstices. Remains of ancient stone and earthen forts, in which numerous habitations were included, are still frequently met with throughout Ireland, though vast numbers have no doubt been destroyed by time and from the land having been brought more generally into cultivation. The fortresses known as Cahirs (Caer. Welsh?) or Cashils (Castles?), amongst which are Tailtin, Tlachtgha, Tara, Croghan, the Grianan of Aileach, in the county of Donegal, &c., are built invariably of stone, and appear to have been the strongholds of the then numerous princes and chiefs together with their followers. The hill forts, called "Duns" or "Lisses," though occasionally formed of earth when stone was difficult to be procured, are chiefly built of the latter material, and entirely without cement, the walls often being many feet in thickness. They are generally circular, and all contain small chambers, consisting only of flat stones laid across large upright ones, and from the quantities of bones found in some of them they appear to have been used as well to contain stores of provisions as for the protection of the women and children. The earthen forts called "Raths" are chiefly, if not exclusively, to be found in the plain. Like the stone forts, their enclosures are generally circular, and in the raths these are always formed of an earthen embankment from four to eight feet in height, which was probably strengthened by a wooden stockade upon it. In some cases these forts were rendered more difficult of attack by the addition of a ditch, which surrounded them outside the embankment. Mr. Wakeman, who has carefully studied these singular constructions, states that "of the number of raths which he had examined he had not in one instance known the mound to contain a chamber, but when the work consists merely of the circular enclosure of which mention has been already made, excavations of a bee-hive form, lined with uncemented stones and connected by passages sufficiently large to admit a man, are not unfrequently found. These chambers were probably used as places of temporary retreat, or as storehouses for corn, &c., the want of any ventilation save that derived from the narrow external entrance rendering them unfit for the continued habitation of man. We are not aware that any rath in the neighbourhood of Dublin contains a chamber or chambers of this kind. They are common only in the southern and western parts of Ireland, but subterraneous works similar to those usually found in the forts of Connaught and Munster occur in Meath, and perhaps in other Leinster counties." Within these defences, whether of stone or earth, were usually built the huts of wood or wattle and clay, or the small stone cabins called Cloghauns or Clochauns, in which the people lived, the enclosures giving protection not only to them, but also to their cattle and stores, which in those days were in constant danger from robbers, beasts of prey, or the attacks of hostile tribes.

Clay Puddle.

Puddle is as great an auxiliary to the engineer as concrete, and the best definition that can be given of it is in the following words—a mass of earth reduced to a semi-fluid state by working and chopping it about, while just sufficient water is applied, until the mass is rendered homogeneous and so much condensed that water cannot afterwards pass through it. The best

puddling stuff is a rather lightish loam with a mixture of coarse sand or very fine gravel in it; the very strong clays are inferior on account of the great quantity of water which they will hold and its disposition to shrink and crack as this escapes; anything in the shape of top-soil is entirely improper on account of the quantity of roots and vegetable matter it contains. When a puddle ditch has been dug clear out to its proper depth about nine or ten inches in depth of puddling stuff is thrown in, from which all large stones, sticks or weeds are carefully picked out; water is then ladled in with a scoop, so as to give the puddling a good wetting. If the puddling stuff be stiff or dry it may then be left for two or three hours, merely giving it another wetting in the meantime if necessary. The puddler may then proceed with his work. Being provided with a stout pair of puddling boots, he begins at one end of the trench and keeps chopping with his tool, and quite through it, giving his tool a lunging move every time before he withdraws, so as to let the water into the puddling stuff and stir it right through; if more water be wanted another labourer supplies it as the puddler works on. This man thus proceeds chopping and trampling over every inch of the ground as he works down the trench until he gets to the end, he then returns and repeats the operation until the stuff is thoroughly worked up. This is ascertained by the tool going with equal ease through every part of the stuff, which it will not do if there are any dry, hard lumps. A proper quantity of water is very essential to this work, and it may often have to be brought by means of a trench from some stream or pond at a distance to the works. When this is necessary care must be taken to provide the means of carrying the water off when it is not wanted. When the first course has acquired some solidity it will be time to lay on the second course, which must not be of greater depth than ten inches; water is then applied and the puddling recommences, care being taken that the tool at every chop sinks right down through the upper course into the lower one, so, as it were, to bond them together. A trench thus puddled should never be left uncovered so as to dry. As the puddle is raised, two or three rows of sods or spits of earth should be raised on each side to raise the bank, if the puddle-trench be in a bank, and the slopes are formed gradually on each side by fresh stuff being wheeled up until the bank is entirely formed, and then the puddle is covered completely up with ordinary stuff until the bank is raised to its proper height. Where the light loam is not attainable but only clay, mix sand or fine gravel with it if attainable; if only gravel, screen it so as to get rid of all stones larger than a bullet, mix clay with this if attainable, or chalk where it is to be had. A great part of the difficulty lies in the working of the stuff. The real value of puddle, properly made and well worked, may be ascertained by any one who has had an opportunity of excavating into it years after it has been formed. Having pointed out the great advantages of puddle, it will be desirable to say a few words of its disadvantages. This useful building auxiliary is liable to contract from summer heat if exposed to it, and therefore requires to be protected from this influence, and it will be the more liable to contraction if much water has been used in the working of it and if composed of clay. This is one of the reasons why sandy loam is preferred, and in some cases even fine gravel mixed with chalk, or over which a grouting of rich lime is poured as the puddling process is carried on.

Early Explorations in England.

Under the Anglo-Saxons, down to a late period, our island appears to have been covered with the majestic remains of Roman towns and cities, although people had been gradually clearing away many of them in order to use the materials for new buildings. As early as the middle of the seventh century when the monks of Ely wanted a stone coffin for the body of the Abbess Etheldreda, they sought for it among the ruins of the Roman town the site of which is now occupied by the town of Cambridge. Bede relates how they "came to a small deserted city which, in the language of the Angles, is called Grandchester, and presently, near the city walls, they found a white marble coffin, most beautifully wrought, and neatly lcovered with a lid of the same kind of stone." At a much ater period we shall find the Abbots of St. Albans collecting the materials furnished by the ruins of Verulamium (or, as the Saxons called it, Wærlam-ceaster) to build their church. Many Anglo-Norman works still existing are built in part of Roman materials. We find also that at an early period people, not content with taking what was above ground, made excavations under the soil in search of the relics of ancient days. It seems probable that the different tribes who occupied the ground frequently opened the barrows of the tribes who had preceded them in search of treasures. The earliest mediæval poems, such as the romance of Beowulf, speak of the treasures of a primeval age, consisting of cups and other vessels, personal ornaments and weapons, rescued by their heroes from beneath the tumulary mounds of the giants, according to the belief of the unconverted Germans, or of the heathen according to the Christianised notions. We hear of the opening of barrows as late as the thirteenth and fourteenth centuries, and the discovery of funereal deposits and of treasures. The Anglo-Saxons appear to have collected immense quantities of articles of Roman manufacture by excavating, particularly vases and other vessels of different materials, and the earlier rituals frequently contain forms for blessing these implements of pagan manufacture in order to make them fit for Christian use. One of these benedictions ("Benedictio super vasa reperta in locis antiquis") prays the Almighty to "deign so to cleanse these vases fabricated by the art of the Gentiles" ("hæc vascula arte fabricata Gentilium") that they may be used by the believers in peace and tranquillity; and another runs in these words:—"God, who by the coming of thy Son our Lord hast cleansed all things for thy believers, attend propitious to our invocations, and cleanse by the amplitude of thy grace these vessels, which, by the indulgence of thy piety, after a length of time being taken from the gulph of the earth, thou hast restored to the use of men." In many instances, particularly in the earlier times of the Anglo-Saxons, these Roman utensils appear to have been buried again in Anglo-Saxon barrows, which accounts for the discovery of mixed deposits of earlier and more recent articles in one place. The traces of these excavations appear not unfrequently in popular legends. It seems probable, from legends preserved by the old chroniclers, that the Italians of the tenth, eleventh and twelfth centuries penetrated into some of the Etruscan tombs. Gerbert, the mathematician, after he had become pope as Sylvester II., was a great excavator. A story told of this celebrated man by William of Malmesbury, and which afterwards entered into the compilation of tales known by the name of the "Gesta Romanorum," seems to refer to the discovery of some spacious subterranean tomb of the early inhabitants of Italy; and the same historian tells us that in the eleventh century the Romans discovered the "body of Pallas, the son of Evander." More than a century after this a tomb was opened in the neighbourhood of Glastonbury which, it was pretended, contained the body of King Arthur.

Cologne Cathedral.

The original intention comprehended choir and double transepts, a stately nave with double aisles, a centre tower where nave and choir join, and two towers at the west end. The internal height of choir and nave alike, namely, 150 feet, that of the aisles and transepts 64 feet, the whole length of the building 500 feet, its width 150 feet, and the height of the towers 536 feet, which would have made them the highest in Christendom. Of this, the choir was finished, with a portion of the east wall of each transept. The north aisles had attained their destined height, the four great windows complete, with coloured glass in them, and seven compartments of the roof groined over. The south aisles had stopped midway, their interior piers having only reached the height of 42 feet, and the windows being arrested at the spring of the arch. The southern tower had grown up in two storeys to the elevation of 170 feet; the northern tower stood like a tooth just piercing the gum, one pier partly through to the height of 22 feet, the rest still below the surface. Part of the façade of the northern transept was visible about six feet; and of such portions of both transepts, west front and northern tower as were not yet above the earth, the foundations were supposed to be perfect within. Thus there was a gap between choir and aisles, another between north and south tower, and a vacant space in the nave. In other words, the head was perfect, the shoulders just begun, the legs with one foot partly grown, but the whole body still wanting. For present use, therefore, temporary roofs had been thrown over the southern aisles, and such compartments of the northern as had not been groined with stone. The gap between choir and south aisles was filled up by a temporary wall; that between choir and northern aisles supplied by the intrusive church of Sta Maria, and a wooden screen run up between the two towers. Thus stood, therefore, the incomplete form of an all-complete idea, from which, as from a text-book, almost every religious edifice erected contemporaneously had drawn instruction, which had contributed to build Strasburg near and to finish Burgos afar off, and which shows its helping influence in Freiburg, Ratisbon, Prague, Utrecht, Amiens, Beauvais, Chalons, and numerous other foreign churches that might be mentioned, besides supplying an architect to our own York. There stood the imperfect specimen of the most perfect period of ecclesiastical Gothic, so full of thought that every detail has a meaning, so practical in adaptation that every detail has a use, so true in structure that were the walls knocked away it would still stand firm on its piers like a tent; and, with all these causes combined, so perfect in national beauty that Boisserée has christened it "the Canon of German architectural law." And centuries passed away without knowing it to be such. Nay, far from appreciating the tenth wonder of the world that stood among them, men looked upon it with ill-will, as a monstrous mistake, which the barbarity of their forefathers had entailed upon them, an eyesore to their city and a drain to their pockets, and to be kept standing only to avoid the greater cost of pulling it down.

NOTES AND COMMENTS.

THE fourth centenary of the discovery of America by the "royalest sea-king of them all" will be celebrated next year in Spain. It is proposed to have, among other manifestations, a retrospective exhibition containing objects illustrative of the art of the fifteenth, sixteenth and part of the seventeenth centuries, in order that the degree of civilisation then attained by Europe, and especially by Spain and Portugal, may be understood. It will also serve to suggest the influence of the discovery of America upon Europeans. The exhibition will comprise sculpture, painting, engraving, mosaic, goldsmiths' work, panoplies, vestments, tapestry, bookbinding, illumination, furniture, pottery, glass, carriages, &c. The exhibition will be opened in Madrid on September 12, 1892—the anniversary of the landing of COLUMBUS (some maintain the date was a month later) at San Salvador—and will be closed on the last day of the year. Objects which are offered for exhibition will have to be sent in during April, either to Madrid or to the offices of local committees. All exhibitors will be presented with season tickets. A novelty in the arrangements is the institution of a competition among the exhibitors. The owner whose loans are considered to be most interesting will obtain a grand prix d'honneur. There will be also a gold medal, a silver medal, a bronze medal, and a certificate to reward those who possess exhibits that afford lesser interest.

WE lately called attention to the condition of the drains of St. Bartholomew's Hospital, which were likely to become a source of danger to the City. The civic authorities have not allowed the subject to be ignored. At the meeting of the Commissioners of Sewers on Tuesday, a letter from the clerk to the hospital was read. With it was a joint report of Mr. E. B. I'ANSON, architect, and Mr. COUSINS, C.E., as to the reconstruction of the drains, and they invited the observations of the Commission upon them. The works will cost 3,142*l.* It was decided that the plans be submitted to the medical officer of health and the engineer for their consideration and report. The works may seem to create an onerous burthen which the hospital committee may not easily support, but the removal of such a source of infection as the drains now present will be cheap at three thousand pounds.

STUDENTS of building construction may be glad to know that the courses of instruction at the Polytechnic will begin on Monday next. The classes are under Mr. C. F. MITCHELL'S direction, and the success of the students in various public examinations is the best testimony to the efficiency of the teaching.

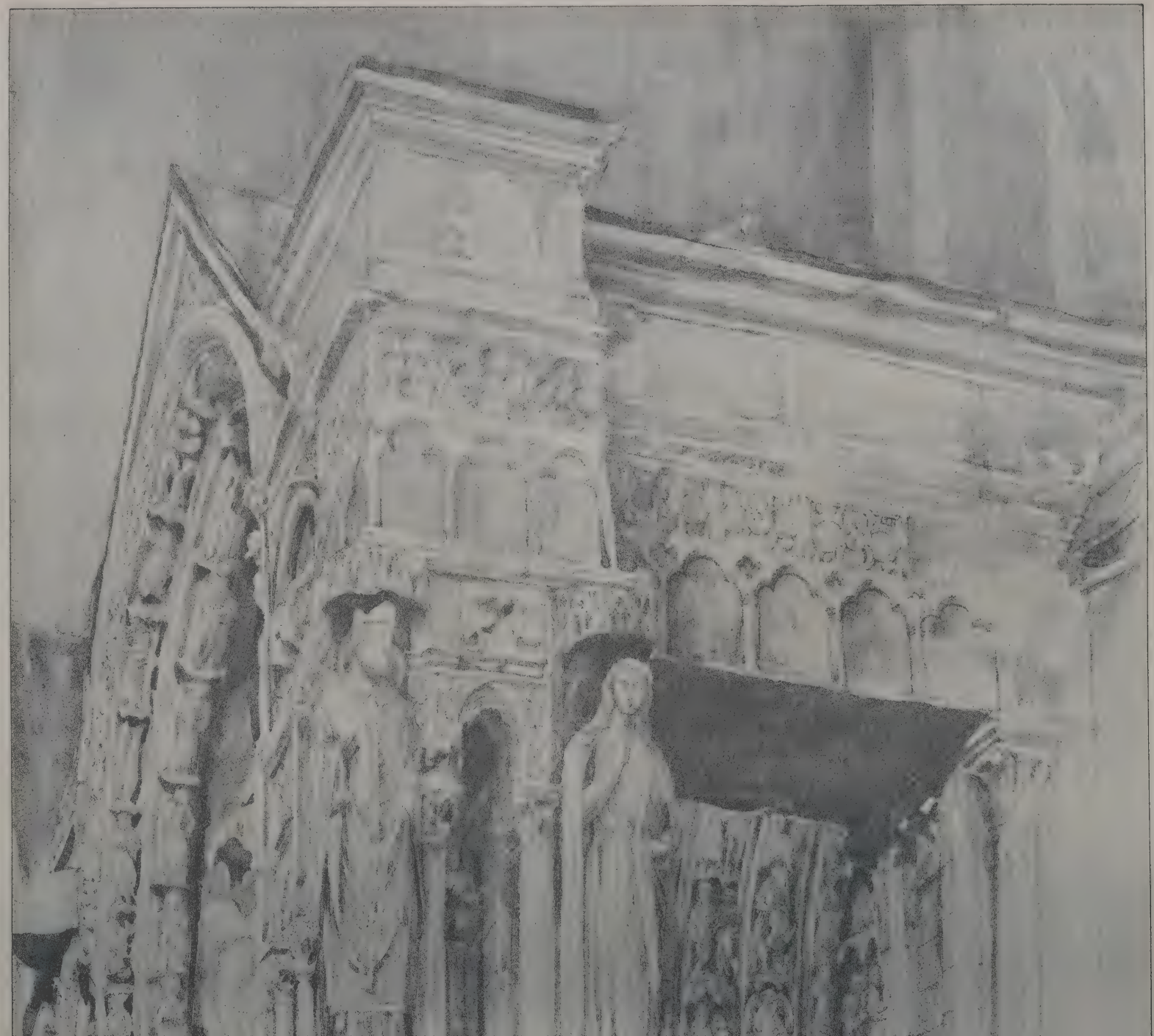
IT is only to be expected in the United States that an excess of freedom should be enjoyed by the Custom-house authorities as well as by the ordinary citizens. The imposition of duties in the Custom-houses across the Atlantic now seems to be dictated by individual freakishness. Every week there are new surprises awaiting all who watch the proceedings of the officials. One of the latest relates to architectural photographs. For many years it has been customary among architects and students, says the *American Architect*, to send and receive photographs from abroad by mail. In old times, any one who wanted photographs of particular buildings could enclose a postal order to the local photographer, or to BRAUN, LÉVY, the London Stereoscopic Company, or any other of the great dealers, and receive the prints he wanted with little delay, through the mails, free from duties; or an architect travelling abroad could send photographs home to his office or to his friends in the same way. After a time, the Customs laws received a different interpretation, and photographs were held to be dutiable, but they could still be sent in the same way, and delivered to the person to whom they were addressed, on payment of the duties. Recently, however, the privilege of sending photographs by mail, which has existed in every civilised country ever since photography was invented, has been taken away from the citizens of the United States, so far as foreign photographs are concerned; and such photographs are declared to be unmailable, and orders are said to have been sent to all post offices to confiscate them. It is impossible to conceive that this new regulation should have any object, and the case seems to be simply one where the officials were obliged to conform themselves to a different and authoritative interpretation of the meaning of a law which, of course, they did not make, and which may not have been intended to have such a meaning. If so, Congress will probably set the matter right next winter; but, in the meantime, American architects and students must abstain from sending European photographs by mail.

SOME of the statues in the gardens of the Tuileries are affected injuriously by the variations in the weather. M. GUILLAUME, the architect, who has charge of the gardens as of the Louvre, is accordingly engaged at present in directing the restoration of the figures. It will be necessary to have all the reparations completed before the winter sets in. In such a case the voice of anti-restorers would be unheeded. The French, although scientists, are not partial to statues which display the power of the atmosphere to overcome the cohesion of the particles of the marble. Works rendered imperfect in that way would have their use in a museum, but as long as they remain in a garden or a public place it is well they should be pleasing to the eye. For a similar reason the French are careful to fight against time in their buildings, and perhaps they are right, for if restoration is allowable with statues, why should it be unlawful with buildings?

THE Hastings Guardians of the Poor, who have been for months amusing themselves with exciting discussions about a new workhouse, have secured a fresh means of diversion. No doubt it was imagined that the architect who supplied the plans which gave rise to the debates and from time to time altered his design at the behest of the Board would be rewarded by co-operating in the entertainment of so many deserving gentlemen. The eloquence of the guardians at last became exhausted, and with it the project for erecting workhouse buildings. The architect's plans having served their purpose were returned to him. He was not satisfied with the use they subserved, and accordingly sent in a bill for 5,587*l.* 15*s.* The arrival of the document has been most opportune, for the orators wanted another theme, which the bill happily affords. On its appearance operations began. There are a great many ways of dealing with the bill, all of which will be gone through, and it has to be settled whether the contests are to take place before the reporters. At all events, the architect need not calculate on a prompt settlement.

IT was reserved for the end of the century to set up a statue of the Chevalier BAYARD, the good knight who was fearless and reproachless. It will be placed upon a bridge which is about to be constructed over the river Breda, in the town of Pontcharra. The sculptor who has received the commission is M. PIERRE RAMBAUD, and he has represented the hero on horseback, with the visor of his helmet raised, and pointing with his sword extended towards Italy. The Château Bayard still remains, and parts are well preserved. It is tenanted at present by a priest, who has reached the age of eighty-six, and who seems to be the fitting mourner over the days of chivalry that are gone.

IN order to obtain more money to defray the cost of the memorial of the painter, it is proposed to hold an exhibition of the works of MEISSONIER in Paris. The use of the galleries of the Ecole des Beaux-Arts has been granted for the exhibition. A great many of MEISSONIER'S works are in the United States, and application for a loan of them has been made by the committee. There is, however, one obstacle which is enough to frighten the owners of the pictures—that is, the duty which would have to be paid to allow the treasures to re-enter America. In order to secure exemption, the French Minister of Foreign Affairs and his representative have been exerting themselves. It remains to be seen whether they can prevail with the officials at Washington. There will be less difficulty about obtaining works from England. It is not likely, however, that the Wallace paintings can be again obtained.





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DESIGN FOR A
By ALBERT D

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NO. 411.—NORTH PORCH, CHARTRES CATHEDRAL. [H. WILSON.]

MEMORIAL CHURCH AT COLSTON BASSETT, NOTTS.

THIS church is now being erected by Mr. R. M. KNOWLES, of Colston Bassett Hall, and when finished will take the place of the present church. The exterior of the new church has been erected in hammer-dressed Coxbench stone, whilst Hollington stone has been used for traceried windows, string moulds, parapets, copings, &c., and the interior is faced with hammer-dressed Coxbench stone, with Corsham Down Bath stone dressings. The roof will be covered with the Buttermere light-green slate. Our illustration is from the drawing exhibited in this year's Academy, the architect being Mr. A. W. BREWILL, of Angel Row, Nottingham, and the contractors Messrs. BELL & SON, of Sherwood Street, Nottingham.

DESIGN FOR A TECHNICAL COLLEGE.

THIS illustration is a reproduction of a drawing by Mr. A. D. SMITH, which was exhibited this year in the Royal Academy, and obtained much attention.

PHIDIAS AND HIS SCHOOL.

THE renowned artist Phidias, the son of Charmidas, was born about five hundred years before Christ. He was originally a painter, and he carried the arts of painting and sculpture to a greater perfection than they had ever before attained. His brother, Panænus, also painted the celebrated *Marathon* in the Pœcile. In the art of making statues of bronze, both for the number and excellence of his works, Phidias was without a rival. His *Amazon*, but especially his *Lemnian Minerva*, were for many ages the admiration of the world for their faultless symmetry. In works of ivory also Phidias stands alone. The enthusiasm with which Cicero, Strabo, Pliny and Pausanias speak of his colossal statues of *Jupiter* and *Minerva*, which he executed in ivory and gold, can best be learned by consulting those writers; but there is reason to believe that Phidias himself did not approve of the application of this material to works of art—at least, not to works of that size, however it may have suited the capricious taste of the Athenian people. In an assembly of the people he is said to have earnestly recommended a different substance for the statue of Minerva which was to be placed in her temple in the Acropolis, but on the Athenians being informed that it would be cheaper than ivory they rejected the proposal. Besides these two colossal statues in ivory and gold, we do not hear of above one or two more executed in these materials by the same artist. The far greater number of his statues, which are expressly mentioned by the ancient writers, are in bronze.

Phidias, however, did not disdain efforts of an humbler sort; for, not to dwell on his statues in wood, plaster and clay, nor on certain pieces of minute mechanism, as fish and flies, ascribed to the same master, he was the first who discovered the true principles of carving in relievo, and, in the smallest productions of his art he preserved, according to Pliny, the same grandeur of execution which characterised his greatest works. The same author mentions in terms of high praise the Lapithæ and Centaurs, carved on the sandals of Minerva, and the workmanship of her shield, on the convex side of which was represented the battle of the Amazons, and on the concave that of the gods and giants. The shield, moreover, contained a likeness of Pericles fighting with an Amazon, and was put together so artfully that if a figure of Phidias himself (representing him as an old bald man, holding up a large stone in his hands to denote his being the architect of the temple) were by any means removed the whole shield must inevitably have fallen to pieces.

The masters of the greatest eminence which the school of Phidias produced were Agoracritus, Alcamenes and Colotes. Of these Alcamenes was the most distinguished; he is mentioned by the ancients as an artist of the greatest merit. We praise, says Cicero, that Vulcan at Athens which Alcamenes made, in which, though standing and covered over with drapery, there is an appearance of lameness without deformity. Valerius Maximus gives a similar description of it at greater length. Pausanias makes mention of a beautiful Bacchus from the hands of this master in ivory and gold, and two colossal statues of Minerva and Hercules, erected at Thebes, of Pentelic marble. But the masterpiece of Alcamenes was the group of statues on the pediment of the back front of the temple of Jupiter at Olympia, the description of which, in the Eliacs of Pausanias, affords so many singular coincidences with the statues upon the pediments of the Parthenon at Athens, that it is scarcely possible to entertain a doubt that both were erected nearly at the same period. It is not improbable that Alcamenes had attempted to imitate the latter, encouraged by the success of his master Phidias in a similar undertaking. Of the same Alcamenes we read in Pliny that he was a statuary of the highest merit, that many of his works still adorned the temples and that he had produced the incomparable Venus without the walls.

Another of Phidias's scholars, his favourite pupil Agoracritus, is chiefly celebrated as connected with the famous statue of Nemesis, the *Goddess of Vengeance*, at Rhamnus, near Marathon, in memory of the result of that battle. The history of this statue and its allegorical accessories, one of the departments of the art peculiar to Phidias, are too well known to be repeated here. To this statue was appended a label stating that it was the work of Agoracritus, but all the ancient writers who mention it, and particularly Pausanias, speak of it as the work of Phidias, and it appears to have been one of the most extraordinary productions in marble sculpture which the art has ever produced. Among other marble statues attributed to Phidias were the *Mercury Pronaos* in the temple of Ismenian Apollo at Thebes; a beautiful *Venus*, in the Octavian Museum at Rome; the face, hands and feet of the *Minerva Bellica of the Platæans*, from the spoils at Marathon (the rest of the statue was of wood and gold); the *Venus Urania*, in Parian marble, in the temple of that goddess in Attica; one of the colossal statues on the Esquiline Hill. The inscription is of later date, and therefore, exclusive of the merit of the sculpture, carries with it no other testimony than that of the notoriety of Phidias as a sculptor in marble. In the Augustan age and in that immediately subsequent to it, it was generally believed not only that Phidias frequently caused the names of his pupils to be inscribed on his own statues, but that he had given instances of the greatest skill in finishing the works of other artists. Amongst these last was the above-mentioned statue of *Aphrodite* by Alcamenes. To this extraordinary talent, which we must suppose was chiefly exercised in works of marble, Cicero alludes.

With respect to the particular character of the sculpture of Phidias, we may gather from the language of the ancients respecting him that he had no competitor at least for posthumous fame—that his excellence in his own art became a proverbial term of comparison by which to illustrate that of all other persons whatsoever in their particular departments. As an elegant modern French writer has observed, "The sculptors who preceded Phidias could not divest their statues of a certain stiff and dry formality. Phidias was the first who gave to his style, according to the expressions of the ancients, grandeur, majesty, gravity, breadth and magnificence."

But words were inadequate to express with sufficient energy the admiration which the ancients felt for the style and character of the works of this celebrated artist. They compared them to the style of Thucydides and of Demosthenes. Yet the masculine beauty portrayed by the hand of Phidias was combined with sweetness, with elegance and with grace. Equally ingenious as he was sublime, he executed great works with energy; those the more inferior, with simplicity and truth. His style, which varied with his subject, was at the same time grand and refined. If Phidias had not applied all his powers to portray the slightest shades and the most delicate lines, he never would have reached that expression of life peculiarly his own. His style was truly admirable, because it "united the three characters of truth, grandeur and minute refinement."

Plutarch, in his life of Pericles, tells us that that munificent and enlightened patron of the arts appointed Phidias the sole director of all his public works. All the other artists, however eminent, received his orders. Of these, Callicrates and Ictinus were particularly employed upon the Parthenon. Phidias and Pericles, who seemed to live for each other's glory, and to combine their joint exertions in order to embellish Athens, were frequently the objects of jealousy to the Athenian people; and Phidias fell a victim to their animosity for attempting to give to his own name the immortality which it was not doubted would be the inheritance of his works.

Plutarch, in speaking of these works, describes them in the following terms. After observing in general that those which were slowly executed were likely to be the most durable, he adds:—"Hence we have the more reason to wonder that the structures raised by Pericles should be built so quickly, and yet built for ages; for as each of them, when finished, had the venerable air of antiquity, so even now they retain the strength and freshness of a modern building. A bloom is diffused over them which preserves their aspect untarnished by time, as if they were animated with a spirit of perpetual youth and unfading elegance."



HOUSES AND SHOPS, HEADINGLEY, NEAR LEEDS.

This block of buildings was recently erected from the designs of Mr. T. BUTLER WILSON, of Leeds and Harrogate.

AT STIRLING WITH THE "ARCHITECTS."

A LADY CORRESPONDENT, who accompanied the party of Dundee architects on Saturday, gives the following account of the journey in the *Dundee Advertiser* :—

My best apologies to the "Architects"! I should have said rather the Dundee Institute of Architecture, Science and Art, but the tendency of the age is in the direction of lopping off all superfluities of speech, and so the sonorous and mouth-filling title of the Association is generally discarded in favour of a briefer appellation. The Institute has become an important factor, not only in the professional but in the social life of the city, for, besides arranging a useful series of lectures during the winter at which technical subjects are discussed, it gets up capital conversaziones, and when summer-time comes round it has most enjoyable excursions. The first of these this year was a visit to Anstruther, Crail and other of the quaint burghs of the Fifeshire coast; the second and last took place on Saturday, when a party of members and friends visited Stirling. At all these functions the "Architects," ever mindful of that important branch of their profession which concerns itself with decoration, are used to invite the presence of ladies, and there was a goodly sprinkling of the superior sex in the company on Saturday, although the party was smaller than it might have been on account probably of the unsettled state of the weather. The weather, indeed, supplied a pleasant element of uncertainty to begin with, for though the sun shone out gallantly there were plenty of clouds to be seen, and no end of ominous whispers about prematurely bright mornings turning into rainy days, &c. The weather for once disappointed our fears, however, and behaved in the most charming way. Even the clouds which discomposed us at the outset added to the beauty of the fair landscapes through which we passed, their changing shadows chequering the hillsides with lovely effects of light and colour.

It was a beautiful route all the way, first beside the winding Tay rolling full-brimmed to the sea; beneath the shadow of stately Kinnoull Hill with its rich mantling of trees, and by the marshy backwater where "Chill October" was painted; and then by the "Bonnie Earn," which flows through its lovely pastoral landscape, with a glint of light here and there as it flows through Lady Nairne's poetry and her songs; alongside the Ochils, grassy to the summit and dappled by the passing cloud, on to Allan Water with its pathetic ballad memories; by fair Dunblane, whose ruined fane has been restored to a semblance of its former glories; and so on to Stirling town, perched upon its rock and overlooking the fair and fertile Carse of Forth.

We left the West Station at 8·20, and were in Stirling shortly before ten o'clock, after a wonderfully rapid and pleasant run. Arrived at Stirling, we were welcomed by a party of local gentlemen, who constituted themselves our guides in viewing the town—viz. Provost Yellowlees, Dean of Guild Millar, Treasurer Ronald and Mr. Walker, architect—and never had visitors better cicerones. The Provost, in particular, was an invaluable acquisition. A son of the Rock himself, he is thoroughly imbued with love of his ancient town, its antiquities and traditions, and led us from point to point of interest with unflagging enthusiasm, infused with humour and shrewd mother-wit.

The great thing to be seen was, of course, the Castle, and we made for it, noting many objects of interest by the way, the pious inscriptions on ancient houses, Darnley House, which was the nursery of James VI.; the Market Cross, with its quaint old coats-of-arms; and "Mar's Work," a town-house built by an Earl of Mar just after the Reformation, in the construction of which a great deal of discarded carving from ruined ecclesiastical buildings was employed. Popular feeling was against this sacrilege, and the Earl having, as the Provost put it, "the dangerous gift of verse," had this couplet cut on one of the stones :—

I pray all lvkaris on this lvging
With gentil e to gif mair ivging.

This pacific advice was not apparently taken, for next he wrote :—

The moir I stand on oppin hitht
My favltis moir svbject ar to sitht.

This candid confession did not disarm criticism, however, and the builder added a final couplet much in the style of the flouting motto, "They say; what say they? Let them say." The Earl did not live to inhabit the house, and it was never completed.

Another inscription in Baker Street deserves notice. It runs thus :—

Heir I forbear
My Name or Arms to Fix,
Least I or myne
Shd sell these stones and sticks.

The point of this lies in the fact that the next house has an elaborate coat-of-arms displayed on its front. Doubtless "the pride that apes humility" was not unknown in these olden days, though it must be admitted that the philosophic burgher scores now. Many people visit Stirling Castle on sight-seeing intent, but few have the opportunity of seeing it as we did. By the kind permission of Colonel Nightingale we were enabled to visit portions of the Castle not accessible to the ordinary tourist, and had a magnificent outlook from the most commanding points over fifty miles of country rich in historical associations. From the Queen's look-out—where V.R. and a date cut in the stone show that Her Majesty visited the spot on her first visit to Scotland in 1842—we gazed westwards over a scene of surpassing beauty. Nearest the eye were "the varied realms of fair Menteith," backed by the mountain peaks which sentinel the Trossachs. Beyond Ben Lomond's cloud-capped peak we could dimly discern the giant outlines of the more distant hills, the "Cobbler" at the head of Loch Long. From Queen Mary's look-out we looked down on the precipitous side of the Castle rock, and on the old royal gardens—on the site, too, where jousts and tourneys were held in the merry days of old beneath the eyes of the Queen of Beauty. And ascending to yet a greater altitude, by way of an apartment now used as officers' quarters, known as Queen Mary's room, we got out by a trap door on to a central tower from which a complete panoramic view was to be had, from the Lomond hills in the east, "baring their virgin bosoms to the sky," to the western horizon with its rocky ramparts, Bannockburn with its flagstaff glittering against the trees, the Abbey Craig crowned by its national memorial, and the winding links of Forth, where, according to the old belief, the river spells out its own name in its erratic curves, passing through land so fertile that it used to be said, "A link o' the Forth's worth an Earldom o' the North." All this we saw, and more—the grey old town nestling under the protecting shadow of the Castle, the soldiers at work or at play within its walls, but we had to hurry on to the many interesting things still awaiting us.

Passing through the cemetery, where there are a number of quaint inscriptions, many military memorials, and monuments to covenanting martyrs, including the Wigtown martyrs, we came to the indicator, an ingenious contrivance by means of which you can easily identify any outstanding feature of the surrounding country. On a dial set on a pedestal is painted a panoramic view of the landscape, the outline of the hills being carefully followed, and accompanied by names, &c., so that the visitor has only to consult it in order to get full information regarding what he is looking at. A more efficient way of teaching the geography of a district could not be imagined. From this, which is planted on a height in one corner of the cemetery, we passed to the city churches, where we were taken in hand by Treasurer Ronald, a learned and enthusiastic antiquarian, who traced the history of the buildings and detailed vicissitudes through which they had passed in the most interesting way. We visited the Guildhall, too, and here the Dean of Guild was good enough to show us the gold ring set with jewels which was presented by David of Scotland to a far-off predecessor in office, and which had been handed down for so many hundreds of years from dignitary to dignitary. It is a large circlet of bright yellow gold, probably intended to be worn on the thumb, and bears an inscription in quaint old Scotch. We looked in at the High School in passing, and went over Allan's School, admiring the arrangements of both. By this time we were not indisposed to turn in for lunch, sight-seeing being proverbially a hungry business. After giving this item due attention, we went to see the fine new Public Hall and the Smith Institute, where there is a collection of pictures by celebrated artists—John Philip, Sam Bough, M'Taggart, &c.—as well as a museum, reading-room, &c.

In the afternoon our principal excursion was to the Wallace Monument on the Abbey Craig, which was reached by tramcar to Causewayhead, whence a quarter of an hour's walk took us to the monument. Here again a noble prospect met the view far as eye could reach, the course of the Forth being visible for many a mile, until the river broadened out into the Firth. Unhappily, a haze hid the great Bridge and the hills to the east. The Hall of Heroes is now nearly furnished, only two busts being wanted to complete the circle. Knox and George Buchanan, Dr. Chalmers and Adam Smith, Scott and Burns, James Watt and Livingstone, Tannahill and Hugh Miller and Robert the Bruce are the representative Scotchmen whose effigies adorn the hall, a goodly list of geniuses of different moulds—poets, writers, divines, philosophers, inventors, travellers, headed by the patriot King of Scotland—whose names are worthy to be had in everlasting remembrance.

Many more interesting things were crowded into this most interesting day; but "time, who steals our years away, steals our pleasures too," and it was but all too soon when we found ourselves at the station again on the way for home. A lovely sunset with great stormy masses of cloud piled on the western horizon delighted our eyes as we rolled northwards, and we glided into Perth in the tender gloaming with the stars coming out in the darkening sky. Here we parted with our Blairgowrie contingent, and a rattling run of twenty-five minutes soon brought us to Dundee, where we separated with mutual felicitations on the splendid day's outing we had had, pleasant memories from kind Stirling friends who had done so much to make our visit a success, and blithe wishes for our next merry meeting.

LANDLORDS AND LEASES.

IN continuation of the letter published last week from Mr. C. Thorp, Mr. Sextus Dyball, F.S.I., writes to the editor of the *Times* :—

The stringent lines upon which leases are now drawn may account in a great measure for the weighty feeling of dissatisfaction that has sprung up between landlord and tenant, as expressed in the correspondence which has been proceeding in your columns on the subject of insanitary houses. During an experience of forty years as a surveyor, my practice has to a large extent lain in the assessment and settlement of claims for dilapidations—*e.g.* the amount payable by a tenant to his landlord on the expiration of a lease in respect of repairs which he (the tenant) has during his holding failed to execute in accordance with certain covenants in the lease. Consequently a considerable number of leases relating to all varieties of property pass annually through my hands, and I am becoming more and more struck with the increasing one-sidedness of the covenants in favour of the landlord. The equitable construction of the law of dilapidations is to guarantee the landlord against any injury committed or permitted by the tenant, whether by neglect or otherwise, beyond reasonable use and wear; and my experience is that landlords were formerly satisfied with a general covenant, on the part of the tenant, upon these lines. But latterly it has become the custom to introduce into repairing leases exceedingly stringent covenants in favour of the landlord, which, unless interpreted in an equitable spirit, may and notoriously do afford a pretext for great injustice and extortion. I have now before me a draft lease for a term of twenty-one years (determinable at the end of the fifth, seventh or fourteenth years) of a house and stable in the West-end, upon which I have been consulted by a proposed tenant, and from which—in support of my contention—I will give some extracts. After making the tenant liable to pay and discharge all rates, taxes, charges, duties, assessments and outgoings — Parliamentary, parochial or otherwise—now or hereafter charged upon or affecting the demised premises, or the landlord or tenant in respect thereof (except the landlord's property-tax), the covenants bind him (the tenant) during the term to keep, and at the end to surrender, the premises in good and substantial repair, order and condition, to paint the outside stucco and cement work, and to paint, grain and varnish all the external wood and ironwork within the last three months of the fourth, seventh, eleventh, fourteenth, eighteenth and twenty-first years of the term; and to paint, paper, colour, flat, grain, marble, gild, varnish, decorate and French polish the inside during the last three months of the fifth (if the lease be determined at the end of that year) or otherwise of the seventh, fourteenth and twenty-first year, the whole to be done in the best manner, in appropriate colours and patterns, the outside paint with not less than two coats, and the inside with not less than three coats. On writing to the landlord to the effect that I considered these covenants unreasonable at the rack-rental demanded—viz. 400*l.* per annum—and that I could not advise my client to agree to them, he replies :—"I cannot admit that the covenants of the proposed lease are unreasonable, seeing that I have over a hundred similar ones now in existence. . . . The terms, however, can be altered, if desired, and the rent increased to relieve the tenant of certain outgoings"—a suggestion which amounts to no more than a transfer of the liability, as it were, from one hand to the other. A tenant at rack-rent is entitled to the fair and reasonable use and occupation of the premises, and he should not be held liable to execute repairs beyond such as are necessary for the upholding and maintenance of the fabric or for the making good of damage occasioned by neglect or misuse on his own part. The liability of a tenant was originally never meant to extend to the work of purely decorative and ornamental character, which is now so generally called for under the specific covenants of leases, and it seems to me that, in a great measure, tenants have only themselves to thank for the addition. Of course, a lease, as soon as it is executed—no matter how stringent or exacting the covenants may be—constitutes a hard and fast contract, which, like the drains that were said to be all right, will in all probability—so far as the interest of the tenant is concerned—prove to be all wrong. At this season of the

year, when so many properties are changing hands and new leases are being drawn, it is of the utmost importance for tenants to protect themselves against such excessive liability as the draft lease from which I have quoted seeks to impose, and which, apart from the manifest unfairness of the covenants, might lead to serious legal complications, if, by reason of illness or other cause, the tenant were unfortunate enough to lay himself open to an action for breach of covenant in not having at the stipulated period performed the repairs specifically provided for.

Mr. A. Moore, F.S.I., writes:—The letter of your correspondent Mr. Dyball seems to be written entirely in the interest of the tenant, and I should hesitate as a landlord to entrust him with a claim for dilapidations, unless assured that he could view the business from the other side, and which, no doubt, he would do with the positions reversed. A bargain for a lease is a purely commercial transaction; repairing covenants are well understood and form part of the bargain. The leaseholder having all the advantages likely to accrue from the property increasing in value as time goes on, is it unreasonable that he shall take upon himself concurrent responsibilities? A tenant taking a repairing lease expects and exacts that the premises shall be handed to him in a perfect state of constructive and decorative repair, and it is the province of his surveyor to see that this is done. It is the work of his solicitor to see that the covenants are fair and in accordance with the preliminary agreement between the parties. Of course it may happen that a tenant accepts a repairing lease of a dilapidated property, but this is quite a matter of bargain, of which the amount of rental forms a part. It is my experience that leaseholders at the termination of their tenancies are quite as anxious to avoid as landlords are to exact performance of repairing covenants, and it frequently happens that a lessor is landed with a dilapidated property from a bankrupt and destructive tenant. The dictum of *caveat emptor* applies in this as in all other bargains.

Another F.S.I. says:—The statement made by Mr. Dyball that "latterly it has become the custom to introduce into repairing leases exceedingly stringent covenants in favour of the landlord," will cause much surprise to owners, surveyors, and others conversant with house property in London. The growing tendency of the age is to rebel against the very principle of repairing leases, and a more correct view of the situation appears to be this—that tenants are becoming more and more exacting in their requirements, insisting on the hundred and one decorative and other luxuries that science and art, goaded by competition, afford, and that landlords are struggling, with ever-increasing difficulty, to maintain house property as a source of income. Speaking generally, they are fighting, in fact, a losing battle. The dilapidation question is almost always settled by payment of a sum in lieu thereof, agreed upon by two surveyors, respectively representing the landlord and tenant. Whatever this sum may be—say, for example, 100*l.*—the grasping landlord usually finds that he has to expend 150*l.* or 200*l.* before he can again let his house on a repairing lease, with necessary loss of rent during the process of repairs. The principle governing dilapidations is a simple and just one. An equitable basis of rent having once been arrived at, the landlord asks the tenant to give him back his house in the same state as it is delivered over. Sometimes a tenant is content to accept his dwelling with little or no outlay, though, more or less, it needs repair. The landlord modifies his covenants to meet the case. If, on the other hand, it be demanded, *inter alia* (and this is much more usual), that the inside be painted, papered, coloured, flatted, grained, marbled, gilded, varnished, decorated and French polished, "Certainly," says the landlord, "but kindly return it to me in the same condition. The rental I have agreed to accept is calculated, as you must, or should, be aware, upon this understanding." Permit me to point out one fertile source of grievance and practical injustice to house occupiers, though they themselves are to blame. Frequently, from sheer ignorance of their liabilities, they sign leases without giving any heed to essential conditions of the structure they are about to occupy. Thus, quite recently, it was sought to make a yearly tenant, terminating his holding in less than two years, responsible for extensive settlements and crackings of party and other walls, and repointing of hundreds of feet of terrace brickwork, the slow result of a quarter of a century's neglect. This condition of things can be most easily obviated. A "schedule of defects," prepared by a competent surveyor, should form an integral part of every lease or agreement. This simple process would cost tenants less in shillings than it now frequently does in pounds sterling.

H. T. P. says:—Mr. Sextus Dyball inveighs against the repairing covenants in modern leases; at the same time he does not relish the idea of increased rent and weak covenants. What does he want a landlord to do? Does he want him to let his house at less than the market value? Why should a landlord be debarred from the right, common to all men, of getting the utmost price for parting with property—the landlord parts with it for a term, at all events? I relet a house in November 1888, at 200*l.* per annum for four years and 225*l.* per annum for three years more, which when I bought it in 1881 was let at 275*l.* per annum, although only estimated to be worth 265*l.* I gave 4,400*l.* for it leasehold for 69 years at 2*l.* per annum. In repairing it and redraining it I spent on contractors 905*l.*, besides professional expenses. Though the house is let on repairing lease, my return from a wasting interest is not enormous. Surely some good fairy in the shape of a landlord's edition of Mr. Dyball should step in and induce my tenant, notwithstanding the lease, to pay me a rent which shall be a fair return on my capital, or else I ought in good times to have the right of getting the utmost I can for my property. I ought to add that the original lessee on determining his lease paid me 250*l.* as dilapidations and four months' rent beyond the date at which he gave me up possession. By all means let tenants kick at strong covenants in draft leases, but just as landlords find that competition regulates the market, the tenants will discover that the landlord will get his market value, whether with moderate rent and strong covenants or an increased rent and weak covenants, and that notwithstanding Mr. Dyball.

THE LATE SIR JOHN STEELL, R.S.A.

WITHIN a few weeks after the death of Sir William Fettes Douglas, the Royal Scottish Academy has to mourn, says the *Scotsman*, the loss of another of its most distinguished members. At the ripe age of eighty-six, Sir John Steell, sculptor to Her Majesty for Scotland, has passed away, leaving behind him the record of a life-work of great achievements in the domain of art which entitles him to the esteem and admiration of every patriotic Scotsman. For the past ten or twelve years he has lived in complete retirement, and latterly his health has broken down so seriously that he was confined almost entirely to bed. But his mind was healthful and vigorous to the last; and though the infirmities of age had reduced and weakened his bodily frame, his intellectual activity remained unimpaired till within a very few hours of his death, which occurred between six and seven o'clock on the morning of the 15th inst. By his removal Scotland has lost an artist of whom she had just reason to be proud, not only because of his acknowledged talent, but also on account of the devotion he showed for his native country, when he withstood all the inducements which the larger opportunities of winning fame and fortune in London held out to him.

Born in Aberdeen in 1804, the son of a carver and gilder, Steell owed much of his later success in life to the assiduous care and promptings of his father. He was no more than a year old when his family removed to Edinburgh, and there his taste for art was cultivated in boyhood, and was displayed in designs which astonished all who saw them. Of this early evinced taste a schoolfellow—Judge Anderson—wrote from the West Indies when Steell was distinguished in the world of art:—"From contemporary circumstances, and comparing notes of our ages, it must have been about the year 1812, when you were about eight and I about ten years of age, we and your sisters used to play children's games together, our parents' houses being on the steep road ascending to the Calton Hill. You were a delicate-looking, gentle-spirited little fellow, and wore a little round jacket. The 'plainstanes' or foot-pavement was, as usual then with boys, a favourite place of amusement with our spinning-tops. I remember one day when you greatly surprised me by drawing with a piece of chalk (by what appeared to me two or three strokes dashed off without the least apparent trouble) a figure of a galloping horse of a large size, so entirely different from and exceeding in point of character and excellence anything that children ever did that it greatly impressed me then, and I never afterwards forgot it. When from time to time I saw your name and the important works you had been called upon to execute, I always thought of the picture of the horse on the 'plainstanes.'" Failing to obtain in Scotland the art education he sought, Steell spent several years studying at Rome, where he made many designs—some of which he afterwards matured and executed—and where high encomiums were lavished on his work by his Italian friends and masters. He returned to Scotland in 1833, and established a studio in Edinburgh, where shortly afterwards he executed a group of *Alexander taming Bucephalus*, which at once brought him into public notice, and procured for him a special award of 50*l.* from the Board of Manufactures, by the members of which the design was greatly admired. The group was reproduced times without number, and Steell was permitted the rare honour of exhibiting his work for six weeks in the galleries of the Board. Sir Francis Chantrey was so struck with the group that he urged Mr. Steell to remove his studio at once to London, where he assured him of success and promised him personal aid. Largely from a desire to devote himself to the promotion and improvement of art in his native country, these inducements were resisted, a circumstance all the more to be admired when it is remembered that several prominent Scottish artists on

account of the favourable reception accorded to their works, had removed to the metropolis about this time.

The fame of his *Alexander and Bucephalus* group led to a commission for a colossal statue of the Queen, which now adorns the front of the Royal Institution. Another high honour was awarded him. After the death of Sir Walter Scott, in the competition for his monument the design of Mr. Steell for the statue was at first unanimously approved, and after much stormy altercation on the part of Chantrey and others selected by the committee to occupy the pedestal covered by the monument designed by Kemp. This was the first marble statue commissioned to be executed in Scotland, though a statue of Provost Blaikie for Aberdeen, subsequently ordered from Mr. Steell, was the first finished. Among the pamphlets published in connection with the Scott Monument discussion was a letter by Dr. Memes, the biographer of Canova, and author of a treatise on painting, sculpture and architecture, &c., and at its close, speaking of Mr. Steell, he says :—"I have made the history and the principles of art the study of many years. This has led me to converse much with artists, and a deeper and nobler enthusiasm than yours, a more simple or manlier perception of art, a more steady or sincere devotion in the pursuit of excellence, it has never been my chance to meet." This is high praise from one learned and deferred to on the subject of art. After the statue of Scott, other important commissions quickly followed—among others that of the colossal equestrian statue of the Duke of Wellington in front of the Register House, for which he received sittings at Walmer Castle, the Iron Duke even mounting his charger that the sculptor might more accurately represent his seat in the saddle. A bust was modelled for the group, and so highly pleased was the Duke with it that he ordered two copies for himself. Describing the unveiling ceremony on June 21, 1852, Lord Cockburn in his Memorials writes :—"The ceremony was striking, from the masses of people perched on all our pinnacles, horse and foot soldiers, of whom the most interesting was a band of Waterloo pensioners ; sundry processing bodies, chiefly those grotesque masons, and various lady-filled scaffolds. The cheers when the canvas dropped and disclosed the statue—running from the near to the distant streets, and ascending to the summit of the Calton, to the top of Scott's monument, to the tower of St. Giles, and prolonged on innumerable picturesque heights—were very fine ; and before they had ceased the guns of the castle roared ; and scarcely had they done their best when the inspired thunder rolled also, and left us to disperse in silence and under a short torrent of rain. Some think that it is more a statue of a horse than of a man—a great mistake, but not an unnatural one, from the man being only visible above the horse in high action. I went twice to see it next day, and of all the groups of gazers I scarcely observed one person talking to his neighbours. This silence was the deepest homage. It is certainly a noble work. Is there a better modern statue of the heroic order in Europe? We are all proud of Steell, a son of Edinburgh."

Steell's principal work, however, is acknowledged to be the national memorial to the Prince Consort, which occupies a conspicuous position in the centre of Charlotte Square Gardens. The inauguration of this statue by Her Majesty the Queen, in August 1876, excited the greatest enthusiasm throughout the country, the sculptor on the evening of the ceremony receiving the honour of knighthood in Holyrood Palace. Among other notable statues which came from his studio may be mentioned those of Lord de Saumarez, commissioned by Sir Robert Peel for Greenwich Hospital ; of Lord Jeffrey, Lord Melville, Lord President Boyle, Professor Wilson (Christopher North), Allan Ramsay, the poet ; George Kinloch, of Dundee ; the Earl of Shrewsbury and Dr. Chalmers. A bust of Dr. Chalmers, executed by Steell, called forth the following eulogy from Dr. Brown :—"Steell's is a noble bust—has a stern, heroic expression and pathetic beauty about it, and from wanting colour and shadow and the eyes, it relies upon a certain simplicity and grandeur ; in this it completely succeeds—the mouth is handled with extraordinary subtlety and sweetness, and the hair hangs over that huge brow like a glorious cloud. We think this head of Dr. Chalmers the artist's greatest bust." Steell also executed busts of the Queen, the Prince of Wales, the Duke of Edinburgh, Sir Robert Peel, De Quincey (the "Opium Eater"), of Florence Nightingale, Professor Edward Forbes, the naturalist; Professor Jamieson, Lady Susan Bourke, Lord Cockburn, Lord Fullerton, Lord Colonsay, Sir John and Lady Emma Macneil, David Scott, the painter ; the Marchioness of Lothian, the Duchess of Buccleuch, Lady Stirling Maxwell, Dr. Guthrie and many others. He has also executed statues of Lord Dalhousie and James Wilson, the financier, for Calcutta ; of Lady Elgin, for Jamaica ; and a colossal statue of Burns for New York, for which city he also executed a replica of Sir Walter Scott. A large number of the busts of eminent lawyers, which adorn the Parliament Hall, have come from Sir John's studio, as have also many monumental works, among which may be particularised those to the memory of the 42nd Highlanders erected in Dunkeld Cathedral, to the 93rd in Glasgow Cathedral, to the 78th in St. Giles and to the 4th in Carlisle ; to Lord Balgonie, Dr. Alison, the author of the "Essay on Taste" ; and to the Duke of Athole at Blair. The figures over the Standard Assurance Office, illustrating the parable of the ten virgins—repeated and enlarged for the office in Dublin—and those in the large tympanum of the Bank at Montreal, descriptive of the history of commerce, were executed by him. Sir John, who was a member of the Royal Scottish Academy from 1830, joined the body in that year from the Royal Institution, with which he was originally associated. Some time later he was appointed sculptor to the Queen for Scotland, and was elected to the Board of Manufactures, of which he was the oldest member. He introduced bronze-casting into Scotland, building at great expense a foundry of his own, which he made available for casting the works of other artists. A few years ago his studio was sold, but he did not altogether relinquish work. With the exception, however, of the bust of a lady in marble, shown at the annual exhibition of the Royal Scottish Academy in 1889, he has done nothing for the past ten years which has reached the public. Latterly he was in receipt of a grant of 100*l.* per annum from the Civil Pension List. Sir John was one of the most amiable of men, and one of the most genial of companions. His manner was that of a fine old gentleman who would scorn to do anything that might wound the feelings of those with whom he came in contact. His considerateness in this respect might almost be said at times to have become a weakness. It seemed as if he wanted the courage to refuse to comply with requests that were certainly not for his personal advantage, and it may be that now and then this easiness of disposition was abused, but, none the less, it endeared him greatly to all those who had the good fortune to make his acquaintance. His friends were numerous, and he deserved the friendships he enjoyed.

Sir John, whose wife predeceased him by several years, leaves two sons and a daughter. One of his sons is a consulting physician in Manchester, and the other an architect in Edinburgh. Mr. Gourlay Steell, R.S.A., animal painter to Her Majesty for Scotland, is a brother of the deceased.

THE CHICAGO EXHIBITION.

AT the opening of the National Columbian Commission on the 4th inst. a communication from President Baker, of the local World's Fair Corporation, asking the co-operation of the National Commission in securing a loan of 5,000,000 dols. from the Government for the use of the fair, to be repaid out of the first receipts, and a resolution of the Executive Committee of the Commission endorsing the request, were read and referred to the Committee on Judiciary.

Commissioner Towsley, of Minnesota, presented a resolution to the effect that the resolution heretofore passed for the appointment of a committee to recommend certain modifications of the tariff law in the interests of the exposition, be reconsidered and expunged from the minutes. Mr. Towsley said that rules of the Treasury Department provided for the whole work which it was proposed for the committee to do in the matter of the admission of goods intended for exhibition at the fair. This action of the Commission, he said, was liable to misconstruction ; it had been publicly misconstrued as an attack by the Commission on the new tariff law. Furthermore, it would put the Commission at odds with Congress, and would interfere with its work in securing the proposed 5,000,000 dols. loan for the fair.

Commissioner Harris, of Virginia, the author of the resolution which it was proposed to rescind, said the resolution was not aimed at the new tariff law ; it would apply alike to the old tariff law or to the mills had it become a law. The resolution was entirely non-political ; its object was merely to relieve foreign exhibitors of unjust burdens.

After a long discussion the resolution for the appointment of a committee was reconsidered by a vote of 32 yeas to 23 nays, and it was referred to the Committee on Legislation after Commissioner Waller, of Connecticut, had made a speech deprecating the political turn which the matter had taken in the public press and in the Commission. He declared that no politics was thought of when the resolution was passed, and said that when the Democrats got ready to fight the new Tariff Law it would be done openly, not under cover of an insignificant resolution.

A resolution pledging the Commission to take up and consider the Sunday closing question as soon as it should properly come before that body was unanimously passed.

The Auditing Committee presented its report, showing an estimated excess of expenses by the Commission for the year ending July 1 next over the appropriation of 23,000 dols. In order to avoid this the committee recommended that the April meeting of Commission be postponed till July ; that the pay-roll of director-general be reduced by 3,000 dols. ; that the salaries of 5,000 dols. each of the president of the Commission and the vice-chairman of the Executive Committee be discontinued after October 1.

Vice-Chairman McKenzie, of Kentucky, said that the report seemed to be aimed at him in order to eliminate him from the Commission. This was unnecessary, as in his own good time he would eliminate himself. The whole trouble was that he had refused to sanction a report of the Finance Committee which he had not had an opportunity to see.

LINCOLN MUNICIPAL BUILDINGS.

AT last week's meeting of the Lincoln Council the subject of new civic buildings on the site acquired for the purpose was again discussed. It was proposed to advertise for plans from architects, the competition to be an open one, and sketch plans to be in the first instance furnished, also to select from such competition say three sets of plans, the same to be submitted to the whole Council in committee. An architect, as assessor, to be appointed in the first instance, his name being announced in the advertisement, and the above and other details to be submitted to him for approval before the same were acted upon. The following amendment was proposed:—"Before finally committing the Council to the Silver Street site, plans to be obtained for municipal offices, police, fire brigade, weights and measures, on the Sessions House site, in addition to the plans for the buildings on the Silver Street site, together with estimates of the cost of the whole scheme and of such portions of the scheme as are now absolutely required." A discussion followed, in the course of which one councillor said the Sessions House site had been before the Council on many occasions, and been rejected, and the Silver Street site had been approved. The minority ought to let the thing go forward. As for the suggestion that two sets of plans should be prepared when only one scheme would finally be accepted, it seemed to him that the impression must be that architects kept their offices open for the public good, and had nothing to do but prepare plans for any amount of buildings which would never be required. They would not get good architects to compete under such terms unless they offered them each a sufficient sum of money for the plans. Otherwise they would not send in plans for a building which would not be erected, and upon which there would be no chance of the successful competitor receiving the usual commission. He had before suggested that the Sessions House site was a magnificent one for schools and a free library and a museum, and they might also have reception-rooms for the Mayor in connection with any such buildings that might be erected there. The amendment was carried by a majority of one vote.

MONT ST. MICHEL.

"SWITZERLAND is fly-blown!" said one of our famous preachers the other day. What scornful epigram would he not swing at Mont St. Michel? From the arched lime avenue at Avranches, says a correspondent of the *Manchester Guardian*, the stranger sees its dark peak jutting out romantically from yellow sands, but as he draws nearer to the place his most vivid impression is of the hotel tout. A rabble of screaming women assail him at the very gate of the town, and he feels threatened like Pantheus by these advertising Bacchanals. The mediæval town lies huddled between the ruddy bastion of the outer wall and the steep face of naked rock. Its one crooked street, which climbs painfully along the escarpment of the lower cliff, is gay with the cheap frippery of a seaside bazaar. Mendicants display mutilated extremities to catch the *sous* of the tender-hearted tripper. "At the sign of the renowned omelette" stands the clever, buxom hostess, the Seiler of Mont St. Michel, her house adorned with the sketches of a hundred artists who have been her guests. High up the rock, house above house flaunts its connection with the hotel below, and angry placards guard you against fraudulent impersonations of the famous innkeeper. But the traveller hardly needs the warning. For him Mont St. Michel has but one inn and one hostess. "Quis ut Deus?" was the legend emblazoned on the banner of the mediæval pilgrim to St. Michel's shrine. But the motto of the modern tourist runs—"Quis ut Madame Poulard?"

You ascend the narrow ramparts, and catch the sharp salt smell of the nets spread along the battlements by the shaggy, barefooted fisher-folk. At your feet are the crowded purlieus of the town; above you rises the great mass of building, crested with flying buttresses and jutting pinnacles. The precipitous walls rise sheer from the town, but are fringed at their seaward base with ash, ivy and poplar growing down to the roots of the reddish rock, which is stained with black and yellow lichen. On inaccessible fragments of ruin flowers the wild-pink. To seaward, as far as eye can reach, you are ringed round with leagues of grey sand, white with a distant drift of gulls. Across the heavy sands a tiny cart crawls like a black fly, its horses splashing through the shallows. Suddenly the yeasty current of the tide coils in from the azure strip of sea on the horizon and quickly covers the nearer flats with a rippling wash of muddy water, while the birch-capped beacons sharply mark the treacherous channel and the deeper stream. Monastery, centre of knighthood, State prison, common gaol—the massive pile of masonry begins once again, almost against your will, to impress you by its ancient associations of faith, chivalry and crime. You find yourself forgetting the tripper, though his strident gabble is still resonant in the galleries above, and the chaffering of the trinket sellers rises from the steep street below. For them, at any rate, articles of faith seem less profitable than *articles de Paris*. The stream of trippers carries you forward to the grim entrance of the castle, and up through its sombre courts and vaulted corridors you climb to the dizzy level on which stands the ancient nave of the Benedictine church, perched on the very apex of the rock and red with repeated fires. As the custodian reels off his recitative, standing in the granite apse, which rests on twenty columns concealed in the crypt below, two amorous trippers scribble their names on an inviting door. Still higher the merry crowd hurries up the winding stair, and shouts with glee as it troops out on the highest platform, peaked with granite pinnacles, which in winter storms the wind snaps off like the icing of a bride's cake. Here you would fain linger with the world spread at your feet, but the trippers hurry you forward through the cloister, of Sicilian elegance but disfigured by a crude roof of new zigzag tiling. Poking its carving with their parasols, the trippers press into the dormitory, matchless in its spacious beauty, down again into the pilgrims' dining-hall and the chamber of knights, down still further to the vast cellars which form the base of the stupendous pile, built, like the great church of Assisi, in the age of faith, and justly honoured as "the marvel of its time." The "wonder of the thirteenth century" has become the museum and raree show of our own.

Still further down into the rock the crowd hurries to see the dismal dungeons. In one dark cell, three paces by two, its only air-hole an iron grid opening on a vaulted passage, the manacles still remain and clank as the adventurous tripper tries their weight. The cigarette of a French cyclist, wearing the jockey cap of his sport, and the bird's-eye of a British tourist mix an ironical perfume with the stuffy air of these dreary prisons. But even the holiday crowd stands horror-struck before the shallow arch in which once stood the cramped iron cage of the journalist condemned by Louis XIV. to crouch there in expiation of some affront. In the growing dusk the mildewed walls look grisly and grim, and on our leaving the castle we find that the night has fallen. The town is hushed. The last car rumbles off along the new breakwater with its burden for the train. In the dark mass of masonry above us one little window alone is ruddy with some custodian's fire. Far below, lanterns carried along the ramparts fitfully light up the battlements. The spell of the place falls on all who remain. At nightfall the thirteenth-century triumphs once again over the tripper in La Manche even as in Umbria. For Mont St. Michel, in spite of its touch of Blackpool, is still the Assisi of Northern Europe.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

THE SKEW BRIDGE AT RIMINI.

IT is generally supposed that oblique or skew arches originated in the necessity of carrying railways across public and private roads, rivers, &c., which could not be diverted. The bridge constructed in 1830 over the Gaunless river in the North of England is considered to be one of the early examples. Readers of Vasari's "Lives" will, however, remember that in the account of Niccolò, known as Tribolo, the son of the carpenter Raffaelo, of Florence, a description is given of a skew bridge which was one among many remarkable works of that ingenious architect. The passage is thus translated in Bohn's edition:—"The Signor Duke (Cosimo de' Medici) caused Tribolo to build a bridge over the Magnone, at a short distance without the Gate of San Gallo, where that river crosses the high road which leads to Bologna, and the arch of this bridge, seeing that the river crosses the road in a diagonal line, Tribolo constructed in a similar direction, which was then a new thing and was much commended (*che fu cosa nuova e molto lodata*). The masonry of the stone arch was more particularly praised, being all worked in pieces, each piece having the proper degree of inclination from the square in every direction, and all were so admirably conformed that the bridge has proved to be a structure of great force, and has moreover a very

graceful aspect; this bridge is, in short, an exceedingly beautiful work."

In Italy an example of a still earlier oblique bridge could be seen by Tribolo in the sixteenth century, viz. the ancient Roman bridge over the Marecchia at Rimini. Tomaso Tamanza, long known as architect and engineer to the Venetian Republic, was sent about 1740 to report on this work, which must have been erected about the commencement of the first century. The inscriptions suggest the period to which the bridge belongs :—

IMP. CAESAR. DIVI. F. AVGVSTVS. PONTIFEX. MAXIM. COS. XIII. IMP. XX.
TRIBVNIC. POTESTAT. XXXVII. P. P.
DEDERE.

TI. CAESAR. DIVI. AVGVSTI. F. DIVI. IVLI. N. AVGVST. PONTIF. MAXIM.
COS. IV. IMP. VIII. TRIB. POTEST. XXII.

In the course of his description Temanza says, "The river Marecchia passes under the bridge by five large arches, and by a straight channel of a width about equal to the length of the bridge empties itself into the sea," at that time about one Italian mile from the bridge. "This channel makes almost a right angle in the direction of the lines B C on the plan with the line of the external face of the bridge next the seashore, and serves as a harbour, but only for very small vessels. . . . The mouth is inclined to the left, and there is on the other side a great bank of sand which is daily and visibly increasing. . . . Neither side of the piers makes a right angle with the external faces of the bridge, but is inclined in the direction of the lines B A towards Rimini, that is to the right, which according to my belief was done for some very sufficient reason."

Rimini stands on the right bank of the Marecchia, and there is on the left bank, just beyond the bridge, a suburb of some extent called Borgo San Guiliano, and formerly Borgo dei SS. Pietro e Paulo. The dimensions of the arches and piers, beginning from the left bank, are, in English feet and decimal parts, as follows :—

	Feet.		Feet.
First arch .	28·323	First pier .	13·229
Second do. .	28·829	Second do. .	14·509
Third, or centre .	34·329	Third do. .	14·446
Fourth do. .	29·018	Fourth do. .	13·434
Fifth do. .	26·031		

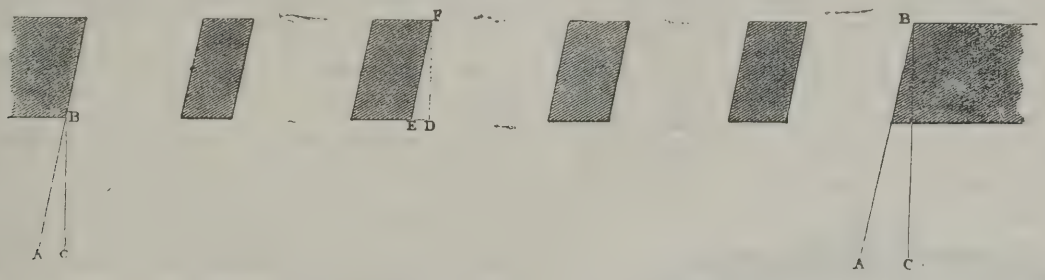
The distance D E, showing the inclination of the centre pier—and Temanza makes all alike—measures 4·781 feet, and the bridge from face to face, D F, 24·150 feet. The angles therefore of the sides of the piers with the faces of the bridge, instead of being 90°, are less than 79°, being 78° 48′ nearly. In the table the measures are calculated in English feet and decimal parts, taking the Venetian foot as equal to 1·138 English foot, the mean of two authorities I have referred to for the proportion.

Temanza continues :—"It will certainly not be easy to assign the true motive for this obliquity, neither, on the other hand, will it be difficult to say something on the point. No one can doubt that the piers of the bridge were inclined in the direction in which the Marecchia ran. It follows that it must be believed that the mouth of the river was in the direction of the piers; that is, towards the city. And, indeed, in the careful search that I made for proofs I was informed by Signor Giovanni Bianchi, professor of medicine in Rimini, who is well known in the republic of letters, that in some very ancient charters of the monastery of San Guiliano, the ancient bed of the river is often named as the boundary of property, a clear proof that it had formerly another direction."

On the motive for making the piers oblique, it may be added to the above that in a work published in Rome in 1768, without the author's name, under the title "Del Porto di Rimini: Lettera da un Riminese ad un Amico in Roma," giving an account of some operations then lately carried on for the improvement of the port, the first plate, being a plan of the river from just above the bridge to the sea, shows the direction of the river above, so far as it is given, to agree with that below, except that there is an elbow on the left bank immediately above the bridge, the river there taking a sudden turn towards the right, and so making the course of the stream at the bridge in the direction of the waterway under it. Unfortunately, the work relates entirely to the port, and there is, therefore, very little of the river above the bridge shown.

Temanza proceeds to point out various inaccuracies in Palladio's very brief description of the bridge, particularly in not showing the inclination of the piers, and in representing the three middle arches as equal, they being equal in height only, which, measured from the chord of the arch, is 18·302 English feet (Ven. feet 16 1′), and that of the other two 16·967 English feet (Ven. feet 14 10′ 11″), and he further observes that, in his own time, the bridge was visible only from the chord of the centre arch, everything below being buried in gravel.

"The wedges, or voussoirs, of the three middle arches are not less than Ven. feet 3 5′ high (English feet 3·888), and those of the two extreme arches, Ven. feet 2 7′ (English 2·939); they are single pieces of stone, much longer than they are high, . . . and throughout the vault as high as the external wedges. No wedge can weigh less than a thousand pounds, and many weigh two or three thousand pounds each. The art with which they are joined is admirable; their interior faces are exquisitely smoothed, and I observed that the workmen had taken much more care in working the interior parts than in smoothing the exterior. They fit each other so exactly that a hair could not pass between them. . . . Many of them are split, and many others have holes in them. In the former appear those iron bolts or nails used by the ancients to unite great stones; these are well covered with lead, but many have been badly provided with this protection, and so the rust occasioned by moisture, which will make its way through the closest joinings, has produced the mischief of these splittings. . . . Each wedge has three bolts or nails, one corresponding to the angle formed by the two external faces, and the other two are over the two ends of the same." ("Uno corrispondente all' angolo formato delle due faccie esterne, e gli altri due sono sopra l'una e l'altra estremità delle stesse.") "The interior parts are wholly without this fastening as having no need of it."



It may be asked how it has happened that the obliquity of the bridge has attracted and received so little notice; an answer will be found in the following passage :—"That on the side next the sea, which has the more handsome elevation, was so placed that it corresponded in just symmetry with the centre arch which was under it; not so, however, that on the other side next the mountain, for, by reason of the oblique direction of the piers and arches, it is out of just symmetry with the arch below, and is nearer to Rimini. This was done with excellent design that the two inscriptions should appear on the road over the bridge directly opposite to each other, and that thus the traveller should not discover the obliquity of the piers." The inscriptions are engraved on each side of the bridge, on the inner side of the parapet on portions of it raised above and projecting into the footways beyond the general lines, such portions being about 38 feet long, and placed opposite to each other. This design has succeeded, but it may perhaps be questionable whether other circumstances may not have contributed to cause the peculiarity of construction to escape notice.

The Arch of Triumph at Rimini has secured far more attention from travellers than the bridge over the river, and on that account it may not be amiss to notice so interesting an example of construction.

ELECTRIC LIGHTING OF LIVERPOOL DOCK WAREHOUSES.

THE Mersey Docks and Harbour Board has not shown itself remiss, says the *Liverpool Journal of Commerce*, in sanctioning schemes for the improvement of the efficiency of the docks. Within quite a recent period we have seen docks which were regarded as almost useless filled with vessels of the largest class, and the adjoining warehouses, which seemed destined to become mementoes, and expensive ones at that, of the method of handling freight of a bygone generation, have, under altered circumstances, assumed all their original importance, and are now filled with goods and serving the purposes for which they were

constructed. Among other imports, which, like cotton, are almost peculiar to Liverpool, is grain, and to accommodate this very important trade the Waterloo Grain Warehouses were erected some years ago. Although the methods of dealing with vast quantities of grain have naturally improved since then, these warehouses are still among the finest to be seen anywhere. Machinery, comprising elevators of the most approved type, has been erected, and while, we believe, steamers of the largest size cannot use the Waterloo Dock, yet sailing-ships and large cargo steamers can have their cargoes of 2,000 to 4,000 tons discharged in a very short time. Up to the present time work at the warehouses at night time has always been of an unsatisfactory character, owing to the absence of light. Exposed flames, such as gas-jets, in a warehouse used for grain are out of the question, as the grain dust, as distinguished from the earthy matter in the form of dust, which is the usual accompaniment of bulk grain, is very inflammable, and in fact behaves like fine coal dust, in that it is easily oxidised under proper conditions. Flexible tubes for conveying gas were also obviously objectionable. Consequently, when it has been necessary to work at night time, vegetable oil lamps enclosed in glass frames have been employed. Those who have had experience in stowing grain in bulk in a ship's hold will be able to form an idea of the amount of light which is obtained by these means, especially when the air is filled with floating grain dust. An ordinary oil lamp, when properly looked after, may yield about six or eight candle power. After a few hours this falls to four or five; interpose a medium of grain dust between the observer and the lamp, and the light emitted is reduced to almost nothing. All this, however, is now changed at the Waterloo Grain Warehouses, and a departure has been made which will doubtless be followed up. The electric light has been introduced, and from an inspection we should say that it will not only greatly facilitate the handling of grain, but will also conduce to the comfort of the workmen. The Waterloo Grain Warehouses consist of three blocks of buildings of the most massive possible construction, resembling somewhat in their solidity and proportions the works of the old Romans. This is, however, a well-known feature of the work of Mr. G. F. Lyster, the Dock Board engineer. Two blocks are 650 feet by 80 feet, and the third 180 feet by 80 feet. All have six floors; consequently the total floor area is nearly 80,000 square yards.

Correspondence

University College Classes.

SIR,—I shall be glad if you will permit me to draw the attention of your readers to the announcement which they will find in your advertising columns of new classes which it is proposed to open, with a view to improving and extending the instruction in architecture and in building construction in this college.

The liberality of the Carpenters' Company has provided funds which are to be appropriated to establishing an afternoon class for architectural and structural drawing and an evening class (also chiefly a drawing class) for instruction in building construction. The fees of both are to be very moderate, and each is to meet twice a week. A very competent demonstrator has undertaken the conduct of the classes under my personal supervision, with the assistance of Mr. Elsey Smith.

I hope that some architects who take pupils will arrange to send them to the afternoon class. One object proposed is to assist students in preparing the drawings required as "testimonies of study" for the Institute examination, and otherwise to prepare them for examination. The work, as far as practicable, will, however, take up the subjects dealt with in my courses of lectures in architecture and construction.

It has been arranged that students able to devote a session to the preparation desirable before entering the architectural profession can attend the classes most suitable for this purpose as a series, and can obtain a "composition ticket" at a reduced fee, admitting to the whole of them.

T. ROGER SMITH (Professor).

University College, London: September 22, 1891.

A. A. Education Scheme.

SIR,—Enclosed is a copy of a letter which I am sending to the President and Committee of the A. A., and which speaks for itself. If you would kindly publish it I should feel obliged.—Yours, &c.,

G. A. T. MIDDLETON.

42 Bolingbroke Grove, Wandsworth Common:
September 22, 1891.

To the President and Committee of the Architectural Association.

Gentlemen,—It has come to my knowledge that in one at least of the subjects of the A. A. Education Scheme a gentleman has been appointed instructor who was not one of the applicants, myself and any others who applied in accordance with the instructions issued by you being passed over without being either interviewed or informed as to your decision. I have no objection to make to the gentleman appointed, he being a personal friend of mine and a capable instructor; but I do protest against the manner of his appointment, as an act of injustice to myself and all others who applied in the regular way, and should be glad of an explanation. I am sending copies of this letter to the building papers.—Yours truly,

(Signed) G. A. T. MIDDLETON.

September 22, 1891.

GENERAL.

Monday, October 5, has been appointed for the reception of works of art intended for the autumn exhibition (the twenty-fifth) of the Nineteenth Century Art Society, at the Conduit Street Galleries.

The Private Collections of Rome contain the following number of works of art:—Borghese, 676; Barberini, 99; Colonna, 600; Corsini, 647; Doria, 793; Rospigliose, 124; Spada, 312; Villa Albani, 73 pictures and 1,042 pieces of sculpture; Villa Borghese, 422. The Farnesina Collection has not been properly counted.

Sir James Kitson has presented to the Art Gallery of Leeds Sir Frederick Leighton's picture, *The Return of Persephone.*

The Historical Art Museum in Vienna will be opened by the Emperor of Austria next month. It will contain collections that hitherto were scattered through the city.

Mr. Hamo Thornycroft's statue of John Bright, M.P., will be unveiled in Rochdale on October 24. It is 9 feet 6 inches high, and will be placed opposite the Town Hall. The sculptor proposed to show the orator trampling on a sword, but the committee objected.

An Exhibition of works by members of the Association of Artists belonging to Lorraine will be opened in Nancy on October 15.

Mr. William Morris will deliver an address at the opening of the exhibition of pre-Raphaelite and other paintings at the Corporation Art Gallery, Birmingham.

The Japanese Government will, it is said, spend a sum of 140,000*l.* in preparation for a display of Japanese work at the World's Fair at Chicago; 30,000*l.* will be on account of Government exhibits.

The Council of the Glasgow Institute of the Fine Arts contemplate holding in their galleries during November a select exhibition of art-work by amateurs, including painting, sculpture, wood-carving, embroidery, &c.

The Agent-General for Tasmania announces that artists wishing to show their pictures at the coming exhibition, which will be opened on November 25, must see that their works be delivered to the London agents, Messrs. Dicksee & Co., Rose and Crown Yard, King Street, S.W., before the 25th inst. Such works will be subject to the approval of the London committee, those selected being forwarded to Tasmania free of charge.

A Copy of Da Vinci's *Last Supper*, which is supposed to be the work of Andrea Solario, has been removed from the storehouse of the Brera to the refectory of Santa Maria delle Grazie, and placed near the original work.

The Dean of Manchester has received an offer of 500*l.* from Chancellor and Mrs. Christie for the erection of a pulpit in the nave of the cathedral. Their desire is to memorialise Mr. Christie's twenty years' tenure of his office as chancellor of the diocese.

The Annual Convention of the American Institute of Architects is to be held in Boston, October 28, 29 and 30, and the Boston Society of Architects and the Boston Architectural Club have united to organise, in connection with it, an Architectural Exhibition.

A Lutheran Church is to be erected in Speier from the designs of Herren Flügge & Nordmann, which will cost a million of marks. The style will be Gothic.

Mr. William Rowell, of the firm of Messrs. J. W. Rowell & Son, architects and surveyors, of Newton Abbot, has been appointed surveyor of ecclesiastical dilapidations, from among a large number of candidates, in the diocese of Exeter, for the deaneries of Totnes, Ipplepen, Moreton and Woodleigh. The office was rendered vacant by the death of Mr. R. C. Reade, M.A.

Professor D. E. Jones, of University College, Aberystwyth, has been appointed director of technical instruction for the county of Stafford.

The Plans for the proposed hospital for infectious diseases at Rowley have not met with the approval of the officers of the Local Government Board.

The Architect.

THE WEEK.

A letter has been sent by Messrs. Kirk & Randall to the School Board of London concerning what seems to be an undoubted grievance. On August 13 they received an intimation from the Board that they had been selected to tender for the erection of Kemsing Road School, Greenwich. The day following they replied that they would be pleased to submit a tender. They accordingly tendered on August 31 to carry out the work for 16,354*l.* Three days afterwards Messrs. Kirk & Randall received a letter informing them that the tender of Messrs. Lorden & Son had been accepted at 16,881*l.* In their last letter they ask why they have been passed over, and the work given to a firm whose price was 527*l.* in excess of theirs. The arrangement does not appear to be fair to them as contractors, nor satisfactory to them as ratepayers, and they ask that their letter may be placed before the Board at their next meeting. The protest has been referred to the Works Committee for consideration and report, and the explanation we hope will be satisfactory to all concerned.

M. Lavastre, who was one of the principal scene-painters of Paris, died in that city on Thursday in last week. His work for the Opera House, the Théâtre Français and the principal theatres was so important, in spite of its temporary purpose, that if he desired he might have been elected a member of the Académie des Beaux-Arts. But he was modest in valuing his pictures for the stage. M. Lavastre was the decorator of the domes of the exhibition building of 1889.

It is still possible to obtain works by painters who are favourites with the French at prices that are worthy of the London "Slaughter-House." The sale of the property of the late Madame Agar, the tragic actress, afforded one of those desirable chances. A small painting by Corot, an Italian landscape, was sold for 99 francs. A head of a young girl by the fashionable portraitist, M. Carolus Duran, brought only one-third the sum, or 33 francs. Millet's *Mother Martin and her Cow*, painted in 1861—the gem of the little collection—went for 607 francs. Once upon a time Rachel was the idol of Parisian playgoers, but not a sou was offered for her portrait, and it became necessary to add a batch of engravings in order to obtain a franc for the compound lots. The low prices may hereafter add to the interest of the paintings, and why should not Millet's *Mère Martin* one day be taken as equal to the *Angelus*, over which so much money has been expended?

As was anticipated, the Special Committee of the London County Council have not been able to prepare a report that will do much for the settlement of the question of water supply. An excuse is offered for the failure by suggesting that the committee were tied down by the House of Commons, and could not, therefore, act with the liberty that was necessary in such an investigation. They say that the Parliamentary Committee have hampered the action of the Council in the matter by the recommendation that the Council shall be obliged to purchase the undertakings of the water companies before they can place themselves in a position to deal effectually with this subject. And, further, the committee clearly incline to the opinion that a fresh supply will, or may be, necessary, and that London may have to go to Wales or to some distant region for such a supply. At the same time, they have declined to recommend the course best calculated to bring the question to an early settlement, and they leave the subject in a very unsatisfactory position. Their recommendation with respect to the future action of Parliament clearly points to the case of Birmingham, which is coming to Parliament next year with a scheme for appropriating one of the best remaining sources of supply in the country, namely, a mountainous district in Mid-Wales. This involves the Council in serious difficulties. To leave Birmingham unopposed may be to lose the chance of an excellent source of supply for London. To oppose Birmingham without any definite scheme for occupying the ground which Birmingham proposes to appropriate will be both invidious and difficult. All the committee of the London County Council can do is to propose the following resolutions:—1. That the Council, whilst expressing their readiness, so far as their legal powers enable them to do so, are prepared to undertake the duties and obligations mentioned in the 1st, 2nd, 4th, and 5th recommendations in paragraph five of the report of the Select Committee, but are unable to accept the condition contained in the 3rd recommendation, that the Council, if constituted the water authority, should be required to purchase the undertakings of the eight water companies "by agreement, or, failing agreement, by arbitration, within a fixed period." 2. That the Council are prepared to accept and act upon the following recommendation, contained in the report of Sir William Harcourt's Select Committee on Water-Supply, viz. "That for certain purposes at least it would be desirable to acquire the undertakings of the existing companies, if the same could be obtained on fair and reasonable terms." 3. That the Council are of opinion that the price to be given for the undertaking of any company should depend not merely on past dividends or on Stock Exchange values, but upon the true value of the undertaking, having regard to its legal position and liabilities, to the condition of the property, and to its ability to supply future wants. 4. That, in order to arrive at a satisfactory conclusion on this last question, it is essential before any terms of purchase can be considered, that the liabilities to capital expenditure for new or supplementary sources of supply in the immediate future should be authoritatively ascertained. Before all these problems can be satisfactorily settled, it is needless to say that every available source of supply in England will be appropriated. Birmingham need not be apprehensive of opposition.

The London School Board during the past year have erected five permanent schools, ten have been enlarged, and twelve temporary schools were opened, giving places for 12,167 children, but as two temporary schools, with places for 3,084 children, were closed, the net addition is more than 9,000 places to meet the growing wants of London. There are now 410 schools, divided into 381 departments for boys, 371 for girls, 382 for infants and 37 "mixed," for boys, girls and infants together. It is claimed by the Board that there are no better school buildings, no better apparatus, no better supervision, no better teachers, no better systems of instruction of pupil-teachers, and, judged by all the known methods of testing school work, no better results.

It is, we suppose, no more than natural that Englishmen and Germans, as they are out of favour with the French, should be supposed to furnish the thief who lately stole a Sèvres vase from the palace of Versailles. Accordingly, a demand is made to the Department of Buildings for more servitors, to whom will be assigned the duty of scrutinising English and German tourists as they leave palaces and buildings containing anything that is valuable and portable. The authorities probably are not led away by the theory of a foreign thief, and are likely to believe that the vase in question was carried off by somebody who was well acquainted with the place and with the hours when observation was not keen. There is no doubt, however, that at Versailles the lax control would be considered as affording temptation to anybody who is dishonest. The rooms forming the apartments, which are locked unless when an attendant accompanies a party, although communicating, do not always run in one direction. Some of the visitors can lag behind and become invisible to the attendant, whose mind is more likely to be engaged in speculating on the amount of his tips than in considering the danger to the public property. But the figures or vases are of a size that prevents their removal unless by a man or woman who was provided with special means of hiding the plunder. Nothing to be seen in the rooms could be carried in the pocket of any ordinary coat without exposure. It is, therefore, ridiculous to suppose that a stranger was the culprit in the robbery that has lately occurred. With all their defects, the ordinary English tourists have hitherto proved themselves to be honest, and as for the Germans they have chances enough in their own palaces. Sans Souci would by itself be a mine, for it abounds with relics on a miniature scale.

1851—1891.

THE interval taken by Scott when he wished to contrast the past with the present was one of sixty years. It is, however, possible to suggest great changes by means of a shorter period. At present we propose to offer a very few jottings, which, if they do not serve to indicate the transformations which have occurred during forty years, may at least recall the names of some men who were living in 1851, but are now among the dead.

The period in question is one that merits more attention than it has received. It is sometimes supposed by the younger generation that previous to 1851 there was not much English art that deserves remembrance. As regards fine art that is an error. The Hyde Park Exhibition did not advance painting or architecture, and its influence on sculpture was too slight to be calculated. It is only necessary to glance at the lists of members belonging to the various academies and societies of artists about 1851 to be convinced that there were great men in those days, and that many of them have not been surpassed by their successors.

It is remarkable that not one of the Royal Academicians of 1851 now forms part of the society. Mr. F. R. Pickersgill, who is on the retired list, was only an Associate in that year. Of two others who have withdrawn, Mr. W. C. Marshall was not elected until 1852, and Mr. Frith in 1853. Mr. Hook received full honours in 1860, Mr. Goodall in 1863, Mr. Horsley, Mr. Faed, and Sir J. Millais in 1864. Among the Associates of 1851 were Francis Grant, afterwards president; Sir John Watson Gordon, better known as president of the Scottish Academy; J. H. Foley, the sculptor; J. C. Hook, T. S. Cooper, T. Creswick, A. Elmore. Aartists whose names have been closely associated with the Academy were outsiders forty years ago. But there was no lack of talent within the Academy. Such painters as Turner, Mulready, Maclise, Stanfield, Edwin Landseer, Leslie, Roberts and Eastlake; sculptors such as Gibson, MacDowell and Baily; and architects of the standing of Barry, Cockerell, Hardwick and Smirke were enough to uphold the reputation of any academy of art, and to inspire the younger artists and students with emulation.

It was to be regretted that for the works of the Academicians and other artists no place could be found in Paxton's building. It was only as an exemplar of an exhibitor's colours that a vigorous figure painted by Mr. Armitage was admitted. It is true the space was limited enough, but it is not easy to understand an arrangement by which sculpture was tolerated on account of the bronze and marble, while painting was ignored. In subsequent international exhibitions a more reasonable and comprehensive classification was adopted.

Water-colour painting is a form of art that seems to need a placid disposition in the artist. Power over nerves may have much to do with the lengthened practice which members of the old Water-Colour Society have been able to enjoy. It is satisfactory to find that several members of the Society in 1851 are still able to produce excellent drawings, and we hope they may long continue to connect the art of two periods.

The new Society of Water-Colours, which was subsequently transformed into the Royal Institute, has not left many representatives, but we still have among us John Absolon, Edward Courbould, Charles Davison and Harrison Weir.

The quality of the Royal Hibernian Academy of 1851 has to be judged by a solitary Academician, who now serves art in another way than by producing beautiful drawings; we are referring to Sir Frederick Burton. In those days his work appeared with the landscapes of Petrie, in which inanimate nature became almost pathetic; the marine views of Kendrick, the portraits of Catterson Smith and Cregan, and the everyday scenes of Crowley and Rothwell. It was a time when people expected that painting was about to flourish in Ireland, but unfortunately it is at such periods a blight always appears which is destructive. And yet the Academy which possessed so many able members was founded as late as 1825, previous to which time there was no organisation of artists in Ireland.

The Royal Scottish Academy, which was a year younger, consisted in 1851 of a far larger number of excellent artists than the Irish institution. Among the members were Francis Grant, A.R.A., Robert Scott Lauder, Horatio Macculloch, Noel Paton, George Harvey, Colvin Smith, Daniel Macnee, John Houston, Thomas and John Faed, Alexander Fraser, painters; Lawrence Macdonald and John Steell, sculptors; Thomas Hamilton and Charles Wilson, architects; with Sir Watson Gordon as president.

The Liverpool Academy was also flourishing, and annually gave a prize of 50*l.* for the best oil-picture exhibited. There were also academies in Bristol, Glasgow, and more art unions than we have at the present time. All these bodies were evidence of a widespread interest in art, and were independent of the great exhibition.

Any visitors who were curious about the official process for turning out designs would find the Government School of Design installed in Somerset House. It was under the control of a committee of management that did not meet at the school, but at the Board of Trade. The chairman was Mr. Labouchere, president of that Board, the vice-chairman, Lord Granville, who did not then stand high on the official ladder, being only Vice-President of the Board of Trade. The members of the committee consisted of the Secretaries of the Board; Mr. Stafford H. Northcote, who was in those days the legal adviser to the Board; Mr. Shaw-Lefevre, Clerk of Parliaments; Sir R. Westmacott; Mr. George Richmond, who was then outside the Academy; and Mr. Ambrose Poynter, architect and referee under the Metropolitan Building Act; with Mr. W. R. Deverell as secretary and curator. The instruction was given by Mr. Herbert, R.A., Mr. Redgrave, A.R.A., and Mr. H. J. Townsend (the last a most promising artist who disappeared mysteriously), who were head-masters, and by Messrs. Richardson, Burchett, Denby, Herman and Deverell, the assistant masters. Mr. Wornum was an occasional lecturer. It is remarkable that out of so large a body there is only one survivor, Mr. Richmond.

The principle of the school is also among the things that were. The school was simply for the teaching of industrial art. The prospectus stated that for two shillings a month instruction was available for all who desired to obtain knowledge of ornamental art in relation to every kind of decorative work, more especially to such persons as were, or intended to be, engaged in the preparation of designs for the various manufactures of this country. Drawing, painting and modelling were therefore taught with a view to the acquisition of knowledge and skill in ornamental design and decoration. This formed the essential and characteristic business of the school, by which it was distinguished from other schools of art. Accordingly, all the exercises of the students were required to have reference immediately or ultimately to the purposes and requirements of ornamental design. The curriculum will appear very circumscribed if compared with the courses in later art schools. There were eighteen branch schools where the system was in force, viz. in Spitalfields, Manchester, Birmingham, Coventry, Nottingham, Norwich, Sheffield, Stoke, Hanley, Leeds, York, Huddersfield, Newcastle, Glasgow, Paisley, Dublin, Belfast and Cork, and a school for female students was opened at 330 Strand, opposite the entrance to Somerset House. The whole of the schools contained 3,000 students, which, if correct, seems a small number if compared with the returns from the existing schools.

An artisans' school, that was independent of the directive authority of the Board of Trade, was to be found in St. Mary's Terrace, Camden Town. As it was, however, under the patronage of Prince Albert, the opposition, if any, to the Government School was slight. The committee, that included Mr. Baily, R.A., Mr. Ford Madox-Brown, Professor Donaldson, Mr. Thornycroft and Mr. Digby Wyatt, acknowledged the value of the Somerset House and Spitalfields schools, but they considered that the great distance from the localities chiefly inhabited by the workmen employed in casting and chasing of metals, masonry, carving, plastering, cabinet-making, house-painting and decorating, &c., virtually excluded such students from the advantages to be derived from the Government schools. In the Camden Town school the value of

modelling to industrial designers was recognised. The master was Mr. Cave Thomas.

Students who wished to be painters of pictures or modellers were able to find opportunities for practice. Besides the Academy schools, the British Museum and the National Gallery, there were the life academy and draped figure class of the Society of British Artists, that was more prosperous in those days than now; the Artists' Society in Clipstone Street, where a model sat for two hours of an evening, and where Mr. Knight, R.A., lectured on Perspective, Mr. Planché on Costume, Mr. Rogers on Anatomy and Mr. Field on the Chemistry of Colours. Another life academy, also supported by subscriptions, was in Margaret Street, Regent Street, while to many the most important of all were Leigh's and Carey's academies.

MUNICIPAL IMPROVEMENTS IN DUBLIN.

ON Saturday last the members of the Incorporated Association of Municipal and County Engineers met in the Council Chamber, Dublin. The president, Mr. T. de Courcey Meade, C.E., surveyor to the Hornsey Local Board, was chairman.

The President delivered a short address on the aims of the Association and then said:—As an Irishman I recollect passing through Dublin twenty-five or thirty years ago. At that time Dublin was different from what it is to-day. The pavements then were not of the best, and I was pleased to observe that a great change for the better had taken place ten or eleven years ago, when I visited the city for the second time. I was still more pleased when this week I saw the still more important improvements. The hurried visit we pay this time to Dublin prevents the members who have not been here before from seeing one-tenth of what is to be seen in this ancient and interesting city, but I hope that this, our first visit to old Ireland, may be one of many happy and instructive visits which we may pay to this country.

Mr. Spencer Harty, the engineer to the Corporation, was then called upon to read his paper on "Sanitary and Other Works carried out by the Corporation of Dublin." In the course of his paper he stated his object was to give the Association, on their visit to Ireland, as graphic an account as possible of the sanitary and other works carried out by the present Corporation of Dublin, who, with the limited means placed at their disposal, had within the last thirty years so much improved the city that it now could compare favourably with the best-regulated cities in the British empire. Unfortunately, Dublin was not a manufacturing city, and portions of the old city were going into decay; but yet, like the phœnix, it seemed to again rise out of its ashes, other portions springing up and taking the place of those going into decay. The valuation of the city was made many years ago, and the rates were still struck on this old valuation, which in most cases averaged only from one-half to two-thirds of the rent of the houses. Accordingly, the rates seemed high in proportion. The city was also surrounded by townships with independent control, and to a stranger it would be impossible to say where the city ended and the township began. Not one of these townships would be in existence but for the city, and were dependent on the latter for their support. It was late in the day for such divisions; all should be united and placed under one joint board of control and government, who would work together in harmony for the general good, and so equalise the rates. The city proper was bounded by the Circular Road and Royal Canal on the north side and Grand Canal on the south, and contains 3,808 acres, the river Liffey dividing the city into two parts. The average breadth of the city from west to east was 3¼ miles, and length from north to south 2½ miles. It stood somewhat low—the level of the roads on the quays being on an average 20 feet over low-water mark, ordinary spring tides Dublin Bay; from thence there was a gradual rise to the north and south—the former standing on an average 90 feet over ordnance datum, and the latter 65 feet over ordnance datum. The local authority was the Corporation of Dublin, comprising the Right Hon. the Lord Mayor, aldermen and town councillors (sixty members in all, fifteen aldermen and forty-five councillors), representing fifteen wards into which the city was divided. This, the reformed Corporation, came into being in 1851, superseding the older Corporation guilds and a commission known as the Paving Board. The first great sanitary work of the present Corporation was the waterworks. The present Vartry water supply came from a site that was found by Mr. Richard Hassard, a Dublin engineer at present residing in London, but the works were carried out by the late city engineer, Mr. Neville. The Vartry stream rose at the base of the Sugarloaf Mountain (on its southern side), in the county of Wicklow, at an altitude of about 1,050 over ordnance datum, and flowed from north to south, a distance of five miles to the commencement of the impounding reservoir, situate under the village of Roundwood, passing altogether through pastoral lands. On its route to the reservoir it received the addition of tributaries, some of which were larger than the main stream itself. The geological formation of the ground was the Cambrian and Lower Silurian. The water was pure soft water, very much akin to that of Loch Katrine, the degree of hardness being about 1·600 before boiling—Loch Katrine being about 1·900. The work commenced in the year 1862, by forming a large embankment to impound the river and flood the lands to a level of 692·50 over datum, the top bank being 698·50. The area of the ground under water was 409 acres, the by-wash or overflow weir 300 feet long; the cubical content of water in the reservoir at this level was 2,374,358,344 gallons, but means had since been adopted to raise the height of water 12 inches, by stop planks fixed on the top of weir, which had the effect of increasing the quantity by nearly 109 million gallons. A tunnel was built in the rock under the embankment, having a solid plugging (on the water face) of Staffordshire blue firebrick set in cement 38 feet thick; through this was carried two main pipes, the one being 33 inches diameter for the supply, and the other 48 inches for purposes of running water into the old bed of river below the works in case of any necessity to do so. The supply of Vartry water extends and ramifies over a very extended area and district, which includes:—The city, 3,808 acres; Clontarf Township, 1,295 acres; Drumcondra Township, 918 acres; Kilmainham Township, 535 acres; Pembroke Township, 1,621 acres; Blackrock Township, 1,084 acres; Kingstown Township, 1,467 acres; Dalkey Township, 592 acres; Killiney and Ballybrack Townships, 1,017 acres; Bray Township, 1,070 acres; and to extra municipal and rural districts, comprising Cabra, Phœnix Park, Artane, Yellow Lanes, Terenure, Dundrum, Rathfarnham, Rathdrum, &c., of which it was impossible to get the exact area and population. The entire district supplied, including city, township and extra municipal districts, contained an average area of about 40 square miles, all of which was supplied with water from the 33-inch main under the main embankment at Roundwood, only 3¾ turns of the valve being open out of a total of 40 turns, the full number which it takes to open the valve. Each township paid the Corporation a certain fixed rate on its valuation for the water supply, but the supply to the rural districts was in the hands of the Corporation. The entire cost of the works up to date has been 660,000*l.*, which was equal to about 1*l.* 17*s.* per head on the gross population supplied, taking the population of rural districts at 20,000. The rental received by the Corporation for their water supply for 1889 from all sources was, gross total, 62,343*l.* 13*s.* 11*d.* The cost of maintenance, including salaries of officers, office expenses, labour and materials, was 60,491*l.* 6*s.* 4*d.*, leaving a balance to credit of 1,852*l.* 7*s.* 7*d.* on December 31, 1889. Dealing with the question of paving Mr. Harty said:—In more recent years, and up to the year 1851, the maintenance of the streets in Dublin was carried out by a Board called the Commissioners for Paving the Streets of Dublin, after which time it was transferred to the present Corporation, who lost no time in trying to set their house in order, and at once commenced to pave some of the streets with square setts, and laid down others with macadam. Gradually, however, macadam was disappearing from the streets, and sett paving on a concrete foundation increasing in the same ratio. Before the passing of the Irish Public Health Act of 1879, the improvement rate in Dublin was limited to 2*s.* in the pound, so that the hands of the Corporation were practically tied, and very little improvement could be carried out in the way of street paving, &c. Previous to 1880 there was no street paved with setts on a concrete foundation. In that year, however, 100,000*l.* was borrowed from the Government for twenty years, at 7*l.* 0*s.* 8*d.* per cent., including principal and interest, the latter being 3½ per cent., and the first street thus paved was Marlborough Street. Again, in 1886, another 100,000*l.* was borrowed, and paving still further extended on the same system, but work was carried out by men in the employment of the Corporation and without any contractor. The cost of work varied considerably, some streets costing as much as 13*s.* 6*d.* per yard, whilst others have cost only 11*s.* 6*d.*, the price of setts being much higher than formerly. The cross-section had also been reduced, but in many instances it would have been better if the streets had not been paved so flat, as the cost of maintenance was increased, and the water was not so easily thrown off. The entire cost of square sett paving in Dublin up to the present had been about 310,000*l.* The total mileage of the streets and lanes of Dublin was about 126 statute miles. For the maintenance of the streets the sum passed by the Council for this year was—Macadamising, 6,000*l.*; paving, 7,491*l.*; flagging, 3,425*l.*; ashphalting, 500*l.*; concreting for paths, 2,442*l.* Now there were about 1,168,000 square yards of macadamised streets in the city, for maintenance of which they got 6,000*l.*, or about 1¼*d.* per square yard of street surface, including labour, and where some of the streets are completely worn down and had

to be remade each year, thus taking a large portion of the sum passed, it could hardly be said that the amount was sufficient for the proper maintenance of macadam in Dublin. For the paving they got about 2⅛*d.* per square yard, and for this also they had gradually to repave some of the streets, and still maintain and repair the wear and tear of the remainder, for which the sum voted was only ¾*d.* per yard. Most of the streets about the centre parts of the city, especially adjoining the river, were all on made ground (and in no parts had they a clean gravelly subsoil); the consequence was that the formation of the streets generally was a soft, muddy and dirty one, and it was an absolute necessity, in a sanitary view, to use concrete foundation, and in many instances it should be thicker than the prescribed 6 inches. Referring to wood-paving on concrete foundation, he said it was first laid down in 1880; most of this was still intact, and had not required any outlay whatever. The entire scavenging and cleansing of the city was now carried out by the Corporation staff, and without any contractors; stabling and offices, together with depôts, being placed in various districts of the city. Strictly speaking, there were no refuse destructors in Dublin. They had in one depôt a furnace for the burning of a certain description of garbage, but it was not of the most recent design, such as were at present made in England. A great deal of the scavenge of Dublin had to be taken to the sea in a hopper barge, the barge being towed out by a tug-boat some distance beyond Howth Head. There were 147 trips run last year, and 63,416 loads of unsaleable refuse were thrown into the deep sea, the total cost being 1,371*l.*, or a little under 5*d.* per load. Saleable stuff from the streets was, as far as possible, sold, but of recent years the sum received had dwindled down from 1,400*l.* in 1888 to 662*l.* in 1890. Undoubtedly the time was fast approaching when proper destructors must be erected in Dublin, or else more barges put on the station, which was a most expensive operation. The cost of the barge was 6,261*l.* There were 474 men employed in the cleansing department last year, and 115 horses, the total cost of each horse amounting to about 10*s.* 6*d.* per week for food and straw. The estimate for public and domestic scavenging for 1890 was 29,170*l.*—equal to 6*d.* per square yard on the entire surface of streets. There were something close on 100 miles of sewers in Dublin, 76 of which had been entirely newly built by the present Corporation, the remainder being old ones remodelled, renewed and underpinned; all the new brick sewers were egg-shaped and the old had been newly inverted. The sewage at present all gravitated to the Liffey, where it was discharged, all the outlets being well within the city boundary. Although most of the sewers had good falls and were properly constructed so as to be self-cleansing, in a great many instances it was found that such was not the case, partly caused by the scavenging labourers sweeping the mud, &c., down into the gullies, and private drains being made use of for the purpose of getting rid of ashes and all sorts of house refuse. This was a difficult matter to deal with, as it was almost impossible in either case to get at the delinquents; nevertheless it was not only a source of trouble and annoyance, but also of expense. There was no automatic flushing to any of the Dublin sewers, the course adopted being to flush periodically by means of a hose worked from one of the street hydrants. For many years the question of taking the sewage out of the river had been agitating the public mind, and in 1870 a scheme was promoted before Parliament, and for which an Act was passed, to convey the sewage out to the North Bull, a distance of about four miles from the city boundary, and there discharge it into the bay at certain states of the tide. Plans were got up for this work and estimates obtained, but the amounts were so much in advance of the estimates that the work was withdrawn, and the scheme remodelled; but even this latter was withdrawn. Subsequently it was proposed to get up a scheme of precipitation, the works to be constructed on the slob lands at Annesley bridge, immediately adjoining the city boundary; however, nothing had been done, and the Act had been allowed to lapse. The question had now again been brought forward, and the Corporation are at present deliberating on what course to pursue. Undoubtedly, so far as Dublin was concerned, the proper course would be to discharge the sewage at once into deep sea, if a suitable outfall can be obtained at a comparatively reasonable outlay. The remainder of the paper, which was not read, dealt briefly with baths and wash-houses, markets, the abattoir, public libraries, &c.

Mr. Edward Pritchard expressed his thanks to Mr. Harty for his able and instructive paper. It was a matter of great interest that they should be in Dublin, and he hoped they would be here again before long. Dublin must be complimented on its water supply—a supply of such purity and abundance at so small a cost. Dublin had its supply now for thirty years, while in Liverpool, Manchester and other places great efforts had been made to improve the supply. In Birmingham, where the water supply was intended for 600,000, it was proposed to expend five or six million pounds to improve the present supply. That must appear satisfactory for Dublin.

The Lord Mayor gave a banquet to the members.

Mr. de Courcey Meade, in responding to the toast, "The Association," said that it afforded the members of the Association extreme pleasure to visit the Emerald Isle. It was their first visit to Ireland, and it was to him, as an Irishman, an honour to represent the Association on their first visit to that dear old country. The friends who accompanied him to the city were agreeably surprised with all they saw there. They had heard something of the fine waterworks, but while they never questioned that there were works of a great character, all they anticipated in reference to them was more than realised by their visit to them on the previous day. On that morning they visited the great establishments—the brewery of Messrs. Guinness, and the distillery of Messrs. Power, and in both places they were received with the greateat courtesy and kindness by the representatives of the respective firms. As to the extent of the works connected with both establishments, it was not imagined by nine-tenths of the gentlemen who that day visited them. Since they left those works, it was a matter of constant remark as to the immense business which was carried on in the ancient city. Their Association was especially an Association of engineers, but there were amongst them some architects who were very near failing in some of their appointments owing to their desire to go out and view some of their fine buildings; one, in particular, the Bank of Ireland, then Trinity College, and numerous other buildings. On his way to the City Hall that morning he saw no less than three of their members photographing the buildings, for they wished to take back impressions of the fine old buildings in the capital of Ireland. It was gratifying to the members of the Association to hear the remarks made by the Lord Mayor, and to be received by his lordship with so much courtesy and hospitality, and they should certainly go back to their own country impressed with the hospitality of Irishmen. On former occasions they had been entertained hospitably by the Lord Mayors of London and York, and by the Mayors of Manchester, Liverpool, and most of the large towns in England, but yet he could safely say that they had never in years gone by been received with such courtesy and hospitality as they had been by all with whom they had been brought into contact since they landed in the old city of Dublin.

Mr. Pritchard, C.E., said, as it was his third visit to Dublin, he knew something about the city, and he should say this, that while they prided themselves on their municipal institutions and home government in England, he and his brethren of the Association now in this city would certainly be very quiet when they should get back. They should have to say this, that if they took into consideration all the advantages enjoyed by cities and towns in England there were few of them which could compare at the present moment with that ancient and beautiful city of Dublin in which they now were. Mr. Harty gave them a history which they should never forget. He told them that Dublin was an ancient city. If they did not know that before they ought to have known it. It had one of the best water supplies in the world—a supply so vastly in excess of the requirements that they were prepared to allow the inhabitants the use of an abnormal quantity. Liverpool, Manchester and other cities had to bring their supplies from long distances. One city obtained its water in Wales, some 60 or 80 miles off; another city obtained its water from the lakes of Cumberland. Birmingham had a population of over 600,000; it had a water supply, and they were now going to amend that supply at a cost of from 5,000,000*l.* to 6,000,000*l.* These were important facts. Years ago the streets of Dublin were paved with old cobble stones, and it required strong boots or shoes to walk over them. All those stones had been since removed, and the streets of Dublin were now paved in such a way as they should be proud of any English town which was equally well paved. Odours, of course, arose from the celebrated and historic river Liffey, but the less said on that subject the better. Much could yet be done for the improvement of their works and for the health of the inhabitants of the city.

BLEWBURY CHURCH.

THE parish church of Blewbury was reopened this week after restoration, which has been carried out, under the direction of the diocesan architect (Mr. John Oldrid Scott), by Mr. Y. J. Lovell, of Marlow.

The church of St. Michael, formerly dependent on Reading Abbey, is, the *Reading Mercury* says, a structure of rubble, flint and stone, consisting of chancel, with a chapel on the south side, nave, aisles, transepts, the piers and lantern stage of a central tower, north and south porches, and a fine western tower of three stages, with a quatrefoiled parapet and crocketed pinnacles with vanes, and containing a clock and six bells, of which the fourth and earliest is dated 1586, and the others 1633, 1689, 1704, 1752 and 1825 respectively. It was originally a building of the late Transition or Anglo-Norman period, dating from about 1180, a considerable portion of this structure still existing. The chancel, with its interior south wall, is Transi-

tional. It retains a fine stone groined roof and one of its original windows, besides a small circular opening in the apex of the eastern gable, but its other windows are late Decorated. The south wall of the chancel was cut through about 1350, on the erection of the chapel. This is a Decorated work, and the reticulated tracery of the windows is characteristic of the style at its best period. On the south side is a piscina; two pointed arches, enclosed by screens of carved oak, open to the chancel, one of these being good Perpendicular; and there are also two ancient prayer-desks of the same date, both elaborately carved. The piers of the central tower, also Transitional, are of unusual thickness, and at the angles are slender nook shafts, the capitals having the volute and straight-leaved ornament peculiar to this date. From the chafings of the ropes upon the arches, still plainly distinguishable, it would seem that this tower had four bells. The vaulting is perfect; the two easternmost piers are pierced with hagioscopes, that on the south being Perpendicular and the other square and probably original; the south-west pier contains a flight of stone steps leading to an open archway on the right of the nave, and anciently the entrance to the rood-loft, which, it appears, had a piscina, a unique feature discovered and carefully preserved during the recent restoration. The lower door is Perpendicular, with elaborately carved panelled tracery. The nave is separated from the south aisle by an arcade of five Transitional arches, the two westernmost being wider and loftier than the others. These spring from stilted circular columns, the capitals having the volute ornament, and in one instance early foliaged work. The north arcade is Decorated, and has two arches only, supported by octagonal columns. Plain Perpendicular windows light both aisles, and the west window in the tower is a good example of the same date. The tower opens to the nave by a bold and lofty arch, and its lower stage serves both as a vestry and ringing chamber. The original porches seem to have been removed in the Perpendicular period, and replaced by substantial porches of open timber-work with bargeboards richly carved. Of these the south porch remains, but the north porch has lately been rebuilt in flint with stone dressings, its carved work reproduced and a new oak door hung. Above the doorway is a stone niche, and on either side are small stone slabs, one containing brass figures with scrolls. The south door, a venerable relic, has a huge wooden lock and fine Early English ironwork. The font is of Perpendicular date, octagonal and panelled in quatrefoils; around the under surface are alternate fleurs-de-lis and *écussons à bouche*. In the church are several brasses to the ancient family of Latton, of Upton and Chilton, and subsequently of Kingston Bagpuize, and of Esher, in Surrey. The earliest is that of a knight in a full suit of plate armour, with his two wives, date probably c. 1500, and perhaps representing Thomas Latton, of Upton, who died April 8, 1503. These figures were formerly affixed to the walls, having been removed from their stone slab, a portion of which, with a brass shield of Estbury, has long served as a step at the south door. During the recent restorations the figure of the knight with one wife and some children have been affixed to a new stone and placed on the north wall of the chancel, the other wife being left on one of the tower piers. There is, however, ample evidence to show that they all belonged, until the last century, to one memorial. On the south side of the chancel, on the floor, is the brass of John Latton, of Chilton, with effigies of himself, habited in a tabard of his arms; Anne (Yate), his wife, and six children out of the fourteen named in the inscription. He died May 31, 1548; Alice, sister of this John Latton, married Sir John Daunce, general surveyor of crown lands in the reign of Henry VIII.; he accompanied the King to France in 1513, and was knighted by him in the church of Tournay; in 1515 he was Sheriff of Oxon and Berks, represented Oxfordshire in the Parliament of 1529, and died December 7, 1545. The remains of the tomb erected, apparently both to himself and his wife, are now in the south chapel, having been removed thither since the time of Ashmole; it was originally an altar tomb, but only the upper slab and some portions of the base now exist; on the former are the figures, in brass, of Sir John and Dame Alice Daunce; both are heraldically clad, and around are the shields of Daunce, Latton, Estbury and Percy, with an inscription to Dame Alice Daunce, who died August 27, 1523. Against the south-east pier, in a slab of Purbeck marble, is a brass with effigy and Latin inscription to John Balam, a former vicar, who died May 25, 1496, and on the south side a modern brass, with a figure of Faith, and inscription to the Rev. Jacob Macdonald, LL.B., of Caius College, Cambridge, thirty-five years vicar of this parish, who died June 4, 1871; his wife, Eliza, 1849, and his son, John, 1841; below this is a marble tablet to the Rev. Arthur Bromley, chaplain to John, third Earl of Clarendon, and for five years curate here, who died December 29, 1831; on the opposite wall, previous to the restoration, was a large monument of good Classic design, to Mrs. Sarah Witherell, died October 12, 1728, with fluted columns supporting a pediment. This has entirely disappeared, and the memorial slabs formerly on the chancel floor have been buried, and the floor entirely relaid with encaustic tiles. Of these slabs, one bore an inscription to Elizabeth, wife of Daniel Lousley, who died June 15, 1828, and has been reproduced on a smaller scale; the remainder are indicated only by initials. A small Norman window on the north side has been filled with stained-glass to Eliza Serre Rotch, April 16, 1878. There are existing mural monuments to John Bushnell, Esq., 1816; Ann Goddard, 1847; John Gammon, 1828; and to the family of Humfrey, 1788–1860; and floor stones inscribed to Thomas Plott, M.A., Fellow of Pembroke College, Oxon; Martha, daughter of James Baker Jauno, 1720, and to the family of Slade, 1757–1820; in the north aisle is a small inscription on brass to "John Casberde, one of the good benefactors to this church, c. 1500," and a large floor slab in the tower retains a similar one, much worn, to John Bouldre, 1499. Of other antiquities attached to the church may be mentioned two venerable copies of the religious books ordered to be provided by every parish in the reign of Edward VI., viz. Udal's edition of the "Paraphrase of Erasmus on the New Testament," and Bishop Jewel's "Defence of his Apology for the Church of England"; these are partly bound with iron, and have the chains by which they were probably attached to a lectern. Ashmole, however, says that in his time two large books were chained to the monument of Sir John and Dame Alice Daunce, mentioned above. In 1886 two recumbent effigies of stone, apparently of a knight and his lady, now much worn and lying on the east side of the south porch, were removed to the north side of the churchyard next to the tower. The restoration of the church has been proceeding at intervals for several years past, in part under the direction of Mr. Edwin Dolby, architect, of Abingdon, and has included the entire renewal of the nave roof, in exact fac-simile of the old open timber roof, the relaying of the floors and the removal of the high pews and north and west galleries; a new pulpit of carved oak has been erected and the eastern end of the chancel raised, a sedilia being formed in the eastern arch of the arcade now closed by new screen work; an ancient aumbry has also been refitted, and a reredos of carved alabaster set up and north porch erected. On the completion of the repairs to the nave and chancel, the church was reopened by the late Bishop of Oxford in 1877. More recently the north aisle has been restored, and an organ introduced, for which a special service was held on September 14, 1882. The communion plate includes a silver chalice, dated 1663, and a paten of silver, given by Malthus's trustees. There are 300 sittings, all being free. The register dates from the year 1588.

Blewbury was anciently a prebend, attached to the cathedral church of Salisbury, and was assessed in 1226 at 40 marks, and in 1534 at 54*l*. The right of nomination appears to have rested with the knights templar and the knights of St. John of Jerusalem, or hospitallers, but the Crown contested this claim. The advowson of the church was given to the knights templar by Thomas de Sandford, chamberlain to King John. Among the prebendaries may be named Adam de Osgodby, Master of the Rolls and Canon of York, 1312-16; Roger de Northburgh, Bishop of Lichfield, 1316; Ralph de Stratford, Bishop of London, 1335; and John Tinmouth, or Maynelyn, "Episcopus Argoliensis," 1511. Towards the close of the sixteenth century the estate forming the prebend, in the deanery of Abingdon, after some exchanges, was merged into the separate estates belonging to the see of Salisbury, and the prebend dissolved.

Among the former curates of Blewbury was the Rev. Morgan Jones, an eccentric character known as the "Blewbury Miser," who died worth about 40,000*l*. He wrote his sermons on scraps of paper, sometimes torn from the walls, and lay in bed while his single shirt was washed. A threadbare coat, said to have been worn by him for forty years, is now in the possession of Mr. Luke Lowsley, of the Manor House, Hampstead Norris.

Several distinguished characters were natives of Blewbury and benefactors to the parish, and among the ancient families connected with the place may be mentioned the Humfreys, still resident there. A William Humfrey lived there as far back as 1340. An interesting tradition associated with this neighbourhood is that Christianity was first preached to the West Saxons by St. Birinus on the adjacent Downs. The whole country around Blewbury is full of historical interest, and a visit to the place would amply reward lovers of antiquarian lore.

We are indebted to Mr. Luke Lowsley for information relating to several curious and interesting incidents in the history of Blewbury. He informs us that at one time the people of Aston Upthorpe, which is in the parish, had a great objection to being buried at Blewbury, and a woman who lived at Aston Upthorpe was heard to declare that if Blewbury bell rung for her, she hoped it would split. The bell was rung at her funeral, and tradition states that the bell split. A new bell was cast by a man named Hunt, who placed upon it the following inscription:—

> Three times run, and twice cast,
> Blewbury tenor was made at last.

It is said that Hunt threatened that if he did not succeed in making the bell in three castings he would destroy himself, and

it was a remarkable circumstance that he committed suicide some time afterwards, and in accordance with the custom which then prevailed, he was buried with a stake driven through his body, at the cross-roads just outside the village, at a spot still familiar as Hunt's grave. Mr. Job Lowsley, father of our informant, Mr. Luke Lowsley, was churchwarden of Blewbury at the time the new bell was cast, and he was wont to relate that he saw the bell slung up under a large yew-tree in the churchyard, and that it was filled with beer, contributed by the parishioners, and that the contents were drunk by the villagers who assembled. Mr. Job Lowsley secured two or three bottles of the liquor, one of which is still in the possession of his son, Mr. Luke Lowsley. It is a curious circumstance that although not a drop of water runs into Blewbury, springs rise in sufficient number and quantity to drive a mill, and there are numerous streams in which watercress grow prolifically, and the cultivation of it is one of the principal industries of the place. Large consignments are made to London, where Blewbury watercress is daily hawked through the residential districts, and where a ready sale is effected.

TESSERÆ.

Scale in Ornament.

THE ornaments of architecture, being executed in a very hard and durable substance, are in fact only beautiful when they appear but as minute parts of the whole. The great constituent parts of every building require direct and angular lines, because in such parts we require the expression of stability and strength. It is only in the minute and delicate parts of the work that any kind of ornament is attempted with propriety, and whenever such ornaments exceed in size, in their quantity of matter, or in the prominence of their relief, that proportion which in point of lightness or delicacy we expect them to hold with respect to the whole of the building, the imitation of the most beautiful vegetable forms does not preserve them from the censure of clumsiness and deformity. A balustrade might with equal propriety be finished in waving lines, but certainly would not be beautiful. A twisted column, though affording very pleasing curves to the eye, is acknowledged to be less beautiful than the common and regular one. In short, if the serpentine form were the only form of beauty, it might with sufficient propriety be introduced into a great number of the ornamental parts of architecture. The fact, of which every person may assure himself, that such forms are beautiful only in those parts where the quantity of matter is minute, the relief small and the workmanship more exquisite, affords a strong presumption that such forms cease to be beautiful when the general association we have with them is destroyed. It is the same limit which seems to determine the beauty of those forms which are executed either in wood or plaster for the ornament of our houses. Every person must have observed in old houses the absolute deformity of those figures with which the roofs were decorated, and in comparing them with those of modern times will perceive that the great superiority of the latter consists in the greater delicacy of the forms as well as in the greater perfection of the execution. In both, flowers and foliage are imitated, but in the one in full relief and upon a scale sometimes greater than that of nature; in the other, with the simplest relief and the finest lines that are consistent with the preparation of the subject. The terms, accordingly, by which we express our contempt or our admiration of them are those of heaviness or lightness, terms which in this subject are synonymous with massiness or delicacy. The subjects, however, are the same, and no other circumstances intervene but the superior delicacy of the forms and the greater accuracy of the workmanship.

The Tortoise Emblem in Greek Sculpture.

The tortoise enters into several traditions of different Hellenic races, and it is found as the attribute of their deities. Its general position is at the feet, and hence its name, for an obvious reason, was one of the expressions for a footstool, and it was with these wooden footstools that the Thessalian women killed the courtesan Lais in the temple of Aphrodite Anosia. The tortoise was placed at the foot of Aphrodite or Venus, of Hermes or Mercury, of Pan, of Apollo, and of Æsculapius his son, as well as upon the arm of Zeus. It has been supposed that its relation to Hermes is on account of his invention of the chelys or lyre, for which purpose this god employed the shell as a sounding-board; or from the part performed by the god in changing the envious nymph Chelone into this animal. According to another Arcadian tradition the tortoise was sacred to Pan, and this god, in the old theogony, was the son of Hermes and Dryope; but the details of the amour in which Hermes, like the Apollo Nomios, tended the herds of a mortal are wanting, and might throw considerable light upon this subject. The usual tradition, in which Mercury, surnamed Akakesios, discovers the tortoise upon Mount Chelydorea is all that can be deemed certain. Not so with respect to Apollo; it appears that he became enamoured of Dryope, the only daughter of Dryops, King of Oeta, and that in order to effect his purpose, while she was playing with the Hamadryad nymphs, the god changed himself into a tortoise, and when taken up as a plaything by her and placed in her bosom suddenly changed himself into a serpent, terrified the nymphs, and became, by her, the father of Amphiesus. The collections of Antoninus Liberalis are so filled with traditions totally distinct from those of the earlier writers that it is extremely difficult to verify the notices he gives, yet there is reason for believing that the tortoise anciently had an intimate connection with Apollo, for when Crœsus sent to the oracles of Asia Minor, Greece and Libya to try their discernment, he cut up and seethed in a brazen pot a tortoise and lamb—a very significant act if it is considered that they were the animals sacred to the gods Apollo and Ammon.

The Chancel in English Churches.

It is a curious fact that, strictly speaking, the chancel, in the modern sense of the word—*i.e.* denoting the eastern portion of a church—is not legally part of the church at all, since the parish is bound to keep the church in repair but not so the chancel, which belongs to the rector, and the rectorial estate is chargeable with these repairs. Instances have, unfortunately, too often occurred in which landowners who have become lay rectors have evaded their duty, and of chancels actually being pulled down to avoid the cost of keeping them in repair. A curious archæological fact may be occasionally noticed arising from the negative position of the wall separating the chancel from the nave, which, as Mr. Parker ingeniously remarks, is frequently the oldest part of the church, the chancel having been rebuilt at one period and the church at another, while this wall and arch has been left standing in both, and he states his belief that even now it is, as it undoubtedly was in former times, a disputed point in law to which portion of the edifice the said arch properly belongs, and consequently on whom the duty of repairing it really should fall. The whole subject is one of great interest and not easily to be unravelled, owing to the complexity of evidence and the oft-discussed but rarely settled questions to which these contrarieties give birth.

James Wyatt, R.A.

The birthplace of James Wyatt was Barton Constable, in Staffordshire, where his father was both a farmer and dealer in timber. He was born in 1746, and at an early age was introduced to Lord Bagot, who being then about to set out for Italy, as ambassador to the Pope, took Wyatt with him. He was fourteen when he arrived in Rome, and he spent there three or four years, examining the principal monuments of ancient architecture, but, it would seem, without imbibing any taste for the modern architecture, since no traces of it are discoverable in his own works. On quitting Rome he proceeded to Venice, where he studied for about two years more under Vicentini, an architect and painter, and then returned to England, after being absent altogether about six years. His design for the Pantheon in Oxford Street, which was finished and opened in 1772, at once stamped his celebrity, and he thenceforth became the "fashionable" architect of the day. It was fitted up in a style of splendour till then unprecedented in this country, and was eminently attractive as the resort and rendezvous of the gay world, yet how far it merited all the encomiums passed upon it as a work of architecture it is now hardly possible to decide. Though it was esteemed a masterpiece, no copy of the original designs has been preserved to us as an authentic memorial of Wyatt's Pantheon. There exist, indeed, views of the great room or "rotunda," but they are such that very little reliance is to be placed upon them, and even were they satisfactory in themselves, they furnish very imperfect information; nor is more to be obtained from description, nothing deserving to be called so having been written at the time. The Pantheon seems to have been the only building in the metropolis executed by Wyatt, for he obtained no more commissions in London, either public or private. Commissions poured in upon him, but all from different parts of the country, and chiefly for private residences, the majority of which hardly aspired to the character of mansions. Wyatt's Grecian style, admired in his own day for its then almost proverbial "simplicity" and chasteness, now strikes us as being very *jejune* and bare, and not so marked by as deficient in that artistical simplicity which results from uniform finish throughout, perfect harmony of character and unity of expression. There is more of the pretty than of the beautiful, of the neat than of the elegant, of the plain than of the simple, in his so-called Grecian or Græco-Italian style; nor could it, perhaps, be better described than as a sort of genteel commonplace. Probably he would have done more in his art had he been employed on fewer works, for the multiplicity of his professional engagements prevented him from bestowing much study on the respective designs. It has been recorded of him as matter for

admiration that he was in the habit of improvising his designs while travelling in his carriage to the places he was about to be employed at; no wonder, therefore, that so many of them present such sameness and poverty of ideas, and so very little study, being apparently little more than first hasty sketches with hardly any revising. Accustomed to this specious commonplace and indolent fertility, he could scarcely rise above it on occasions which either demanded or afforded opportunity for achieving something really noble. His design for Downing College, Cambridge, where, however, he was not eventually employed, was animadverted upon in a letter from Mr. T. Hope to the architect himself as being altogether unworthy of the occasion. About 1784 Wyatt began to turn his attention to the Gothic style of architecture. At that time there were no publications, as at present, to initiate the student into the art and facilitate his progress by exhibiting specimens ready drawn and measured, so that Wyatt had to draw and measure for himself, which, it must be remembered, was a great disadvantage. It is therefore highly to his credit that under such circumstances he gained the insight into it which he did. His first essay in the Gothic style was Mr. Barrett's, at Lee, near Canterbury, which he executed in 1783, and which was as happy a hit in its way as the Pantheon had been. In making alterations and improvements in the older edifices in that style he was extensively employed at some of the colleges at Oxford and at the cathedrals of Salisbury and Lichfield. Besides the edifices before mentioned he was also employed at Woolwich, the House of Lords, Windsor Castle and Kew. In 1802, on the retirement of West from the office of president of the Royal Academy, Wyatt became his successor, to the no small dissatisfaction of that body, who viewed with jealousy an architect in the chair. He was, however, not long seated there, for the following year West was re-elected. James Wyatt died September 5, 1813, in consequence of being overturned in a carriage while travelling from Bath to London. He left a widow who survived him four years and four sons, one of whom was the architect for Drury Lane Theatre. Notwithstanding his very extensive and lucrative business James Wyatt was so far from accumulating a fortune that he was often involved in pecuniary difficulties.

Lombard Architecture.

Mr. Hope remarks that "in Lombard buildings the whole of the strength requisite for support and resistance is sought in the general thickness of the wall." This power of the wall constitutes the theme of the Lombard system of expression. The most common and peculiar decoration of the Lombard style is a sort of recessed panelling, produced, as it seems to the eye, by removing a certain thickness of the wall and leaving a band of the original thickness, which follows the outlines of the walls and surrounds the recessed spaces. This recessed space is seldom allowed to be large enough to admit of the eyes resting upon it to the exclusion of the raised surfaces. If the front or flank of the building is too large to be thoroughly taken in at once, its surface is divided up by strips of wall dropped from the upper projecting surfaces or "wall plates," or sometimes sent across from the perpendicular strips at the angles. These bands are of little, often of no use, to the wall, the true buttress form is carefully avoided in them, but they powerfully aid the Lombard expression by beginning, as the like Greek architecture began, with a delicate but decided assertion of a superabundance of the kind of power to be displayed. The office of these "wall plates" is greatly assisted by their reception of a degree of enrichment greater than that which is conferred upon the principal recessed surfaces. This enrichment, which consists in its most frequent and most efficient form of a series of simple arch-heads or "scollops," impresses on the eye the existence and character of the raised wall-plate, and is therefore "decoration" precisely in the same sense as the Greek fret or egg-and-dart is decoration. These recessions of the general surface of the wall are seldom limited to one degree; the recessed face recedes again behind a series of shallow arcades, and yet again, arcade within arcade, and in the upper parts of edifices there are often actual galleries practised in the enormous thickness of the wall. Apertures are turned to account with great skill; the chamfer or bevel of those which are to give light, contrary to the method which would be dictated by mere utility, is often chiefly external, and its depth is commonly marked and even exaggerated to the eye by a perspective of elaborately carved mouldings one behind the other. Lombard doorways of large dimensions are often approached by an advanced porch, and we do not perceive, on entering, where the porch ends and the wall begins; thus the eye is saved from the disappointment it might suffer upon perceiving that the wall decoration had indicated an amount of thickness which the wall, however solid, must have failed to realise. The devices employed on this feature for augmenting the importance of the wall are various and highly interesting, but they are too numerous and require too much technical explanation to be described here. There is one, however, of the most common and effective of these methods which we must not pass over. When there is no porch a great part of the thickness of the wall is traversed and forced into notice by the shafted and moulded arch, but before the wall is pierced this chamfered approach stops and is made to include a portion of plain wall with an aperture, of which the head is horizontal and the jambs plain and at right angles to the face of the wall. Thus there is a series of deep recessions from the outer wall surface which, when they terminate, leave a further thickness to be traversed by the true aperture, the rectangular cutting of which leaves the remaining thickness, when the spectator is not absolutely within the doorway, to be measured by his imagination. The outlines of apertures are most appropriate. Doorways and arcades always adopt the semicircular arch, and the most characteristic form of the Lombard window is the perfect circle, exhibiting the principle of the arch, of which, as we have said, the proper object is the wall, in its fullest development. The rosette window is the invention and most striking feature of Lombard architecture, and it is impossible to imagine a more admirable means of giving effect and artistic importance to the wall than the presence, in every principle façade, of the great circular window, revealing by its deep and decorated chamfer the vast power to which, by its form, it expresses an infinite power of resistance. The filling up of this window, when it is large, by thick bars radiating from an inner circle, like the spokes of a wheel, excellently and obviously subserves this expression. Ornament in Lombard edifices is beautifully subordinated to the effect of pure masses of wall. It clusters about windows, cornices, string-courses and doorways, and breaks out occasionally upon the wall itself, but it is always felt to be a judicious and brilliant foil rather than an interruption to the plain and principal wall surfaces. This is the right economy of decoration, for that which is all decoration is no decoration. Decoration should always, as in this case, subserve an object, and not be an object in itself. Lombard decoration was moreover fitted, no less by its peculiar character of amazing and apparently reckless variety than by its skilful distribution, to give expression by contrast to the pure sheets of the all-important wall.

Temple Statues of the Greeks.

In Greece, as in other nations, the first employment of sculpture was to serve the cause of religion, and for a long time it was, as elsewhere, subjected to a strictly prescribed mode of treatment. Its development in forms of exquisite beauty was owing to peculiar causes. The chief may be found in the extreme sensibility of that people to material refinement; and next, it may be attributed to the impulse given to that predisposition by the sublime notions put forth, first by Socrates and then in the philosophical system of Plato, who propounded the almost divine dogma of the connection or union of the good and the beautiful. This was accepted by his fellow-countrymen, and especially by the acute and sensitive Athenians, as almost an inspiration. The great sculptors of the age of Pericles, beginning at about 450 years before Christ, first gave expression in art to this revelation of a new system, and their gods and heroes, their divine and semi-divine personages came from this time to be represented in forms of appropriate perfection and beauty. Before this the images were but types of ideas without any regard to their having agreeable or pleasing forms. Indeed, the idea was rather to make them terrible than attractive, and, as deities, exceptional; and it is curious to read how opposed the priesthood appears to have been at first to the innovation upon old usages which the new doctrine occasioned. The prejudice of this body was doubtless strengthened by the fear that any interference with established religious representation might weaken their moral influence. The form given to the gods had hitherto been received by the people as the authorised and orthodox mode of representation, and there were not only spiritual but material interests at stake should the new light that was breaking in upon the sensibilities of the community place the hierarchy in a less important position than that which they had so long occupied. Phidias, the great sculptor of the age, was boldly charged with sacrilege for having in one small particular innovated upon established usage by introducing a lay element—a portrait—in one of his most celebrated Temple statues. By degrees, however, this ground was abandoned even by the priests, who, perhaps seeing in time the policy of not offering a useless resistance to the tide of public feeling, wisely joined in recognising the new sentiment that had sprung up. The practice of sculpture was thus entirely changed, and what was great and noble in intention or sentiment was made also noble in the form in which it was presented. But still, for a considerable period the mission and object of sculpture was in its service to the Temple. Whether the god or goddess was to be represented, or whether the great deeds of the persons of their hero-worship were to be illustrated, it was all more or less connected with their religious system. It was later, when this exercise had led to its material perfection, that its employment on other and less noble objects was introduced. Its beauty then became so attractive, irrespective of its purpose, æsthetically, that it was sought for this quality exclusively.

NOTES AND COMMENTS.

The Corporation of Liverpool, like similar bodies in Scotland, are responsible for the conservation of certain churches and the salaries of the ministers. The advantages of the arrangement are not apparent to all, and the returns for the outlay are unsatisfactory. In Scotland there is a close alliance between Church and State, which may account for the appropriation of money towards ecclesiastical work; but in England there are enough secular needs to employ all the cash that can be raised by rates. A return that was made out a few weeks ago in Liverpool, showing the outlay on churches, was enough to amaze the citizens, the majority of whom probably were not aware of the extent of the expenditure. It is not surprising that an effort is to be made to get rid of so expensive a privilege. The Finance Committee of the Corporation, after considering the return, passed the following resolution:—"That in the opinion of the committee it is desirable that Parliamentary powers be obtained for making provision for the extinction of the present liabilities of the Corporation in connection with the Corporation churches, and for the pulling-down, removing or otherwise dealing with some of the churches, subject to such terms and conditions as may be imposed by Parliament, and that with this object the Council be recommended to refer the consideration of the matter to the Parliamentary Committee with instructions to prepare a scheme for submission to the Council." The people of Liverpool will, of course, have to pay a good sum to become free. If the churches were of architectural importance it might be wise to entrust the care of them to a public body, although in Liverpool the Corporation would not be qualified to undertake such an office; but, as it would be difficult to spoil the majority of them, the congregations may well be trusted with upholding them.

The French Historic Monuments Commission should be entrusted with an adequate sum of money to complete the restoration of the castle of Pierrefonds, or the quarter of a million sterling which was expended under Viollet le Duc will be in a measure thrown away. That marvellous draughtsman was not entrusted with many buildings by clients, and it is not a wonder that, having but scant experience of materials, an unsuitable stone should be selected by him for his restoration of Pierrefonds. The consequence is that a large part of the masonry already needs to be removed; and, in fact, the difference between old work and new is recognisable by the number of defects which are apparent in the modern masonry. If the restoration had been completed there would be fewer spots exposed, and the rain could not so easily operate on the interior of the walls. Whatever may be the cause that originated the dilapidations, Pierrefonds is so important a show-place it will not be wise to allow further decay. It is well to have a substantial building in order to induce visitors to imagine that the castle in its pristine condition corresponded with what they behold.

The county surveyorships of Ireland, which are now obtained by competition, are not among the prizes of the engineering profession. Among the classes of works which they have to undertake are maintenance of public roads and footpaths, and the construction of new ones; maintenance of bridges, retaining walls, fences, pipes, &c., and the construction of new works; hill-cutting and other improvements to public roads, maintenance of court-houses and various public buildings, superintendence of tramway construction and works which entail interference with the county roads, maintenance of piers, quays, landing slips, &c. For accomplishing these duties a moderate salary is given, and however large may be the county there is no allowance to the surveyor for his own or his assistants' travelling expenses. As some of the counties are divided, there are forty-three surveyors and one hundred and fifty-eight assistant surveyors. The roads under their superintendence measure over 51,000 miles, which are maintained by an annual outlay that is small if compared with England. The cost of supervision is 5·28 per cent. on the expenditure. It is plain therefore that the surveyors are guardians of economy without much advantage to themselves. It is not their fault if they are compelled to have recourse to methods that an English road surveyor, although he may only have a farmer's experience of work, would consider to be primitive. The Grand Jury, who make all the fiscal arrangements, are not authorised to purchase steam-rollers, tools, instruments or appliances of any kind. If a stone depôt has to be formed for materials, the cost must not exceed twenty shillings. The contractors, on the other hand, have reason to grumble, for they are paid only twice a year, and as the lowest tender must be accepted, they can never anticipate much profit for their enterprise. As a result, the wages paid are at the lowest, and it is no wonder the men who break stones or mend the roads get through their tasks in a manner that annoys every English traveller who passes by, and who concludes from what he sees that the Irish labourer is slothful.

Perugino died of the plague in 1523, and as yet there is not even a humble memorial of him in any part of Italy. Fortunately he left a portrait of himself in the Sala del Cambia of the city from whence was derived the designation by which he is known. There are also works enough by himself and his pupils to preserve his reputation from oblivion, although connoisseurs may not, like the cousin in the "Vicar of Wakefield," make it a rule to set up Perugino as a sort of standard. At last an effort is to be made by the Italians to show that they have not entirely forgotten the master who taught Raphael. It is intended to raise some kind of monument in Perugia to the memory of Vannucci if money can be raised; but the Italians are shrewd, and are likely to say to the committee that if the painter's name has remained among the renowned for nearly four centuries without the aid of statues or fountains, it may manage to be remembered while the world lasts.

The Americans have discovered the advantages of living as high as possible above street noises and in pure air. It appears that the last year's receipts from the tenants of the tower of the new auditorium in Chicago amounted to nearly 16,000*l.* An offer of 10,000*l.* a year has been made to the committee of the Masonic Temple of Chicago for the apartments in the roof. At that rate a large return is expected to be derived regularly after the visitors to the World's Fair have departed. During the fair there will be enough people to pay for reaching the height a larger sum than 10,000*l.* The owners of old buildings in German towns, where the vertical measurements of the roofs are sometimes not less than that of the house to the springing, must often wish that a similar fashion prevailed in Europe, for in most cases the space within the roofs is useless. A cheap system of lifts that could be readily applied might, however, enhance the value of many a German and Dutch house.

The latter years of Louis Gallait's life, it is said, were embittered because he was not elevated to the peerage. An artist who, according to some, was the foremost of the painters of Belgium would not gain much by becoming a Belgian baron, but men of genius are not exempt from the weaknesses of ordinary mortals. His townsfolk of Tournai have now before them in the esplanade of the park a statute of Gallait, who appears standing in the costume he commonly wore in his studio. It is the work of M. Charlier, a young sculptor. Gallait was born in Tournai in 1810, and it was not long before he proved his competence as a painter of history. He was fond of scenes from Flemish history, and his picture of the visit of the Spanish governor to the chamber where the decapitated corpses of Egmont and Horn were lying excited more interest than any other modern work in Belgium. But he was not confined to that class of subject. His *Temptation of St. Anthony* made compensation for the unsatisfactory versions of the legend which Flemish painters formerly produced, and his figure of *Louis XVII.*, who was seen crouching in a corner after illusage by his shoemaker-master, was impressive enough to be used as a text by the late Prince Consort for a little sermon to his sons. It may be doubted if Gallait's fame will endure. His execution produced such smooth pictures that people say there is no vigour in his work, and his best paintings are not to be compared with those of Albrecht de Vriendt's, the worthy head of the historical school of Belgium.

NK PHOTO SPRAGUE & CO 4 & 5 EAST 19 AVE



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BULLER'S WOOD, CHISLEHURST: ENTRANCE FRONT.

ERNEST NEWTON, Architect.



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BULLER'S WOOD, CHISLEHURST: ENTRANCE FRONT.

ERNEST NEWTON, Architect.

The Architect, Oct 2nd 1891.



INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

BULLER'S WOOD, CHISLEHURST: STAIRCASE.

ERNEST NEWTON, Architect.

Trinity : U:P: Church :: Pollokshields :

W·G· Rowan ÷ Architect ·




Anne Gibbon . Del

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ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

BULLER'S WOOD, CHISLEHURST, [ERNEST NEWTON.]
NOS. 412 AND 413.—ENTRANCE FRONT. NO. 414.—DRAWING-ROOM. NO. 415.—STAIRCASE.

TRINITY U.P. CHURCH, POLLOCKSHIELDS, GLASGOW.

THE site of this church, which was opened a fortnight ago, is one of the finest on the south side of the Clyde, the ground being 15 feet to 20 feet above the road levels. The church is planned as nave and aisles, with a recess 20 feet deep and full width of nave, in which is placed the organ. The communion-table takes the centre position in the choir, in front the elders' and choir seats being ranged right and left, and the minister's chair at the table making a good screen for the organ-player. The whole of the fittings and furnishings of this part of the church are richly designed and carved in solid oak, and being lightly stained agree very well with the polished ashlar red stone lining the walls. In the windows above the organ there are some good bits of stained-glass. The nave arches are carried by Peterhead granite piers, with richly-carved stone capitals and moulded bases. The gallery front, wall linings, doors and their finishings, pewing, &c., are all good examples of their kind, showing an amount of care and thoughtfulness in detail not by any means common in our everyday, moderately-priced church work. The pulpit and the font —the latter not yet finished, however—surpass in richness of design and colour, and in the rare skill and art-craftsmanship put forth by the carvers upon them, all the other fittings with which the church has been so handsomely gifted. Built of Corsehill red sandstone, with green marble shaftings in the upper and lower stages, the panels of the upper stage are filled with beautiful examples of onyx finely marked in colours, and so transparent in parts that light could be seen through about a thickness of an inch where only one face was polished. The coping is wrought in richly-coloured alabaster with a good effect of transparency in it, and selected for its soundness as well as colour. The varying tones and colours of the marble, alabaster and onyx have a rich setting in the red sandstone cusped and carved traceries of the canopied work which surrounds and partly encloses them, apart from the foliated string-courses and crocketed terminals of the inner shafts of the lower stage. The book-rest is of black hammered iron, richly wrought with well-modelled work of a vine-leaf pattern. The massive high-backed and gabled chair is wrought in solid oak, ornamented with cusped traceries and richly carved. Altogether this church may fairly mark a step in advance in the treatment of the interiors of United Presbyterian churches at any rate, and it is creditable to the taste and liberality of those in authority that this is so, and that the architect was practically allowed a free hand in the arrangement of what must be regarded by many as a novel and artistic interior. The gasfittings, of black hammered iron, wrought mostly as pendants, but with a few wall brackets, have been made by Messrs. James Milne & Son, Glasgow and Edinburgh. Messrs. Dawson & Sherriff, Glasgow, were the carvers, and did the pulpit, &c.; Mr. James Morrison, joiner, did the oak fittings; and Mr. Crawford did the oak carvings. Mr. John Sim was the clerk of works, and Mr. W. G. Rowan, 234 West George Street, Glasgow, was the architect from whose drawings and details the whole work has been completed.

STANDLAKE CHURCH.

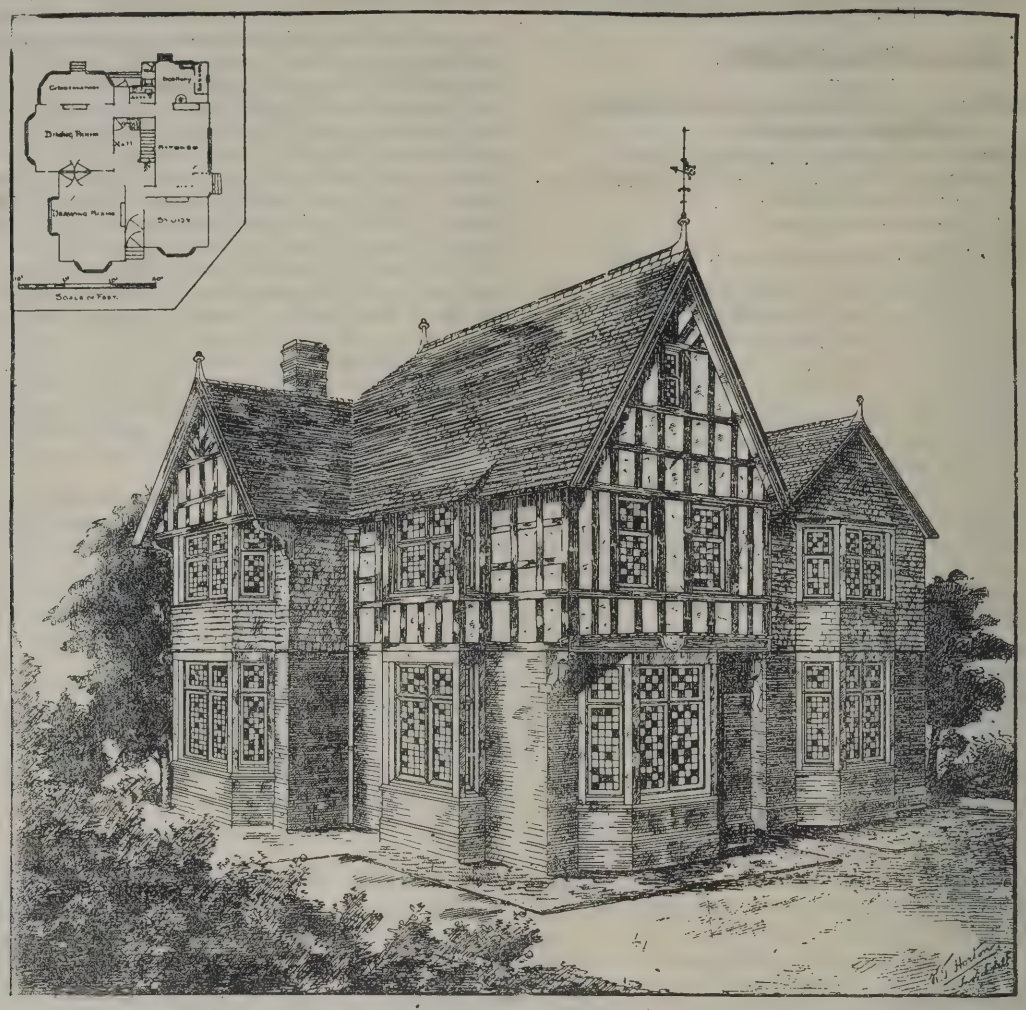
THIS building has just been restored by Mr. Barnes, builder, under the supervision of Mr. Clapton C. Rolfe.

Standlake Church is, the *Oxford Chronicle* says, five miles or so from Witney, close by the river Windrush, and lower than the level of the water. This edifice is dedicated, some affirm, to the Glory of God and of the Holy Cross, but it is more probable that St. Giles is the patron saint to whose especial honour the original building was erected. It has been pronounced by a well-known authority to be "one of the most beautiful amongst the groups of churches of the upper Thames." It is eleven years ago since the present rector, the Rev. Lewis S. Tuckwell, first commenced the restoration of the venerable pile, much of which dates from the thirteenth century, and the work was begun, as it has now just been finished, from the designs of Mr. Clapton Crabbe Rolfe, Holywell Ford, Oxford. The first section (the nave) was dedicated, after renovation, in 1881, and two years afterwards the south aisle and transept were restored, and four years later the five bells were rehung, and a new one added to the belfry in the quaint old western tower. The north transept and adjoining aisle were restored in 1888, and now through the earnest exertions, and greatly through the munificent liberality of the rector and his personal friends, the chancel has been partly rebuilt and most conservatively restored, so that, at last, the work that has so steadily gone on for all these years (at an outlay of something like 6,000*l.*) is completed. Perhaps the greatest glory of Standlake Church is the unique character of its sumptuous oak carving, the greater part of which is figure work. Indeed, in the body of the church, the story of the saints in the English Calendar is vividly told by the representations of many of their number, carved on the various bench-ends.

In the chancel two Late Perpendicular (fifteenth century) windows have been blocked up, and in their places two thirteenth-century ones, that have been discovered during the progress of the restoration, have been opened out. The roof is entirely new and of most massive character, all of English oak and richly carved. Amongst the timbers occur a number of almost life-sized angels, crowned and with wings fully extended. These play musical instruments, and the roof itself is supported on sculptured stone corbels, representing other angels, also with musical instruments of ancient type in their hands. The motive for this, as it were, celestial choir, has been the well-known minstrel gallery at the Exeter Cathedral. The roof is one of the finest, if not the very finest, in any country parish church in the country.

THE GROWTH OF GLASGOW.

AT the last meeting of the Dean of Guild Court Dean Ure said as that was the last Court at which he would preside, he took the opportunity of making the annual statement of the business engaged in during the last twelve months. The only thing that made it differ from the immediately preceding years was that the number of linings asked for exceeded those of any of the years since 1878. In some of those intervening the aggregate value of the buildings authorised exceeded the computed amount of those which had this year been passed. That was notably the case in 1883, when the Municipal Buildings were authorised. The total value of that year's work was 697,000*l.* This year it amounted to 590,810*l.* In the two years of his deanship buildings had been authorised the cost of which was computed at over a million sterling. During last year they examined and passed the plans of several public buildings—halls, churches and schools—the value of which was about 50,000*l.*; houses and shop property to the value of 233,500*l.*; warehouses, stores and workshops to the value of 179,000*l.*, and alterations and additions amounting to 68,300*l.* The dwelling-house property authorised was fully 300 occupancies more than in the previous year—1,561 was the number this year, as against 1,253. He was glad to say that the excess of this year was all in the better class of workmen's houses. Of single apartment houses there were only 230, as against 321 in the previous year; 778 of two apartments, against 666 in the year before; of three-apartment houses 474, against only 191 in the previous year; of four apartments and upwards there were 79 houses last year, and 75 in the year before. It might appear singular to those not acquainted with our circumstances that in this great and wealthy city the number of small houses now being built was still so great as compared with those of larger size. Of course the explanation was that the eligible sites within the city for better-class houses had already been taken up, and builders had now to go outwith our present bounds. As an evidence of that he found, looking back to the work of this Court some sixteen or eighteen years ago, that there were many more houses being built in the city then of six rooms and upwards than there were now. The Master of Works had furnished him with a memorandum of yearly linings granted by the Dean of Guild Court from September 1, 1872, down to the present time, and he found from it that within the first five years ending in 1887 there were linings granted for 300 houses of six rooms and upwards, whereas during the last five years there had only been the plans of 32 houses of such sizes presented to the Court, and in the past two years only three of over five apartments. He was sure they were all glad to know that the cause of this anomaly would now cease—the great annexation of territory accomplished last session of Parliament extended the city bounds in November next over much land most suitable for building these better-class houses upon, and he had no doubt that his successors in this chair would for many years to come have an increased number and higher standard of house property to report.



Residence at Ashford, Kent: for H. Horton Esqre. W.T. HORTON. ARCHITECT.

LANDLORDS AND LEASES.

THE following additional letters on this subject have appeared in the *Times*:—

Mr. Sextus Dyball writes:—My letter, for which you kindly found space a few days since, seems to have been misunderstood by those whose replies you published on Saturday. The remarks of the riparian house agent may, I think, be passed over. His experience in dilapidations must be of the most elementary character, or he would know that, whether acting for landlord or tenant, a surveyor is bound by the four corners of the lease, which either clearly lays down or implies the extent of the tenant's liability. His insinuations induce me to quote the utterance of the judge who, when it was represented that a defendant would be ruined and for ever impoverished if a certain action could be maintained against him, answered, "What is that to us? It is better that he should be entirely ruined than that the law should be changed for him." That, I take it, is the spirit in which any professional man worthy of the name would look after his client's rights. The remaining letters I have read with interest, tempered by regret that the writers should have failed to grasp the point which I raised. "F. S. I." complains that the growing tendency of the age is to rebel against the very principle of repairing leases—a statement in which I heartily concur, although from the standpoint exactly opposite to that which he takes up. The very essence of my argument is that the covenant to repair is not a covenant to improve the building, or even to keep and yield it up in as perfect a state as when demised, the tenant being bound only to take care that it does not suffer more than the natural operations of time and nature would effect. That is the equitable construction of the law of dilapidations, upon which I maintain the repairing covenants in leases were formerly based. Compare it with the covenant quoted in my first letter. Can "F. S. I." show me such a one in any ordinary lease of forty or fifty years back? Will he contend that inside painting, papering, colouring, flatting, graining, marbling, gilding, varnishing, decorating and French polishing during the last three months of the fifth or seventh, fourteenth and twenty-first years of the term are necessary for the upholding and maintenance of the structure? He says that the landlord only asks the tenant to give him back his house in the same state as it is delivered over; but I would ask, For what purpose does the tenant take the house—to shut it up in a glass case or to live in it? If the latter, does he not pay a full rack-rent for the privilege of using and occupying it? And if he uses and occupies it in a reasonable manner, and takes care by the proper execution of repair that it does not become more depreciated than it necessarily would from such reasonable use and occupation, or from the natural operation of time, what more ought to be expected of him under the old and equitable construction of a tenant's liability? Of course, a landlord has a perfect right to make the best bargain he can, and the same right appertains equally to a tenant. With a legal contract nobody can interfere, although, undoubtedly, as "F. S. I." points out, tenants, from either sheer ignorance or carelessness, frequently do sign leases without giving any heed to essential conditions of the structure. I agree with him as to the "schedule of defects," although, strictly speaking, even that would be of little avail if the covenant should be to keep and leave the premises in repair, it having been held that a tenant is not in the position to do that unless he first puts them into repair. "H. T. P." inquires if I want a landlord to let his house at less than the market value. To that I reply, Certainly not, nor do I find it done. What I protest against is that the landlord should agree to let his house at what I maintain is a full rack-rental, and then endeavour to saddle the tenant with an additional and unjustifiable liability of at least 25 per cent. of such rental. The example mentioned by "H. T. P." proves nothing. Had his property increased instead of depreciated in value, he would of course have had the advantage of the increase, similarly as he now has to submit to the reduction. That, I take it, is one of the penalties of property ownership, but if it would be any consolation to him to know that he is not alone in the boat, I can refer him to a case in which I am now acting for one of the parties concerned, and where a lessee, who holds an unexpired lease of a house at 570*l.* a year, upon which he has spent hundreds of pounds in improvements, being desirous of disposing of it, finds that the best terms upon which he can do so are to assign the lease at a reduced rental of 475*l.* and to pay the superior landlord the difference between that amount and the original rent of 570*l.*

Mr. W. W. Baldwin writes:—My experience of many years in leases and the assessment and settlement of dilapidations suggests to me several points in the relationship between land-

lord and tenant which appear to throw the balance of favour on the side of the tenant, rather than on that of the landlord. Your correspondent seems to have overlooked the facts that—first, the premises are put into complete structural and decorative repair at the commencement of the term; that about 20 per cent. reduction is made on rentals under repairing leases; that short leases are now general; that tenants are yearly becoming more exacting in their requirements, and that landlords are consequently obliged to expend larger sums in decorative and other works. Under these circumstances it cannot be said that, and especially under a short lease, the covenant to paper, paint, decorate, &c., in the last year of term is unreasonable, and I fail to see in it any argument in support of your correspondent's assertions as to "the increasing one-sidedness of the covenants (in leases) in favour of the landlord."

AMERICAN LAW OF ARCHITECTURAL SUPERINTENDENCE.

A SERIES of articles on "Architect, Owner and Builder before the Law" is appearing in the *American Architect*. Among the reports given is the following, in which the law as respects superintendence is more clearly explained than is common in American judgments.

Messrs. Hubert, Pirsson & Co. were architects of a building called the Mount Morris Apartment House in New York for Mr. John W. Aitken. The total cost of construction was 118,000 dols. The action was to enforce a lien for the architects' services. The defendant set up a counterclaim for alleged negligence on the part of the plaintiffs, resulting in defects, omissions and mistakes of contractors and workmen. The case was tried first before a referee, who found for the plaintiffs, for the full amount claimed, and an appeal was taken to the full court.

In announcing the decision of the court Judge Van Hoesen said:—"The learned referee, in answer to the request of the defendant, has found that the sectional area of the boiler-flues" (probably tubes) "for the building was 404 square inches; that the sectional area of the chimney-flue designed to receive the smoke and gases from the boiler-flues was, at its base, where it was entered by the boiler-flue, 272 square inches; that the area provided by the said chimney was inadequate for the service of the said boiler-flues; that by reason of the inadequacy of the said chimney-flue the proper combustion of the coal in said boiler fires could not be secured; that to supply the deficiency of chimney-flue the defendant will necessarily and properly be required to build a new chimney-flue on the outside of said building; and that the necessary cost and expense thereof will be 1,000 dols. But the learned referee was of opinion that the plaintiffs were not liable to the defendant for the expense of supplying the deficiencies of the chimney, because, though architects by profession, they are not experts in steam-heating, and, to use the referee's language, 'all that was required of them was that they should confer with whoever became the contractor for the steam-heating, and ascertain what dimensions were required for the chimney-flue to afford a draught for the heating system. This they did, and Tudor, the contractor for the steam-heating appliances, gave the dimensions. While it is obvious that this chimney was insufficient, the responsibility should rest upon the person who committed the fault.'

"I am unable to agree with the referee in his conclusion. The plaintiffs are architects of standing, who assume to be able to plan and superintend the construction of first-class apartment-houses, to be heated by steam, and to be provided with every convenience demanded by the luxurious tastes of the day. They are not architects in a rural community, but in the first city in America. Steam-heating is, as we all know, common, if not a necessity, in all apartment-houses of large size and of a high class. It is true that houses of this description are of recent introduction, but they are now a very important part of our system of economics, for in some of the new streets they are more numerous than private residences or tenements of the kind that formerly were in vogue. The architect who undertakes to construct a house that is to be heated by steam is groping in the dark unless he knows how large a chimney is required. It is as necessary that the architect should know what is needed to make the steam-heating apparatus serviceable as it is that he should know how sewer-gas is to be kept out of the house.

"No one would contend that at this day an architect could shelter himself behind the plumber, and excuse his ignorance of the ordinary appliances of sanitary ventilation by saying that he was not an expert in the trade of plumbing. He is an expert in carpentry, in cements, in mortar, in the strength of materials, in the art of constructing the walls, the floors, the staircases, the roofs; and is in duty bound to possess reasonable skill and knowledge in all these things; and when, in the progress of civilisation, new conveniences are introduced into our houses, and become, not curious novelties, but the customary means of securing the comfort of the unpretentious citizen, why should not the architect be expected to possess the technical learning respecting them that is exacted of him with respect to other and older branches of his professional studies? It is not asking too much of the man who assumes that he is competent to build a house at a cost of more than 100,000 dols., and to arrange that it shall be heated by steam, to insist that he shall know how to proportion his chimney to the boiler. It is not enough for him to say, 'I asked the steam-fitter,' and then throw the responsibility of any error that may be made upon the employer who engages him, relying upon his skill. Responsibility cannot be shifted in that way. . . . I am of opinion that the defendant should be allowed to deduct from the plaintiffs' demand against him the cost of correcting the defects in the chimney—1,000 dols. I have read the appeal book through with care, but find nothing that warrants us in allowing a further deduction from the judgment."

The case was subsequently reargued. In announcing the decision, which confirmed the former one, the Chief Justice, Larremore, said:—"The point upon which chief stress was laid in the reargument of this appeal was that of the entirety of the contract between the parties. The plaintiffs are architects, who agreed to draw the plans for, and also according to the custom of the profession, supervise the construction of the building referred to in the complaint. It appears that there was one grave fault in said plans, and that there were some quite serious departures from the specifications and from the best workmanship in the erection of said building. The learned counsel for the appellant therefore argues that the architect has not completely performed his contract, and that as said contract was an entire one for professional skill and services, and not a divisible or apportionable one, no recovery can be had, and the complaint should have been dismissed. But a very simple analysis will show that this construction is founded on a misconception. With regard to the plans, it appears that the contract was completely performed. Drawings for the whole building were furnished, and it was actually constructed in accordance therewith. After the building was finished it was discovered that the chimney-flues connecting with the boiler-flues were not large enough for the purpose for which they were designed. These flues were not omitted from the plans; on the contrary, they were set down with the same fulness of detail as the other parts of the building. It cannot therefore be said that the plaintiffs did not entirely perform their contract in this respect. They completely performed it, but they performed it negligently.

"Similar considerations apply to the other branch of the case. The learned counsel would not claim that an architect is bound to spend all his time at a building which is going up under his professional care, so that no fraud or negligence can be committed by any of the contractors. The counsel would not contend that the architect is an insurer of the perfection of the masonwork, the carpenterwork, the plumbing, &c. He is bound only to exercise reasonable care, and to use reasonable powers of observation and detection in the supervision of the structure. When, therefore, it appears that the architect has made frequent visits to the building, and in a general way has performed the duties called for by the custom of his profession, the mere fact, for instance, that inferior bricks have been used in places does not establish, as matter of law, that he has not entirely performed his contract. He might have directed at one of his visits that portions of the plumbingwork be packed in wool. Upon his next return to the building the pipes in question might have been covered with brickwork in the progress of the building. If he had inquired whether the wool-packing had been attended to, and had received an affirmative answer from the plumber and the bricklayer, I am of opinion that his duty as an architect, in the matter of the required protection of said pipes from the weather, would have been ended. Yet, under these very circumstances, the packing might have been intentionally or carelessly omitted in fraud upon the architect and owner, and could it still be claimed that the architect had not fully performed his work? The learned counsel for the appellants is in effect asking us to hold that the defects of the character above named establish, as a matter of law, that the plaintiffs have not fully performed their agreement. An architect is no more a mere overseer or foreman or watchman than he is a guarantor of a flawless building, and the only question that can arise in a case where general performance of duty is shown is, whether, considering all the circumstances and peculiar facts involved, he has or has not been guilty of negligence. This is a question of fact and not of law.

"Upon reconsideration I am more firmly convinced of the correctness of our conclusions reached after the former argument. The defect in the plans which led to the construction of too small a chimney was something for which the plaintiffs, and no one else, could be held responsible. For the reasons so cogently stated in Judge Van Hoesen's opinion, the plaintiffs were, as a matter of law, guilty of negligence in falling into this grave error. In analogy with the rule adopted in ordinary contractors' cases we deducted from the sum due under the contract

the amount of damages caused by such negligence, and directed that the plaintiffs either take judgment for the balance, or suffer an absolute reversal. As to the conceded facts of malconstruction and use of inferior materials, the referee has decided, on sufficient evidence, that the same were not properly attributable to the plaintiffs' negligence, and we can discover no reason for disturbing his findings. The order entered after the former argument must in all respects stand."

In this very recent and important case, the duties of the architect, and the distinction between them and those of the contractor, are laid down with great clearness and precision, and, on the facts as presented, even architects will probably acknowledge that strict justice was done; but, so far as the report indicates, the facts were presented with a singular carelessness of the interest of the plaintiff. The referee's finding, based of course on the evidence offered him by both sides, made it appear that the scientific rule for proportioning boiler-chimneys, which the architects ought to have followed, was to make this area of the chimney-flue equal to the combined area of the boiler-tubes, and, as it was easily proved that the area of the flue was less than that of the tubes, he assumed, and the judges of course followed his conclusion, that the architects had neglected to comply with a scientific rule which they ought to have known and followed. Now, in point of fact, there is no such rule. It is not uncommon for ordinary mechanics, of the sort that the judge contemptuously called "steam-fitters," to use such a proportion, which is easy of application, and gives a flue which, if too large, can be reduced by partly closing the damper; but this practice has no scientific basis whatever. On the contrary, the rules given in the books usually concern themselves only with the ratio between chimney-flue and the grate-surface, without any regard to the area of the boiler-tubes. It is obvious that the amount of coal consumed, and the volume of smoke to be carried off by the chimney, are strictly limited by the grate-surface, and the proper capacity of the chimney is that which, taking into account the proportion of openings to solids in the grate, and the resistance offered to the passage of air by the coal, as well as the height of the chimney and the estimated velocity of the flow through it, will carry off the products of combustion freely.

In many cases, probably, there is an excess of tube-area in the boiler over that required by the grate-surface, so that most of the smoke passes through a portion of the tubes; but the chimney can evidently draw only so much air as the grate-surface supplies, whatever the tube area may be. What the grate-surface in this case may have been no one seems to have inquired, and, although it does not follow that the chimney was really large enough for its purpose, or that the architects may not have been at fault in some other way, the record represents them as having been fined a thousand dollars for having neglected to observe an imaginary rule, which is unknown to science, and has no foundation in reason or authority.

Moreover, the court reproached the architects for having deferred to the judgment of "the steam-fitter" in designing their flue, instead of following the guidance of their own "technical learning." So far as the facts were presented to the court, this point was well taken; but it does not seem to have been anywhere suggested, on behalf of the architects, that Mr. Tudor, far from being a mere "steam-fitter," was one of the most accomplished experts in steam-heating in the United States. If the architects had felt any doubt about the proportioning of their chimneys, or in regard to any other point in the heating of their building, it would have been their duty, in their client's interests, to consult exactly such an expert as Mr. Tudor, and to follow his advice, in preference to their own opinion, and they might justly have been accused of negligence if they had failed to do so; while Mr. Tudor's position as the contractor for the heating apparatus gave his opinion the additional weight to be derived from special familiarity with the problem, and a personal interest in the successful working of the apparatus.

It seems hardly possible to doubt that these considerations would have had a very important influence in modifying the decision of the court if they had been brought to the attention of the referee, and through him to that of the judges, but there is no indication in the report that they were presented at all. On the contrary, the referee thought, although the court did not agree with him, that it was the duty of the architects to "confer with whoever became the contractor for the steam-heating," and that if they did this their duty was fulfilled, no reference whatever being made to Mr. Tudor's exceptional position as an expert of the highest rank.

Another point which seems to have been neglected by the counsel for the architects was the proof of the necessary cost of remedying the deficiency in the size of the chimney, if it really existed. Every architect knows that the insufficiency of a flue, in cases where heating systems are changed, is often remedied by connecting another spare flue, perhaps a ventilating flue, or one intended for stoves, with the boiler, so as to give the boiler two flues instead of one. This arrangement works perfectly well in most cases, and costs only a few dollars; and the architects, even if their negligence were proved, could only be held liable for the cost of the cheapest reasonable method of remedying the defect due to their fault; but no attempt appears to have been made, on behalf of the architects, to devise such a method, and the defendant's estimate of the probable expense of remedying the alleged trouble appears to have been accepted without question.

The whole story shows how extremely technical cases concerning architects usually are, and how difficult it is to have their side properly placed before a court, even in a community so familiar with professional work as New York. In other places, where architects are little employed, the temptation to confuse their functions and responsibility with those of the builder is still strong.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE members of this Association paid a visit to the house erecting in Great Western Road for Mr. A. P. Anderson, and of which Mr. T. L. Watson, F.R.I.B.A., is architect. Among many fine residences it takes a conspicuous place. The style adopted, English Gothic of the sixteenth and seventeenth centuries, causes a marked though not inharmonious contrast with its Classic neighbours. Picturesque grouping and variety of form is obtained by tall chimneys, many gables and timber-work; colour by the red stone of two shades, ornamental brick filling—cement also—of timber quarterings, green slates and tile ridgings and crests. Internally the chief features of interest are the hall and the staircase. The former is a large apartment rising the height of two storeys, with an open timber roof, a gallery of woodwork at one end, space for a large organ, and a fireplace recess with hooded stone chimneypiece. The staircase has stone arcadings, both large and small, enriched with carving and diaperwork. Mr. Wishart, clerk of works, conducted the party and gave all necessary explanations.

VILLAGE SEWERAGE.*

IT appeared to our fathers that the speediest, most natural and most effectual method of disposing of sewage was to pour it into the nearest river or stream, regardless of whether the water, or any quantity of it, was likely to be taken by villagers further down for domestic purposes, and this method, unfortunately, obtains generally throughout the length and breadth of the land. To this state of affairs we have the following objections brought prominently before us:—(1) That it is illegal to pollute streams; (2) that it is antagonistic to public sentiment; (3) that it is injurious to public health. Any one of these objections would cause district committees to hesitate before proposing to execute drainage works which have, as an element, the disposal of filthy liquid into a limpid stream; but if all three objections are established, no such scheme would get beyond the standing joint-committee of a county council. The third objection, if proved, would of course be the most fatal; and in this connection I shall refer to a few expressions of opinion which were made public recently. According to the *Deutsche Bauzeitung* (February 18, 1891), a remarkable investigation was made by Professor Pettenkofer of the river Isar, between Munich and Freising. Observations were made during a time when the river was in flood, and also last winter when it was abnormally low, and, consequently, when the proportion of the fæcal matter, in relation to volume, was greatest. The relative volume was as follows:—At lowest level, 50 cubic mètres per sec.; at mean level, 189 cubic mètres per sec.; at highest level, 359 cubic mètres per sec.

A comparison was made between the amount of oxygen that was required to destroy the organic substances in the water when the river was at its lowest level, and the amount that was required when it was at its highest or in time of flood, and the observations of Professor von Pettenkofer led him to conclude that the water was much freer from pollution when the river was low than when it was in flood. He affirms that he does not think that evil results follow the discharge of raw sewage into the river, retreats from the contrary opinion which he formerly held, and undertakes to prove that bacteriological investigations do not support the theory that harm is done to the river by the discharge of sewage. Munich is a town with 270,000 inhabitants. In reading a paper before the Engineering Section of the London Congress of Hygiene last month, Mr. Baldwin Latham, C.E., said:—"The experience in India in connection with the water supplies taken from rivers shows that the rivers undergo a process of purification, and that the waters taken from them

* A paper by Mr. J. D. Watson, county sanitary inspector of Aberdeenshire, read at the meeting of the Sanitary Association of Scotland.

after a sufficient length of flow and proper filtration, are amongst the most wholesome supplies in the country, as the case of Calcutta fully demonstrates." And yet he adds :—"The running streams of India, to which the natives have access, are polluted from their sources downwards, but, as a rule, the districts supplied from running streams are healthier than those drawing their water supplies from either tanks or wells."

Against these opinions we have evidence from Professor Robinson, C.E. ; Mr. Binnie, chief engineer to the London County Council (who has had considerable experience as a water engineer in India); and also from Professor Frankland, who read at the Congress a valuable paper on "The present state of our knowledge concerning the self-purification of rivers," in which he quoted the experiments of the Rivers Pollution Commission on the Irwell, Mersey, Derwent and Thames, and his own experiments on the Thames and Ouse, to show that all these experiments negative the theory of self-purification as regards dissolved organic matter, although unmistakable improvement is traceable in the case of suspended matter. He also referred to the experiments of Hulwa, on the Oder, near Preslau ; Frank, on the Spree, at Berlin ; and Pransnitz, on the Isar, at Munich. Hulwa supports the theory of self-purification, Frank limits it to suspended matters, and Pransnitz adopts an intermediate view. Dr. Frankland also pointed out that unanimity exists with regard only to self-purification by sedimentation, a process which can never guarantee the absence of danger, inasmuch as a flood is liable at any time to disturb the bed of a stream in such a manner as to raise the microbes which had there obtained a lodgment. He held that of the removal of dissolved organic matter there was no evidence. In the discussion which followed there was very general assent to the views expressed by Dr. Frankland.

It must be admitted that the bulk of the chemical evidence leads to the conclusion that there is real danger in drinking water which has been polluted by sewage, and that the elements of danger are only lessened, not destroyed, by rendering the sewage inappreciable from its uniting with a great body of pure water. But even if it were established beyond question that a water once polluted may be rendered altogether innocuous by natural or artificial means, public opinion is so powerful and frequently so fastidious that it would be difficult to persuade a community to use a water for domestic and dietetic purposes which was well known to be contaminated with foul matters. An eminent analytical chemist (in reporting upon the question of whether it was deleterious to a pure stream to allow a quantity of sewage to flow into it) arrived at the conclusion that the contamination was altogether inappreciable some distance down the stream, and that the water might safely be used for drinking purposes, but, in reporting his conclusion, he described the bed of the stream so minutely at the place of pollution, detailing the appearance of sewage particles, *vorhiellidæ* and *tubifix rivulorum*, in such a manner that the report, instead of having a reassuring effect, created prejudice against the waters of the stream. While I distinctly deprecate supplying a village with the water of a stream which has been contaminated in its upper reaches when it is possible to obtain water from an undefiled source, I attach so much value to the provision of an abundant supply of soft water for dietetic, cleansing and flushing purposes that I should weigh very carefully the chances of danger to health from using water in which an occasional microbe or spore may be found against the certainty of the danger to health from ill-flushed sewers and personal uncleanliness. If it depended altogether upon the question of whether water which had been polluted by sewage can under any circumstances be used as a drinking water, we might not be called upon to deal with the subject immediately, but the law enacts that "every person who causes to fall or flow or knowingly permits to fall or flow or to be carried into any stream any solid or liquid sewage matter shall (subject as in the Act mentioned) be deemed to have committed an offence against this Act." The qualification referred to in the clause (of the Rivers Pollution Act) is to the effect that if the accused shows to the satisfaction of the Court that he has used the best practicable and available "means to render harmless the sewage matter so falling or flowing into the stream" he shall be acquitted. It is quite evident, of course, that both questions are inseparable, inasmuch as a district committee or a county council would hesitate to enforce the provisions of the Act against anyone (more particularly themselves) unless they were satisfied that there were tangible reasons for so doing.

The main question therefore for consideration is, what is the best practicable and available means of rendering harmless sewage matter? In Aberdeenshire we have been for several months deeply interested in the question of the pollution of the river Dee, and by instruction I prepared a report upon the best means of rendering sewage harmless. In that report (a copy of which I lay on the table) I stated at the outset that the conclusions at which one arrives depend almost altogether upon the sources from which his information has been drawn and the experiments that have come under his notice, and that I had therefore deemed it advisable to communicate with a large number of small communities both in England and Scotland, in order to ascertain the exact condition of matters at the present time. Four hundred circular letters were sent out, and 182 were returned with answers to our queries. From the replies which we received 86 were tabulated and printed, and these were selected for the simple reason that the others (96) were for the most part statements to the effect that the sewage of the places to which they referred was allowed to gravitate towards the neighbouring streams without treatment of any kind. The following is a summary of the replies received :—

At fifty places irrigation is adopted in one form or another, and sewage in its crude state is applied to the land. At twenty-four places precipitation is adopted, the following systems being used, viz. Alumino-ferric (4), the "Amines" process (1), Hillë's fluid (1), chloride of lime and iron (1), lime (7), ferozone and polarite (4), Smith's sodium process (2), sewage is said to be treated chemically (4). At six places natural or mechanical subsidence is adopted, and the effluent is thereafter passed into a river or on to a small piece of land. At two places mechanical filtration is adopted. At six places the dry closet system is adopted. At one place cesspools are in vogue.

It should be mentioned that requests were made for replies to our queries only where the town or village was believed to have a population of 20,000 or under. The reason for this restriction was that a town of 100,000 inhabitants might have found a particular manner of treating a large quantity of sewage quite satisfactory when similar treatment would have been quite unsatisfactory in the case of a small town or village ; or, conversely—and perhaps more correctly—a place of 1,000 inhabitants might dispose of its sewage by, say irrigation, when a town of a hundred times that size would find such a course perfectly impracticable. This rule was disregarded only in a few exceptional cases, which I had learned were actually making a profit out of the disposal of their sewage. I therefore made special inquiry, eliciting the information that profit is hardly ever to be thought of in connection with the effectual disposal of drainage water, and where profit has been made it invariably was the result of good "sewage farming."

I beg to notice a few points which occur to me as particularly worthy of attention in the returns which we received, and as bearing directly upon the problem which will present itself to a local authority when it is called upon to take up the subject of river pollution :—

1. It is an important fact that of the 182 replies which we have got, nearly one hundred local authorities do next to nothing to purify the sewage of the town or village they govern. This seems to indicate that neither the Local Government Board in England nor the Board of Supervision in Scotland have been active in causing local authorities to carry out the provisions of the Rivers Pollution Act ; and it may safely be inferred that local authorities have taken action only when the health of the community generally was suffering by the sewage contamination, or when proprietors of the streams affected, or others having *locus standi*, have sued for interdict in the law courts.

2. The decided preference for irrigation, in one form or another, as the most effectual means of disposing of sewage is one of the features of the returns. That this should be so is not surprising to me. Land irrigation is at once the most natural, the best and the cheapest method of disposing of town's sewage, unless, perhaps, when it is largely diluted with chemicals from manufactories, or when land for the purpose cannot readily be obtained.

3. It has to be noted that, in the comparatively few cases where precipitation is recommended, there is a great lack of unanimity in putting forward a particular system. Considering the fact that there have been several scores of patents taken out for purifying and rendering harmless sewage liquid, it is somewhat remarkable that so few of those patent processes are recommended by responsible surveyors and inspectors ; and it is also noteworthy that in no case where a particular chemical or method of precipitation has been recommended is that method of long standing—emphasising the fact that of those methods which have been put into practical operation, a limited number only have attained more than transitory existence ; and these returns again bear out in a remarkable manner the truth of the conclusions to which the Royal Commission on Metropolitan Sewage Discharge (Lord Bramwell's) arrived when they reported that "several processes appear to be fairly effective, but that there has been no evidence to satisfy us of the marked superiority of any one in particular."

4. A summary of the Appendix also shows that land irrigation is a much cheaper operation than precipitation, presuming, of course, that land can be got at a reasonable cost, and that it does not require too much labour to convert it into a fit condition for receiving sewage ; and it should not be forgotten that even clay soil is fit to be used for irrigation if properly prepared. One of the results of the Society of Arts conference on the health and sewage of towns (1876) was expressed by committee as follows :—"In certain localities, when land at a reasonable price can be procured with favour-

able natural gradients, with a soil of suitable quality and in sufficient quantity, a sewage farm, if properly conducted, is apparently the best method of disposing of water-carried sewage. It is essential, however, to bear in mind that a profit should not be looked for by the locality establishing the sewage farm, and only a moderate one by the farmer."

5. That the sludge precipitated is got rid of with difficulty, even where no charge is made for it. When farmers take it away, they do so at times convenient for themselves, and it frequently lies in great heaps for many months of the year. The chemical used for precipitation sometimes destroys the fertilising qualities of the sludge; occasionally, on the contrary, it is said to improve it, but, speaking generally, the sludge is hardly worth more than cartage from the tanks to the farm.

That improvements are likely to be effected upon the present systems of treating sewage by precipitation and filtration is more than probable, but in the present state of knowledge and experience there is little room for hesitating to accept the conclusion that the system of broad irrigation, assisted occasionally by intermittent downward filtration, is the most effectual, the cheapest and most generally suitable for the disposal of the sewage of our villages. It would be impossible to recommend any system which would be equally suitable to all towns and villages, as circumstances vary so much at different places, but when the following conditions obtain there need be little hesitation in adopting broad irrigation :—

1. Where land can be got at a convenient distance from the village.

2. Where the area of ground to be farmed is not less than one acre per 100 of population.

3. Where the ground is of an open or gravelly nature.

4. Where the gradients are suitable, both in respect of natural declivity from the village to the farm, and where the contour of the farm-land readily yields itself to being made an easy slope.

Where all these conditions unite, and the local authority are fortunate enough to obtain a good tenant, I shall expect that the works would more than pay interest on capital outlay. Seeing that it is quite impossible in a paper of limited length to treat the subject in an exhaustive manner, I have endeavoured to refer to those points which ought to impress themselves upon us before we form a judgment which will be subjected to the criticism of a county council and of the public.

THE JUNIOR ENGINEERING SOCIETY.

THE tenth annual general meeting of this flourishing society was held last Friday evening at the Westminster Palace Hotel, Victoria Street, Westminster, Mr. W. J. Tennant occupying the chair. A satisfactory report for the past session was read by the secretary, Mr. Walter T. Dunn, showing an increase in membership of 34 per cent. In consideration of the project for publishing the proceedings of the society and possibly opening a reading-room and museum, it was moved from the chair that the subscription of members over twenty-one years of age be increased. After a long discussion this motion was carried. Afterwards Mr. S. Boulding was elected president. An attractive programme of excursions and other arrangements is in course of preparation for the eleventh session. It is interesting to note that this society, founded ten years ago by half-a-dozen young engineers, has now over 260 members.

MEASUREMENTS OF LONDON BOARD SCHOOLS.

THE Works Committee of the London School Board have had under consideration the following report of the measuring-surveyor of the Board with reference to certain of the duties performed by him :—

As there are two important matters to which I think your attention and that of the committee should be drawn, I shall be glad if you will lay the following before them :—

Firstly, *re* measurements of foundations and drains. I see from the report of the committee on Goodrich Road School, p. 7, last paragraph, "That the measuring-surveyor shall measure the foundations," &c. &c., and on p. 8, first paragraph, "That all questions of drainage shall be similarly examined," &c. &c. Now, this work has been carried out, both in letter and in spirit, according to instructions in all works executed under the supervision of the assistant architect for buildings, but it has not been carried out in works under the assistant architect for repairs. I shall be glad of the committee's instructions as to whether I shall, or shall not, take the measurements of foundations and drains executed under the assistant architect for repairs, as I am now under the impression that the committee and the Board expect that this is being done by me. I need scarcely point out to the committee that it will necessitate additional assistance for that work alone. As it is, the measurement of foundations and drains takes the time, on the average, of considerably more than one man. Sometimes as many as five assistants are engaged on this work at once, having to put aside other work so as not to create an excuse for delay by the contractors.

Secondly, with reference to final reports, it has always to me been an unsatisfactory proceeding, for hitherto it has only been a superficial examination. I now feel that in the minds of the members of the Board there is so much weight attached to these reports that their superficial purport and character should be clearly grasped. Without hammer and chisel and workmen to cut and disfigure a new building, it is impossible to find out what is below the surface. I have not the least desire to shirk the responsibility in this or any other matter which the Board may put upon me; but I think it would be well that, for the purpose of these reports, the committee and the Board should understand there never have been any instructions given for an examination below the surface. In view of the importance attached to these reports, I feel that, for my own protection, I must ask for definite instructions as to the nature and scope of the investigations, and also whether they shall extend to contracts executed under the assistant architect for repairs.

After carefully considering the above statement, the committee have given the following instructions to the measuring surveyor and to the assistant architect for repairs :—"Measurements of drainage works executed under the assistant architect for repairs not to be taken by the measuring surveyor or his staff while the work is in progress, as the depths can be checked from the man-holes; but clerk of works to be instructed to keep a record of the widths and thicknesses of concrete laid under the drains, and also the width of the excavations for the same. Measuring surveyor to take the measurements of the depths of foundations and the thicknesses of concrete for the additions and alterations carried out under the assistant architect for repairs, and notice to be sent by the assistant architect for repairs direct to the measuring surveyor when the excavations have been approved by the former, and are ready for the dimensions to be taken. Measuring surveyor, when making final report, not to be responsible for work which has been covered up, and which cannot be tested without cutting about. No final report to be made upon work executed under the superintendence of the assistant architect for repairs."

GENERAL.

Professor Roger Smith will deliver the opening lecture of the coming session in connection with the classes for the study of architecture, construction and architectural drawing, at the college in Gower Street on Monday evening next, October 5, at 7·30 P.M. The subject will be "New Departures in Architecture."

A Portrait of Sir James King, ex-Lord Provost, painted by Mr. E. A. Walton, A.R.S.A., has been unveiled in the Council Hall of the Glasgow Municipal Buildings.

A Picture by Mr. Alma-Tadema—*Water Pets*—has just been added to the collection in the Wolverhampton Art Gallery.

Mr. Hamo Thorneycroft, R.A., has been asked to execute the proposed memorial statue of the late Lord Granville.

Mr. A. Hessell Tiltman has been successful in the competition for the new Westminster Bridge Road establishment to be erected by the Commissioners of Baths and Washhouses of Lambeth. This is the third consecutive victory of the architect within twelve months in similar competitions.

The Annual Convention of the American Institute of Architects takes place at Boston on the 28th, 29th and 30th of this month.

Mr. J. Harnett Harrisson, president of the Liverpool Architectural Society, will deliver his opening address on Monday, the 5th inst.

Mr. W. C. Lucy has been re-elected president of the Gloucester Science and Art Society.

The Autumn Meeting of the Bristol and Gloucestershire Archæological Society will be held at Gloucester on October 8.

The Plans of Mr. D. M'Millan, of Aberdeen, sent in in competition under the motto "Spero," have been selected by the trustees of the Mackie Academy for their proposed new academy at Stonehaven.

The Marquis of Huntly has been appointed to preside at the next annual Sanitary Congress.

In consequence of the heavy pressure of orders received by the Climax Ventilating Company, of 15 Great George Street, Westminster, S.W., it has been necessary to greatly increase the size of the works; a large number of fresh hands have been employed, and it will now be possible to carry out all contracts with great promptitude. The company have just received instructions for the ventilation of the works and offices of the E.C. Powder Company, near Southfleet, Kent; for the church of St. Mary, Cotherstone; and several other churches and public buildings.

The Architect.

THE WEEK.

On Monday next Mr. Anderson will begin his first course as Professor of Anatomy in the Royal Academy. The demonstrations will commence on November 2. The chemistry lectures of Professor A. H. Church will this year treat of grounds, oils, vehicles and varnishes, pigments, new or little-known pigments, selected and restricted palettes, conservation of pictures and drawings. The first will be delivered on November 23. The course of Mr. J. E. Hodgson, R.A., will begin in January next, and will be devoted to the technique of ancient and modern painters. Mr. Aitchison's course on Saracenic and Turkish architecture will follow. At present the lectures on sculpture remain undetermined.

Through the resignation of Mr. George Wallis, F.S.A., Keeper of the Art Collections in the South Kensington Museum, the services of one of the oldest officials will be lost to the Science and Art Department. He has been senior keeper in the Museum for nearly twenty-eight years, and is therefore entitled to rest on that account alone. In addition, Mr. Wallis has served as art master and in other ways for a further period, and in all can count over forty years of work as an official. In 1841 he was appointed to the School of Design in Somerset House, from thence he passed to the Spitalfields School, and afterwards to the Manchester School. Mr. Wallis aided in the preliminary work of the Exhibition of 1851, and served as superintendent of the British textile division. Afterwards he became head-master of the Birmingham School. He was associated with the Exhibitions of 1862 and 1867. Mr. Wallis prepared several reports, which have been printed. If he wrote an autobiography it would contain much that would be useful hereafter, for Mr. Wallis was not one of the officials who hampered progress in the art schools and elsewhere.

The architects of Sunderland are dissatisfied with the arrangements of the competition for the proposed lunatic asylum. It is intended to limit the competition to architects who have already designed buildings of the class, and as the local architects do not possess the requisite experience, the arrangement is simply a device for excluding them. Fortunately in England there is no great demand for lunatic asylums, and consequently very few architects have been enabled to carry out that class of work. The Sunderland Council, by restricting the competition to them, cannot expect more than a repetition of something that already exists, and it would be almost as wise to send a surveyor to make plans of an asylum which could be carried out by a builder. An open competition would not entail more expense than one between a select few, and there can be no doubt the result would be more advantageous to Sunderland.

Efforts are being made for the recovery of an old Scottish chalice. It appears that early in the present century two old chalices, dated 1638 and 1642, passed into the possession of the late Lord Panmure. For some years great efforts by antiquaries and others have been made to trace the destination of these chalices. The 1642 chalice, bearing the Dundee town-mark, has been discovered in the possession of the rector of Exeter College, Oxford, a drawing of which appears in "Old Scottish Communion Plate." It is with reference to the 1638 chalice that an appeal is made on behalf of several influential antiquaries. A few years ago this chalice was exhibited at a *soirée* in connection with the Society of Antiquaries by Messrs. Lambert & Co., Coventry Street, W. Since then it is supposed to have been sold for some charity. The Messrs. Lambert "regret they are unable to afford the information" which would lead to its discovery. A well known English antiquary, who saw the chalice at the *soirée*, and took a wax impression of its hall-mark, states that it was stamped with the Edinburgh hall-mark, and had engraved on its bowl an inscription to the effect that it was gifted to Monifieth in 1638 by a nobleman, whose name he is unable to recall. It had a large saucer-shaped bowl set on a slender stalk, and weighed, according to a statement in the church records, "16 ounces and one drop." As this chalice forms an important link in the history of the manufacture of Scottish chalices, any information which would lead to its present destination would be of great service to antiquarian research.

The Liverpool City Council on Wednesday authorised the Library Committee to apply the sum of 800*l.*, portion of the profits of the Autumn Exhibition, in the purchase of pictures and works of art for the permanent collection. The committee propose to purchase a bronze statuette, *Peace*, by Mr. Onslow Ford, and the following pictures:—*A Select Committee*, by H. S. Marks, R.A.; *An Idyll*, by M. Greiffenhagen; and *Ronda Fair*, by Mr. A. Melville. Some objection was raised to the expenditure of 800*l.* on the statuette, which was described by one member as having an ungraceful pose, legs of unequal length and a peculiarly ugly face. But the force of criticism has been weakened of late in the Council, and the proposal was carried by twenty-seven votes to seven.

The tunnelling beneath the Mersey for the conduit of the Liverpool Waterworks is a most difficult operation; but as the delay in completing it has retarded the delivery of the water in the city, there is some dissatisfaction. The death of one of the contractors has naturally caused many people to become desponding about the result. Mr. Deacon, the engineer, in his last report admits this, for he says:—"I have reason to believe that the disappointments which have occurred in connection with this tunnel have led to the impression in some minds that its completion is practically impossible. I have consistently urged the contrary, and the experience gained in the progress of the work has increased the confidence I have always felt that it will be satisfactorily carried out." In order to inspire confidence in the operations, Sir Benjamin Baker has been asked to give his opinion on them, and to say whether there is a prospect of their being successfully carried through within a reasonable time, and whether it is advisable for the Corporation to complete the tunnel according to the present plans, or whether any other plans, or a modification of the present ones, had better be adopted. In his report Sir Benjamin Baker states that he approves of the plan adopted by Mr. Deacon, and does not consider many deviations from the course hitherto pursued are necessary.

The volume on "Bungalows and Country Residences," by Mr. R. A. Briggs, published by Mr. Batsford, contains such an ample list of subscribers, it does not need any commendation of ours to insure its success. We may say, however, that these drawings of executed works will be found suggestive by many architects and by people who are thinking about building comfortable and economical houses, but are not determined upon the character of what they desire. By a bungalow, Mr. Briggs does not mean a house for a special locality like those near Margate, to which the title was first applied in England. His definition of a bungalow is "a little country-house, a homely, cosy, little place, with verandahs and balconies, and the plan so arranged as to insure complete comfort with a feeling of rusticity and ease," and the aim of the author is "to show that small houses costing about 700*l.* can be built simply, economically and, I hope it will be thought, artistically." A few of the houses are more costly: one is 2,500*l.*, another 2,200*l.*, and a house for New Zealand was estimated at 4,500*l.* There is a surprising amount of variety in the plates. Mr. Briggs is never afraid to exercise his imagination, and to think for himself. But it must be said he never attempts anything which is out of place in buildings of the class he has in view. Even the bungalow, "in a free Greek style," does not appear inapposite, for the treatment does not recall the small Classic houses of the early part of the century, which seemed to be derived from an ancient mausoleum. The designs are also satisfactory, through the lightness which pervades them, and they all are adapted to make bright and cheerful homes, at prices which compete with commonplace houses of the speculative builder.

LANDOR ON ART.

IT is often said that the art of writing noble prose is lost in England, and some will maintain that the last master was Walter Savage Landor. There are others of a more hopeful turn who hold that if not the last of the race he was at least the finest prose writer of the century—a man who could combine, as Archdeacon Hare says, "the dignity and almost the soaring flight of Milton's prose with the ease and elegance and classicalness of Middleton, and the precision, plain spokenness and downright good English of Swift." Yet while admitting his eminence in literature, it may be doubted whether Landor was not meant by Nature for a different pursuit. The freaks which cost him so much were signs that he was not at ease in a quiet study. He was of a militant disposition, and seemed to take delight in attacking men and things with his pen because a different sort of weapon was not allowed to him. Landor was, no doubt, unjustly treated when a Duke of Beaufort declined to recommend him for the Commission of the Peace, and he found that in other affairs his independence became an obstacle to his utility as a citizen. He was baulked in his ambition, and there was nothing left but to impose exile upon himself and to expend his vigour on literature. He laboured as much in the hope of finding an anodyne in the expression of his thoughts as with the desire to gratify what is called the reading public. He described his efforts when he said, "Never have I done anything to attract the public notice, which is ordinarily attracted not by the slow operation of silent power, but by a rapid and incessant display of peculiarities and freaks in the most public paths of literature."

A man cannot continuously spin ideas, like Wolsey, "spiderlike, out of his self-drawing web." He must turn his attention outwards. Italy, in Landor's time, did not afford much which it was agreeable to contemplate, with the exception of art that was not modern, and accordingly there is much in his writings which denotes that he had overcome many of his insular prejudices about buildings and the pictures and statues which may serve to adorn them. He also became a collector, and the following note of Emerson's gives a pleasing glimpse of Landor as a man of taste about 1833:—

> On the 15th May I dined with Mr. Landor. I found him noble and courteous, living in a cloud of pictures at his Villa Gherardesca, a fine house commanding a beautiful landscape. I had inferred from his books, or magnified from some anecdotes, an impression of Achillean wrath, an untamable petulance. I do not know whether the imputation were just or not, but certainly on this May day his courtesy veiled that haughty mind, and he was the most patient and gentle of hosts. In art he loves the Greeks, and in sculpture them only. He prefers the *Venus* to everything else, and after that *The Head of Alexander*, in the gallery here. He prefers John of Bologna to Michel Angelo; in painting, Raphael; and shares the growing taste for Perugino and the early masters. One room was full of pictures, which he likes to show, especially one piece, standing before which he said "he would give fifty guineas to the man who would swear it was a Domenichino."

In the "Cardinal-Legate Albano and the Picture-Dealers" we have some of Landor's experiences of what had to be gone through for the acquisition of masterpieces in Italy, and of the tricks of which Englishmen especially were the victims. The Italian prelate's observations are marked by much biting sarcasm against our countrymen's connoisseurship, for Landor could rarely forget his grievances when he held a pen. Thus in one place he remarks:—"As the English fight best upon the ocean, it is probable and presumable that they see best with their heads under water, which opinion some of the pictures bought by them on dry land at enormous prices for their National Gallery seem to confirm." In another place it is said:—"If the scourers at Florence go on as they have been going on lately, the collections at the Gallery and at Pitti will be fit only for the Committee of Taste in London." And again:—"There is scarcely an auction, I hear, in England, without a dozen of Domenichinos, while in Italy dukes and princes lie on their deathbeds and gasp for one." Mingled with much that is no less bitter are fragments in which Landor expressed admiration for genius in the most apt words. Here is a sample of many passages which are supposed to be spoken by the Legate:—

> Titian ennobled men; Correggio raised children into angels; Raphael performed the more arduous work of restoring to woman her pristine purity. Perugino was worthy of leading him by the hand. I am not surprised that Rubens is the prime favourite of tulip-fanciers; but give me the clear warm mornings of Correggio, which his large-eyed angels, just in puberty, so enjoy. Give me the glowing afternoons of Titian, his majestic men, his gorgeous women, and (with a prayer to protect my virtue) his Bacchantes. Yet, signors, we may descant on grace and majesty as we will; believe me, there is neither majesty so calm, concentrated, sublime and self-possessed (true attributes of the divine), nor is there grace at one time so human, at another time so superhuman, as in Raphael. He leads us into heaven, but neither in satin robes nor with ruddy faces. He excludes the glare of the light from the sanctuary; but there is an ever-burning lamp, an ever-ascending hymn, and the purified eyes see, as distinctly as is lawful, the divinity of the place. I delight in Titian, I love Correggio, I wonder at the vastness of Michel Angelo; I admire, love, wonder and then fall down before Raphael. Even the colouring of Correggio, so transparent, so pure, so well considered and arranged, is perhaps too rich and luscious for the divine ideas of Raphael; it might have overshot the scope which his temperate suavity attained. Raphael in Rome had forgotten the tenderness of his diviner love, and the tempter had seduced him to change purity for power. Nevertheless he remains, far beyond all comparison, the greatest genius that ever glorified the arts. He was not, like Michel Angelo, a great architect, a scientific sculptor, an admirable poet; he attempted not universality, but he reached perfection. What other mortal has?

In his "Pericles and Aspasia" Landor could easily have displayed his acquaintance with art, but there as elsewhere in his writings he shows his appreciation of measure, and he never becomes pedantic. As the letters are supposed to be mainly written by Aspasia, no more is said than was likely to come before the mind of a lady whose topics were numerous, and who as a Greek would fear to do or say anything that was out of place. But Landor introduces many ingenious speculations in the course of the correspondence. For instance, he suggests, and he was the first to do so, that the shield of Achilles which Homer describes was derived from some Assyrian work, a theory which of late years has gained credit for other men. Pericles is also made to give expression to remarks which are not unworthy of that enlightened citizen-ruler. Here is an imaginary letter apropos of the completion of the Parthenon, which those who have read it the most often will be glad to see again reprinted:—

> The Hecatompedon, which many of the citizens begin to call the Parthenon, is now completed, and waits but for the goddess. A small temple, raised by Cimon in honour of Theseus, is the model. This, until lately, was the only beautiful edifice in the Athenian dominions. Pericles is resolved that Athens shall not only be the mistress, but the admiration of the world, and that her architecture shall, if possible, keep pace with her military and intellectual renown. Our countrymen [Aspasia was an Ionian], who have hitherto been better architects than the people of Attica, think it indecorous and degrading that Ionians, as the Athenians are, should follow the fashions of the Dorians, so inferior a race of mortals. Many grand designs were offered by Ictinos to the approbation and choice of the public. Those which he calls Ionian are the gracefuller. Crateros, a young architect, perhaps to ridicule the finery and extravagance of the Corinthians, exposed to view a gorgeous design of slender columns and top-heavy capitals, such as, if ever carried into execution, would be incapable of resisting the humidity of the sea-breezes, or even the action of the open air, uninfluenced by them. These, however, would not be misplaced as indoor ornaments, particularly in bronze or ivory; and, indeed, small pillars of such a character would be suitable enough to highly-ornamented apartments. I have conversed on the subject with Ictinos, who remarked to me that what we call the Doric column is, in fact, Egyptian, modified to the position and the worship; and that our noblest specimens are but reduced and petty imitations of those ancient and indestructible supporters to the temples of Thebes, of Memphis, and of Tentyra. He smiled at the ridicule cast on the Corinthians by the name designating those floral capitals, but agreed with me that on a smaller scale, in gold or silver, they would serve admirably for the receptacles of wax-lights on solemn festivals. He praised the designs of our Ionian architects, and acknowledged that their pillars alone deserve the appellation of Grecian; but added that in places liable to earthquakes, inundations, or accumulations of sand, the solider column was in its proper situation. The architraves of the Parthenon are chiselled by the scholars of Phidias, who sometimes gave a portion of the design. It is also reported that two of the figures bear the marks of the master's own hand; he leaves it to the conjecture of future ages which they are.

It is hardly necessary to say that, in writing such a passage, literary form rather than technical exactness would be foremost before Landor. There is much else in the "Pericles and Aspasia" which would bear transcription if space were available. But a more elaborate example of his method of treating an architectural subject demands attention. This is the conversation between Landor and his landlord, the Marchese Pallavicini, in which more than one style is noticed. It should be mentioned, however, that

the talk about architecture appears to be intended to give more effect to a subject of a very different sort—an act of barbarity by an English general, and which drew from Landor the famous words, "These two fingers have more power, Marchese, than the Houses of Parliament. A pen! he shall live for it. What with their animadversions can they do like this?"

Pall. I have been in London, and was much surprised at the defects of architecture in your capital. Not only Rome, Genoa, Venice, Verona, Vicenza, Milan, but Paris itself, excels it; and how incomparably more magnificent must have been the public works of Athens!

Lan. Those both of Paris and of London would not constitute a third of the Piræus alone, of which the length exceeded six miles; the height was sixty feet, not reckoning the foundation, and the breadth at top about twelve. It was of square stones, fastened together by cramps of iron and by molten lead.

Pall. Being begun and carried on in the greatest haste, I wonder how the Athenians had leisure for the squaring of stones, each of which weighed several tons.

Lan. This question has never been discussed. In my opinion, those of the greatest bulk were taken from the ancient walls of the city, which not only were useless now its boundaries were quadrupled in extent, but which obstructed the communications and deformed the beauty of the place. These originally were erected by one of those societies of itinerant masons, which, like many colonies, are called Pelasgian. I suspect they were Etrurians—a people more early on the road to civilisation than the inhabitants of Hellas, although they never carried it to the same extent. They, indeed, were the Chinese of Europe.

Pall. Surely you undervalue them.

Lan. Far from it. I was speaking of the ancient: Greece alone, of all the nations on the globe, rivals the modern. But there is no evidence or probability that the arts in old Etruria ever equalled the same in China; where, moreover, the powers of imagination and reflection raise our wonder in their earlier writers. The great wall of China quite obscures the Piræus by its magnitude, unequalled as it is in its utility and beauty, which may be imagined, although faintly, if we recollect that to the main walls of the Piræus were added two others—one four miles long, the other somewhat shorter, each adorned with statues.

Pall. This work, then, exceeded any the Romans themselves have built.

Lan. The Romans did less in their city than in the conquered territories. The greatest of their labours was the wall against the Caledonians; the most solid and majestic was the bridge across the Danube. In theatres they excelled the Athenians; those at Athens were worthy of Pallas and Seneca; those at Rome, of Æschylus and Sophocles. The Romans, in ancient times as in modern, found plenty of materials among the ruins. A band of robbers and outcasts saw on the banks of the Tiber a city so little dilapidated that it served them to inhabit. They repaired the roofs with sedge and rushes, deposited their plunder within the two fortresses dedicated to Saturn and to Janus, grew thrifty and religious with no abatement of enterprise or stint of spoliation, found order more and more necessary, and consented to elect with more regularity and ceremony their captains and arbitrators. . . . No spacious and commodious mansion, no august temple was erected in five hundred years—so uncouth was the genius of the people. The magnificence of Syracuse and of Corinth, the most elegant and splendid cities in Europe, left little impression on the destroyers. Their cups were (as they termed it) of barbaric gold, while their temples and the gods within them were of clay. Captured Veii soon supplied Rome with a large assortment of richer images. Lucullus was the first of the nation who had any idea of amplitude in architecture. . . . Augustus did somewhat in adorning the city, but Augustus was no Pericles. Nero never lost sight of magnificence, and erected a palace before which even the splendours of Pericles fade away. Plutarch, in the "Life of Publicola," tells us that he himself had seen at Athens the columns of Pentelican marble for the temple of the Capitoline Jupiter; that their thickness was reduced at Rome, to the injury of the proportions; after which he informs us that the gilding of the whole edifice cost 12,000 talents. Now, the hall in the palace of Nero was as large as this temple; the ground on which it stood was thirtyfold the extent, and the gilding so general that it was called the Golden House. At the decease of Nero the masters of the world trembled to enter it; removed from it the works of Phidias and Praxiteles, of Scopas and Lysippus, of Zeuxis and Apelles, of which probably all that were extant were assembled here; poured forth the lava of the precious metal from its ceilings, its architraves and its arches, and constructed out of its kitchens and stables a bath and amphitheatre for the whole Roman people.

Pall. Nero seems to have pacified them surprisingly, after burning down their houses.

Lan. The conflagration I believe to have arisen from the necessity of purifying the city after an endemical disease, and of leaving no narrow streets in the centre for its recurrence. The extreme love which the populace bore toward Nero long after his death is a proof that they did not attribute to him cruelty or caprice; and they were abundantly recompensed by his liberality. Nothing was left for the Flavian dynasty but to demolish and reconstruct; nothing for Trajan but to register on marble his rapid victories, leaving his virtues to be inscribed on materials more perishable; nothing for Hadrian but to imitate the finer works of the Athenians' architecture then sank for ages.

Landor very often made it a rule to point the moral of his conversations by applying what was said by the speakers to some defect of his countrymen. The discussion of Roman greatness seems to be no more than a prelude to an attack on the English architecture of that day. Although Landor was as enthusiastic a lover of ancient literature as was to be found in England, he was as indisposed as any University Professor of Greek to suffer an abatement of his comfort out of reverence for antiquity. The following suggests one side of Landor's character:—

Pall. With St. Paul's and St. Stephen's before you, cottages are built like castles, and palaces like cottages; and where the edifice is plain and simple the window is a hole knocked in the wall, looking like an eye without an eyebrow or eyelashes, or else it is situated in the midst of an arch, as if a ruin had been patched up to receive it.

Lan. This idea we borrowed from Florence, and very lately. The Florentines turned their shops into palaces when they turned the name of silk merchants into that of marquis, and the patchwork is equally visible in the house and in the master.

Pall. Since I was in England I understand that absurdities even more ludicrous are come into fashion, and that your architects fall back again on what they denominate the Elizabethan style. In fact, condemned by nature to perennial twilight, you wainscot your apartments with the darkest oak, and empanel it in your ceilings; your windows are divided and traversed by thick stonework, and the panes of glass, extremely small, are sometimes made darker by green and purple, and are held together by almost an equal quantity of lead.

Lan. True enough; and when we attempt to be more Classical we run into as gross absurdities. Some of us would be Grecian in our houses, forgetting that the Greeks made a wide difference between the construction of a house and of a temple. Even if they had not, still the climates of the two countries are so different, that what would be convenient on the shores of the Ægean Sea would be ill-placed on the shores of the British Channel. Exposed to our biting winds, the Corinthian acanthus would soon shed its beautiful foliage. And what, indeed, have we to do with the ram's skull and horns belonging to the Ionian?—we, who slay no rams for sacrifice, and to whom, therefore, such a decoration is without a memorial and without a meaning. But Ionian pilasters are admissible to the fronts of our houses, and Ionian columns to our public edifices. However, the ornaments of the capitals should be taken from what is indigenous and appropriate. The portals in England are despicably poor; whereas to these is greatly owing the dignity of the exterior, and the dignity of the interior to the staircase. In this, likewise, the best houses of London, with very few exceptions, are deficient.

Pall. We Genoese are proud of our doorways.

Lan. They are magnificent; so are many in Rome and some in Milan. We have none in London and few in the country, where however the staircases are better. These are usually oak. I inherit an old ruinous house containing one, up which the tenant rode his horse to stable him.

After reading such judgments as the foregoing, which are not marked by any misgiving of infallibility, one is sometimes tempted to believe that Harold Skimpole was not far out when he described Squire Boythorn, that is Walter Landor, as "an amiable bull who is determined to make every colour scarlet." The red rags that Landor tossed about in his fury were numberless, but at least they enabled him to display his agility and power.

THE RIVER, FROM THE CUSTOM HOUSE TO RICHMOND; OR, A CHAT ABOUT SOME BRIDGES.

[By a Correspondent.]

THOUGH, since the rise of the great profession of civil engineers, the building of bridges, except on the smallest scale, has passed out of the hands of the architect, yet the members of that noble calling are undoubtedly better judges, from an artistic point of view, of the design of modern bridges than those gentlemen in whose offices all the drawings were prepared. The writer proposes in the following remarks to put down the result of his own observations, made on the spot, leaving out of the question such criticisms as may be found on the older bridges in some of our standard architectural books.

In this country the writer is not aware of any example on a large scale of Mediæval bridges like that at Prague and many other places on the Continent, though there still remain a few specimens of ancient bridges with chapels or oratories attached to them. The fact is that it has never been so necessary in England to have them, owing to our rivers not being of the great width and length of many in Europe. The difficulties of getting across the streams have not been great, and neither the Thames nor the Severn, therefore, boasts of any noteworthy specimen of a bridge built in the Middle Ages. Great Britain is but a small

island, and in her mountains, rivers, lakes, bays, &c., she cannot pretend to rival Europe. As in her natural features, so it is with the scale of her cathedrals and churches, though this is much more evident abroad in the matter of height than in other respects.

There is a charm about the Mediæval bridges of England that no modern examples possess. For there is in them an absence of straining after architectural effect. They are very simple, made fit to do their work, and look all the better for this. What does a bridge want with extraneous or overlaid ornamentation when it has to bear the brunt of swollen streams and floods, or the assaults of broken ice? Take such an example as the well-known bridge at Llangollen, with its cutwater piers. Though, owing to the exigencies of traffic, it had not long since to be widened, the ancient "elevation" still remains. In perspective effect, any bridge that is increased in width loses, owing to the piers and arches being thicker and the proportions thus altered. This has always been the great objection to a plan often advocated, through want of thought, in respect to Rennie's great work, London Bridge.

The Tower Bridge will be more after the style of the continental examples, with its noble towers, which will clothe eventually the ungainly skeleton of ironwork to be seen at the present time as one steams down the river. The writer was at first disposed to say, "What a sham!" remembering the published views of this great bridge as it is to be. But it is more charitable to believe that the huge "bascules," or central opening parts of the bridge, must have to do with this ponderous mass of ironwork within these eventually beautiful towers, as well as to provide lifts to convey foot-passengers up to the high-level "crossing" when the carriage-traffic underneath is interrupted.

To dilate upon the confessedly successful design of London Bridge would be to waste the time of the readers of *The Architect*, for have not its praises been sounded far and wide for many a day? Let us, therefore, hurry on elsewhere. Those who live in London, within convenient distance of the great river Thames, ought to be thankful for the privilege of watching its ebbing and flowing tide, ceaselessly alive, with the uninterrupted current of air coming up from the open sea right through the main part of the huge city. People pass hurriedly backwards and forwards over the bridges on their various errands, and, unless they cast their eyes to the nearest adjoining bridge, do not notice the design, all being under them. Those who pass beneath the bridges by the steamboats do so quickly also, because they cannot help it, and do not observe the bridges owing to the other distractions. In a bridge of simple design, where the piers do not abound in lines parallel or continuous with the curve of the bridge, one does not notice the absence of a right angle between the vertical and other lines. For example, in the case of London Bridge and elsewhere, each of the rustications to the piers is very slightly wedge-shaped, in order to get over what might otherwise offend the eye. But in the new bridge at Battersea, as will be commented upon later, the effect, owing to a different treatment, is by no means satisfactory.

Southwark Bridge belongs to the comparatively new era of such structures, where cast-iron began to play a conspicuous part, and plain as it is, with seemingly little design, it is really much more effective than recent "ornamental" examples. The spandrils of the iron arches are open, with reticulations or latticework, the dividing line between the upper and lower reticulations being curved. The piers are quite plain, and the junction between these grey granite abutments and the iron portions of the bridge is a little abrupt here, as in other examples. It is difficult, indeed, to see how this can be avoided. The rise of the bridge in the centre is just sufficient to be graceful. In the new bridge of the London, Chatham and Dover Railway, next to Southwark Bridge as one proceeds up the Thames, there appears to be a mild reflex of the latter, but of course without the gentle arched outline on the top; the piers are unobtrusive, and the open latticework in the spandrils very well treated to suit the material employed. Probably few think of looking at the under side of the iron bridges, as this can only be done from a steamboat or other craft. It is in those where iron plays an important constructional part that the soffite, with its series of arched ribs, braces and stiffening latticework between, has a picturesque effect, as the perspective varies while the steamer moves on. In all the granite bridges the soffite of the arches is an unbroken line. It would no doubt be quite practicable to have ribs to vary the monotony, and thus form a kind of panelling, such as is often employed in chancel and tower arches to churches of the later Perpendicular period. But this would to some extent be *appliqué*, whereas the iron construction just commented upon is not so.

The writer has missed out the South-Eastern Railway Bridge at Cannon Street, as it is really difficult to regard either this or the older Chatham and Dover Bridge at Blackfriars, or the Charing Cross Bridge, as having any architectural pretensions, properly so called. The harsh contrast between the long horizontal lines of the permanent way and the vertical lines of the piers in the first-named example is not pleasing, and the series of unnecessarily heavy cantilevers under the parapet is cumbrous.

The older railway bridge at Blackfriars is so utterly crushed out by its sister bridge on the down-stream side on the one hand and the road bridge on the other, that it escapes much criticism now, though the writer well remembers when he could *see* it. The spandrils are pierced, but instead of the latticework being lozenge-shaped, as in most of the other Thames bridges, it is oblong, the height of the panels being greater than the breadth thereof. It is little use raking up old sores; but can one fancy anywhere else than in this "free country" how the railway interest could thus utterly ignore the effect produced on the "silent highway" and its surroundings by this massing-up of encumbrances to the flow of the river, as well as to the good appearance of the Thames? Even when looked at from the west side, the long line of the railway bridge close behind is unsightly.

At the time the new bridge at Blackfriars was built it met with a great deal of adverse criticism, as will be recollected. Here, as in the other structures where the iron arch plays a part, the junction between it and the granite seems abrupt. The spandrils with latticework, having circular bosses at the intersections, do not really look as well as the simpler latticework in the Grosvenor Railway Bridge higher up the river, by far the best in the writer's opinion, because it is not fussy and overdone. In the same way bosses in slighter relief occur in the arches of iron at intersections. What a parade is made of the great piers at the Blackfriars example, projecting so considerably beyond the bridge in order to provide resting-places for travellers! The huge scale of the capitals and bases to the piers of necessity takes off the real size of the abutments, and, considering these capitals are *appliqué* to some extent, and do not absolutely support the superstructure of the bridge, the only work they do is to carry the light perforated balustrade. What a flourish of trumpets about the sculpture that was to adorn this bridge, which is still "conspicuous by its absence!"

The graceful, pleasing outline of Waterloo Bridge is welcome as a rest to the eyes after the series of modernisms passed since London Bridge was left behind, though Southwark Bridge should be excepted from this category. The rise in the centre is just sufficient, æsthetically, and almost imperceptible. The two columns to each pier, set a little distance apart and in due scale, are much more effective than the huge and would-be ornamental ones at Blackfriars Bridge. It is, too, a great advantage to be able to see both these structures from one point of view—*i.e.* nothing being between them. What an immense difference, though Mrs. Malaprop has remarked that "comparisons are odorous!" In the case of Waterloo Bridge, the contrast between the generally open balustrades and the plain solid parapet over the piers is very happy. No more need be said about this well-known feature except to remark that the introduction of iron has been disastrous in an artistic way for bridge-building, except those on the suspension principle, where one would imagine, from the very nature of the thing, it was impossible to build anything ugly. Alas! alas! Recent history proves the contrary, as will be touched upon later. The old Hungerford Bridge, an early example of the suspension construction, was really a pleasing object, and equally so in its changed quarters over the rocky gorge of the Avon, instead of its lower level over the Thames. About the structure which has taken its place one cannot say much. It does its work, which is

something, but to those who, like the writer, are old enough to remember its predecessor, "the old ways are the best." The fact is, the whole neighbourhood between the river and Charing Cross has been damaged, as regards picturesqueness, by first the removal of Hungerford Bridge, and then by the destruction of the quaint Northumberland House. The street of palaces in the Avenue here by no means compensates the lover of the old things for what has been lost.

And now to Westminster Bridge, the elegant structure of which so much was made at the time it was built. The primary fault in this design is undoubtedly its being based on stone construction instead of iron. There is here likewise that sharp, unsatisfactory-looking line of demarcation between the granite piers and the ironwork which has been remarked upon before.

(*To be continued.*)

THE PRE-RAPHAELITE SCHOOL.

AT the private view of the pre-Raphaelite exhibition in Birmingham on Friday, the 2nd inst., Mr. William Morris delivered an address in the long room of the Art Gallery in reference to the rise and purpose of the school of painters of which the exhibition about to be opened was illustrative.

Mr. Morris said that he proposed to speak mainly on the school of painters who were called "The pre-Raphaelite Brotherhood." There was all the more reason for his doing so because their principal doctrines and tenets had been successful—had impressed themselves upon the present generation of English people, and he thought to a certain extent also on the artists of France. The pre-Raphaelites were a very small body of men. The three leading names were those of Dante Gabriel Rossetti, Everett Millais and Holman Hunt, and to these were added various others, some of whom belonged to the school, although he did not think they were enrolled in the brotherhood. The most noteworthy of the painters of those who were not thus enrolled was Ford Madox Brown. They were not only few, but young. They had to make themselves all the reputation they attained to, and they began with what might be really characterised as a very audacious attempt. Their attempt was a definite revolt against the academical art which, in the main, brooded over all the schools of civilised Europe; and this revolt might be considered as a phase of that great general revolt against academicism in literature as well as in the arts. In literature the revolt had taken place very much earlier. There were many reasons for that priority of time, of which the principal seemed to him to be that the art of painting, being so much more technical than literature, depended much more upon tradition than ever literature did; and that tradition, however poor it might be, however much it might have fallen from its high estate, had very great power to keep people from changing. In literature, therefore, a revolt was sooner made, and its effects were plainer to be seen. It was about the year 1848 that the general first appearance of the pre-Raphaelites was made before the public. The special and particular doctrine they inculcated was that of naturalism. That doctrine at first sight seemed to contain a self-evident proposition. But it meant a great deal when laid down as against the rather worn-out tradition which dominated the whole of the artistic schools of Europe. He remembered distinctly that as a boy, when he had pictures offered to him, he could not understand what they were about. He said to himself, "I suppose that has got the sort of thing in it which ought to be in a picture. There is nothing to be said against it, no doubt"; but plainly he took little interest in it, and he supposed that that was the case with nine hundred and ninety-nine of every thousand of people who had not received definite technical instruction in the art of painting. Even up to the present day the greater number of what he should call laymen in these matters did not feel any very great exaltation when they first saw an old master. The pre-Raphaelites, on the other hand, were perfectly naturalistic, and one would have thought that the public would receive their attempts with acclamation—would say, "Well, here at least is something we can understand. Here are visible sheep, such as we see every day." Strange to say, the public did exactly the reverse. They said, "Why, these things are not like nature." They did not mean that; they meant to say, "They are not like pictures"—which they were not, as pictures then were.

There was, however, one man at least who, although he had been brought up in what might be called—not in contempt, but for the sake of definition—the old-fashioned drawing-master school, and although his master was Mr. J. D. Harding, looked at these pre-Raphaelite paintings with open eyes. That man was John Ruskin, and he became immediately their champion before the public. No doubt they needed such a champion very badly. However, they made way, and finally won great personal reputation, and achieved success, he thought, as a school. But it was necessary to know a little more of what was the meaning of the word "naturalism." He could conceive a certain kind of naturalism which could not be very interesting. There was a good deal of talk nowadays about such naturalism as that which amounted to very little more than a bare statement of fact by means of the art of painting. Pictures painted with that end in view were scarcely works of art, but rather something on the border-line between works of art and scientific statements. The pre-Raphaelite pictures were not in the least like that. They aimed at the conscientious presentment of incident. The brotherhood came to the conclusion not only that they should paint well, but that this good painting—the excellent execution, the keen insight, the careful skill—should be an instrument for telling some kind of story to the beholder. No doubt, in the early days of pre-Raphaelitism, it was rather the fashion to decry any sort of convention. That was a reaction from the tyranny of the weak and unworthy convention against which they had raised the standard of rebellion. But every work of art, whether imitative or suggestive, must be founded on some convention or other. The real point was that that convention should not be, so to say, a conventional convention—should be a convention you had found out for yourself, whether by deducing from history or whether by contemplating nature.

But the pre-Raphaelites went even further than the mere presentment of incidents: they conscientiously considered the due and proper incidents that were necessary in order to make a work of art. Perhaps this third side of their doctrines was less considered by the public, was much more difficult to put before the public than the other two sides. Of the original artists of the school Dante Gabriel Rossetti was the one who had this side most before his eyes—the side, namely, of ornament. No picture was thought to be complete unless it had definite, harmonious, regulated, conscious beauty. It ought to be ornamental. It ought to be part of a beautiful whole, in a room or a hall, or what not. He had some hesitation in speaking about their townsman Mr. Burne-Jones, because he was an intimate friend of that last great ally of the school; but the truth must be told that the man who added this absolutely necessary element of perfect ornamentation was Burne-Jones, and that only when he came to the aid of the school did it become fully apparent that pre-Raphaelitism was a continuation of the art that had been current throughout Europe when Raphael began to be put forward as the great master of the Renaissance. Something might now be said of the individual members of the school. He should say that of the pure naturalism of the school, not thinking so much about tale-telling as about the presentment of natural form, Millais was the leading representative. Dante Gabriel Rossetti, Holman Hunt and Ford Madox Brown were all of them equally concerned with the conscientious representation of incident. In looking at their pictures it would be seen that they always tried to knock the nail in very hard, that there was something going on, something being done, in the picture. At their best they were successful in doing what every great artist tried to do, in really convincing the beholder that the event he represented could have happened in no other way than that in which he represented it to have happened. That in point of fact was the thing aimed at in all the art which might be called dramatic art—or perhaps epical art would be the better word. Then, again, as he had said, Rossetti and Burne-Jones were those representatives of the school who had leaned most towards the ornamental side of art. Burne-Jones especially had really brought the ornamental interest of his art about as far as the thing could go. Both Rossetti and Burne-Jones had very little to do with representing the scenes of ordinary modern life as those scenes occurred before our eyes.

One often heard this brought against artists of that school as a shortcoming. It was a shortcoming. But was the shortcoming due to the individual artist or to the public at large? An artist in representing a modern event must do something to qualify or soften the ugliness and sordidness of the surroundings of life in our day. That was the case not only with pictures, but in literature. Mr. Hardy and others, who were supposed to represent modern life in their novels, took care to surround their modern scenes with an atmosphere of out-of-the-way country life. One never met in the country heroes and heroines like those which Mr. Hardy described. In painting, indeed, one could not get quite so far away from the facts as they could in literature. By all means, if anyone really felt moved to treat modern life, let him do so in the best way he possibly could; but he had not the right in the circumstances, considering the evasions he was absolutely bound to make, to blame his brother-artists who felt compelled to turn back to the life of past times, or rather whose imagination must have some garb, and perhaps naturally took the garb of some period at which the surroundings of life were not ugly but beautiful. The principles of the pre-Raphaelite school, so far as they inculcated pure naturalism,

had more or less succeeded. So far as they went towards the representation of incident—on their epical side—they had not succeeded so well, perhaps, because, after all, for the production of works of that kind were required either people of stupendous genius, of whom very few could be born in one epoch, or a great homogeneous school of tradition which was able to use up all the various qualities of the lesser men, and combine them in one harmonious whole.

For a similar reason the side of the school which tended towards ornament had made less impression still upon the age. That could not be wondered at because, after all, what was all the ornamental side of art but a part of architecture, and architecture could not flourish, could not be an art in a satisfactory sense, unless it were the spontaneous expression of the pleasure and will of the whole people. In our present chaotic condition art could not be got out of the combined efforts of the people at large; it must be simply the work and the expression of individual ideas and individual capacity working towards a certain end. That was one reason why these galleries with their pictures were so interesting. But galleries and museums and the like were not of the slightest use to a population that had not some idea of art before it went into the gallery or museum. You cannot educate a man who does not desire to be educated. Surely the desire must exist, if not universally, or even very widely. Yet it did exist in some degree or another, and granted that the desire existed, then all places like that museum, and especially picture galleries—if the pictures were only sufficiently well chosen—might be of the very greatest possible advantage to those people who wanted to put themselves more or less in the ranks with the great artists of past and present times. They must feed the love of art by showing works which were not only acknowledged to be great works, but which they could at once feel to be so. People sometimes talked as though "the man in the street" were the proper person to apply to for a judgment on works of art. But, as a matter of fact, "the man in the street," instead of being unsophisticated, was sophisticated through and through with the rags and dross of the arts that were current. In music the "unsophisticated" person usually took up not the finest works of art, but the ordinary, feeblest, banal tunes which were dinned into his ears at every street corner; and so it was in the plastic arts.

In conclusion, he commended to young artists the leaders of the pre-Raphaelite movement as an example of patience and diligence and courage, and, in fact, of most of the qualities that went to make great men. He warned young artists against stopping at copying the mannerisms of a great master instead of allowing the example of the master to gradually lead them to do something definite for the world on their own account. He invited all to continue to study the great masters of this and of all schools, not from a conventional point of view. He did not say that one should merely admire a picture because it bore some great name, whether one liked it or not, but let each distinctly say whether he liked it or not. If one could not like it, he did not say let him not be ashamed of not being able to like it, but let him acknowledge, to himself at all events, that his education was not quite complete on the matter of the arts, and try to make it so.

TESSERÆ.

Lincoln Cathedral.

NO English cathedral is externally so imposing as that of Lincoln, and nearly the whole of its sublime architecture belongs virtually to the thirteenth century, though in actual date it begins a few years earlier and ends a few years later. It is the custom to speak of Salisbury as the great typical example of the Early English style, and its unity and completeness may warrant the claim; but, both for the grandeur of the whole and the artistic beauty of every part, and also as a complete exponent of English architecture throughout the whole duration of its greatest period, Lincoln far surpasses it. Its leading features form a perfect illustration, and that on the grandest scale, of the entire history of our architecture from the last years of the twelfth to the earlier part of the fourteenth century. The Pointed style commences with the choir, the smaller transept and the chapter-house, all of which seem to have been erected before the year 1200 by Bishop Hugh. It is commonly stated that his architect was a Frenchman from Blois; and M. Lassus broadly states that he reproduced at Lincoln, in 1188, the design of a church commenced at Blois in 1138. The assertion carries with it its own refutation; for, in an age of restless progress, is it likely that they would take the trouble to bring over a foreign architect of so retrograde a taste as to ignore the artistic progress made in his own country during half a century? In fact, the wonder of the work is being so much in advance of its age, and that advance is not in a French but an English direction. The church of St. Nicholas, at Blois, is in the Early Pointed style of the latter half of the twelfth century, but bears not the least resemblance to this—it is of the same character which is usual in French transitional works, and its carving is strictly Byzantine, not a trace of which is to be observed at Lincoln. If then a French architect was engaged here, he must not only have made over the details of his work wholly to Englishmen, but have studiously followed English forms in the general features. The rebuilding of the cathedral seems to have been followed on systematically westward by the two successors of Bishop Hugh, till the completion of the nave by Bishop Grostete, about 1240. The nave is by far the finest portion of the work as then completed, and is probably in the whole the grandest example of the Early Pointed style in this country. It exhibits the Early English style in its highest state of development, massive without heaviness, rich in detail without exuberance, its parts symmetrically proportioned and carefully studied throughout, the foliated carving bold and effective—there seems no deficiency in any way to deteriorate from its merits. The west end is unique, being a vast and almost unperforated wall covered over with range upon range of decorative arcading, flanked by two vast stair turrets, and backed by two noble towers, the completion of which was, however, delayed until a much later period. The beautiful chapels to the right and left on entering from the west, with their light and elegant columns contrasting most agreeably with the massive piers of the nave merit attention; also the noble rose window in the north transept, perhaps the finest in England. The most gorgeous part, however, of the cathedral is its eastern portion. This was added between the years 1256 and 1282, and is consequently a little later than Henry III.'s work at Westminster. It agrees with it in style, but carries out the principle of window tracery on a far grander scale. It is, in fact, the most splendid work of that period which we possess, and, did it not lack internal height, it could be hardly exceeded in beauty by any existing church. The sculpture with which it was once profusely enriched was of a very high order, the foliated carving perfectly exquisite, the mouldings and other details of the most perfect character. The east window is probably the finest in the kingdom, as is the east front in general, after allowing a certain abatement for the error of having false gables to the aisles. The student of Mediæval art ought to make a long sojourn at Lincoln, and study its treasury of art at his leisure.

The Kilsby Tunnel.

The Kilsby Tunnel, on the London and North-Western Railway, is about 2,423 yards long, and was intended at first to be formed 18 inches thick in the brickwork; but it was found necessary to increase this, in most cases, to 27 inches. The whole has been built in either Roman or metallic cement. The works were commenced in June 1835; but such serious difficulties were met with, at an early stage of the proceedings, that the contract was given up in March 1836, and nearly the whole work had to be performed by the company. Previous to the commencement of the works trial shafts were sunk in several parts of the line of the tunnel, in order that the nature of the ground through which it would have to pass might be ascertained, and it was found to be generally lias shale, with a few beds of rock—in some places dry, in others containing a considerable quantity of water. In sinking the second working-shaft it was found that a bed of sand and gravel, containing a great quantity of water, lay over part of the tunnel, and this was such a perfect quicksand that it was impossible to sink through it in the ordinary way. By repeated borings, in various directions near this part of the tunnel, the sand was discovered to be very extensive and to be in shape like a flat-bottomed basin, cropping out on one side of the hill. The trial shafts had accidentally been sunk on each side of this basin, so that it had entirely escaped notice until the sinking of the working shaft. Mr. Stephenson, the engineer, was led to suppose that the water might be pumped out, and that under the water thus drained the tunnel might be formed with comparative facility; this proved to be the case. Engines for pumping were erected, and shafts sunk a little distance out of the line of the tunnel. The pumping was continued nearly nine months before the sand was sufficiently dry to admit of tunnelling, and during a considerable portion of that time the water pumped out was 2,000 gallons per minute. The quicksand extended over about 450 yards of the length of the tunnel, and its bottom dipped to about 6 feet below the arch. In May 1836, one of the large ventilating shafts was commenced, and completed in about twelve months. This shaft is 60 feet in diameter and 132 feet deep, the walls are perpendicular and 3 feet thick throughout, the bricks being laid in Roman cement. The second ventilating shaft is not so deep by 30 feet. These immense shafts were all built from the top downwards, by excavating for small portions of the wall at a time, from 6 to 12 feet in length and 10 feet deep. In November 1836, a large quantity of water burst suddenly into the tunnel, in a part where there were no pumps; it rose very rapidly, and in order to prevent the ground being loosened by it at the far end, where it was excavated, a rather novel mode of building the brickwork was resorted to.

This was by forming a large raft, and on this the men and their materials were floated into the tunnel, and with considerable difficulty and danger performed their task. All the difficulties were at last conquered, and the tunnel finished in October 1838; but, of course, the expenses were increased to a very great extent. The directors felt it to be their duty not to restrict the proper outlay of capital, when satisfied it would secure the convenience of the public, the stability of the works and the efficient management of the traffic; and they felt persuaded that a perseverance in this course, to the completion of the undertaking, would be found most economical in the end and best calculated to insure the permanency of that successful result which is now happily placed beyond the reach of doubt. The contract for making the Kilsby Tunnel was 99,000*l.*, and it has cost more than 300,000*l.*, or upwards of 130*l.* per yard. There were 30,000,000 bricks used in it, which, at ten hours for a working day, if a man counted fifty in a minute, would take 1,000 days to get through them all. There were above 1,000,000 bricks employed in the deepest ventilating shaft, and its weight is 4,034 tons. The weight of the whole tunnel is 118,620 tons, or it would freight 400 ordinary merchant ships of about 300 tons each, and if these bricks were laid end to end they would reach 4,260 miles. The quantity of soil taken from the tunnel was 177,452 cubic yards.

Metals used in Ancient Sculpture.

A statue of Venus is spoken of as composed of adamant, and attracting a mass of iron. Aurichalcum, or orichalcum, was an alloy of copper and gold, esteemed for its brilliancy and hardness. To prevent bronze from changing, and to give it a good colour, it was rubbed with the amurca of olive, or with bitumen. The ancients, who executed an immense quantity of statues and works in bronze, made a great variety in their alloys. The brass, bronze or copper most celebrated were those of Cyprus (Kupros), from which is derived the name of copper; of Corinth, the alloy of which is attributed to chance, to the melting and mixture of several metals during the burning of that city; but it appears that this is hardly possible, and that the bronze is more ancient. In the time of Pliny it was imitated with an alloy of copper, gold and silver; that of Delos and of Egina was much esteemed, as well as that of Tartessus in Betica. Polycletes preferred the bronze of Delos, and Myro that of Egina. The different kinds of copper, of Cordova or of Marius, of Sallust, found in the Alps, and of Livy, mined in Gaul, were much sought after, and derived their names from the proprietors of the mines who worked them in the time of Cæsar. There was also a black bronze, and also that which, being of a liver colour, was called hepatizon, from hepar, a liver. It was believed for a long while that the ancients dipped bronze in water to harden the arms which were made of it; but M. d'Arcet has proved that tempering softens bronze, and that it is only by alloying copper with tin in certain proportions, and by forging it, that it acquires hardness and elasticity, and becomes sonorous. Electrum, which is mentioned in Homer, was either natural or artificial. It was made by mixing a fifth of silver with four-fifths of gold. This alloy was much esteemed, because it was found to shine more with lights than either gold or silver. Pliny says that vases made of it assumed the colour of the iris or rainbow. The name of electrum was also given to yellow amber. Several statues of iron are mentioned, both wrought and cast. The statue of Mammurius, who made the ancillæ or sacred bucklers in the time of Numa, was of lead. Obrizum was the purest gold, which, after having passed several times through the fire, acquired a brighter colour. Some statues were made of massive gold, but in general they were embossed (called sphurelaton) from a thin plate. Gold was thus used in statues where it was joined to ivory; and often statues in metal or wood were only plated or gilt. Gold of several colours was used, and sometimes also painted ornaments or precious stones were used in conjunction with it. Silver is frequently mentioned by authors as a material for statues; it is, however, less adapted for sculpture, and was less used than gold, of which several preparations were known. Tin is enumerated by Homer among the metals in the shield of Achilles; but it is more than doubtful whether this description and others relating to the arts were written by the great poet.

Timber Roofs.

In 1561 Philip De Lorme published a method of constructing roofs and domes with timbers, or rather short planks. One of these roofs covered the stables of the Tuileries, and after remaining sound and secure for 234 years was demolished to make way for some improvements in the palace. The arches were formed of two planks, 9 inches in width, cut into convenient lengths for the required form. This seldom exceeded 4 feet, and were applied to each other in thicknesses to form the rib, and so laid that the ends of one set came in the middle of the others. Mortises were then made in them, through which were longitudinal ties, and these had a small wooden pin passed through them on each side of the circular ribs to keep them in their upright position and to prevent them twisting. In some of the buildings executed by this architect, when the span of the roof exceeded 60 or 70 feet, two ribs were used so put together that they partook of the character of hollow voussoirs and were very strong. Another instance of the success of De Lorme's construction was the original dome of the Hall au Blé at Paris, 120 feet diameter, built by Legrand and Molino. This roof was destroyed by fire. Some objection has been made to this mode of construction on account of the labour required in cutting the number of mortises, making the longitudinal ties and introducing the pins. Therefore in some instances the mortises have been omitted, the planks bolted and spiked together, and the ties nailed to the upper and lower edges, the latter as ceiling joists or boarding. Nevertheless there exists in these roofs considerable waste of material and great labour as compared with some other roofs of similar spans. Colony Emy, a French engineer, proposed in 1817 an improvement on De Lorme's system by using the planks in the reverse position, in fact being precisely the laminated arch of the present day. On first sight it may appear that De Lorme's plan is the strongest, as the depth of the planks is greater than their width, from their being placed edgeways. In the other system thin boards are bent upon templets to the proper curve, and kept from separating by iron straps and bolts, as also by radiating struts, which are in pairs, notched out so as to clip the rib between them. The joints are much fewer, and the fibre of the wood coinciding with the curvature of the rib gives it considerable elasticity, so as to slightly yield rather than break under any violent strain. Colonel Ardent, who found some difficulty in obtaining in many parts of France fir planking at reasonable prices, and where squared oak timber was in abundance, designed some roofs for riding schools in which considerable lateral stiffness is obtained by a deep cross-strutted ridge, while in Colonel Emy's roofs a series of longitudinal timbers at back of arch are inserted for the same purpose. Other roofs of far greater span have been constructed by Colonel Emy, who after many experiments suggested the employment of a double curved rib having different radii. These held in at the springing were in the spandrel braced by timbers ranged like St. Andrew's crosses; iron bolts or timber binding-pieces pinned at the sides hold the masses together.

Responsibility for Plans.

The architect is responsible for supplying the contractor with proper details and instructions for the works at proper and due times during the progress of the works, and is liable to the building owner if the contractor is delayed or is compelled to stop work in consequence of absence of details or instructions. But it seems that no breach of this duty is committed unless the builder applies for the plans. Consequently little or no damage could result to the employer from the architect's default if the plans were not asked for. But where the omission to supply plans has led to delay in completion, possibly the owner might sue the architect for loss of profits which would have arisen from the timely completion. If the architect gives incompetent and useless directions, or does not give proper instructions as and when required, he renders himself liable to his employer. As between builder and employer, the contract usually gives the architect power to give instructions binding on the builder. When the contract provides that the builder shall act under the architect's instructions, in case of want of clearness of drawings, the architect, when asked, must give directions, and if the builder does the work without them the builder will be liable. In large engineering works the engineer frequently prepares plans and specifications not only of the work to be constructed, but also indicating the method of dealing with the subject matter of the contract, as if, for instance, he specified the scaffolding of a house. But whether he does so or not, it is clear that no warranty on which the contractor can rely can be implied, that no work can be executed according to the plans and specifications, whether by the engineer or by the building owner. But if the building owner suffers any loss from the negligence of his architect in preparing the plans and specification the architect is liable to the employer for such damages as he may have suffered in consequence, but not for damages which the employer has paid, but which he was not legally compellable to pay on the ground that there was no warranty, nor it would seem for loss which he has incurred by not insisting upon a contract which a builder had foolishly bound himself to perform.

New Olympic.—"A Royal Divorce" has become a success at the People's Theatre of London, and packed houses nightly, and at the matinées every Monday and Wednesday, attest the popularity of Mr. W. G. Wills's romantic drama, and Mr. W. W. Kelly's wisdom in giving a poetic play, magnificently staged, at the popular prices of 1*s.* pit and 6*d.* gallery. Miss Grace Hawthorne, as the Empress Josephine, commands the sympathy of the crowded houses, and has increased her reputation as a painstaking and gifted artist.

NOTES AND COMMENTS.

In May the London School Board advised the Legal Committee that, before commencing any legal proceedings against Mr. Robson, who was formerly architect to the Board, the three opinions already given by Sir Henry James and Mr. R. S. Wright against bringing an action against Mr. Robson, with the evidence taken in the case of the Kilburn Lane School, and any other papers which the solicitor may consider necessary, should be submitted to counsel, and further legal advice obtained by the Board. The Legal Committee now announce that they have taken the opinion of the Attorney-General and Mr. Henry Sutton, and in consequence they do not propose that any further action be taken in the matter. We suppose this puts an end to the discussions about Mr. Robson's lapses, and the ratepayers will have to make the best of the extra taxation which was caused by defects in the Kilburn Lane and many other schools.

The Birmingham Corporation have acted with their usual energy in dealing with the scheme for conveying water from Wales, and will be able to satisfy any Parliamentary committee that the subject has been properly investigated. A survey has been made by Mr. Mansergh which has enabled him to supply an approximate estimate of the cost of the undertaking. At first it is proposed to carry out the tunnels, cut and cover works, three reservoirs, and two lines of pipes, which will enable a daily supply of 23,000,000 gallons to be furnished. The cost of the works will be about 3,340,700*l.* If the scheme is carried out in its entirety with five reservoirs, the cost will be 5,654,953*l.* A second and independent estimate has been prepared by Mr. Gray, and he considers the sum of 3,340,700*l.* is adequate. The Parliamentary plans and reference books are being prepared, and will be lodged on the last day of next month. As there may be a contest in the committee-rooms the services of Sir Frederick Bramwell, Messrs. Hawkesley, and other eminent engineers and experts have been secured to support the Bill, and these gentlemen have already had an opportunity of going over the line of conduit and visiting the site of the principal works. If the Bill becomes law the works will be commenced as soon as possible, in order that they may be completed in 1900.

It ought to be a rule that architects, when they become members of a public body, should abandon their business during the time they hold office. Acts of theirs which may arise from mere forgetfulness, if they appear in any way to be connected with business are sure to be misinterpreted, and injury is done to others who are not ambitious to hold public office. A case of the kind is now giving rise to a good deal of talk in Bognor. Every visitor to the town is aware that the houses that face the sea are rather irregularly disposed, and it would be well if it were feasible to pull down and rebuild the whole line of sea-front. One of the owners of Marine Parade has had his house altered, under the direction of an architect who is a member of the Local Board. The work does not give satisfaction to the owner of the adjoining house, for he has informed the Board that serious injury has arisen to his property, firstly, by the bringing out of the bay window on the ground floor in excess of what it formerly was, about two feet beyond the line of projection of his windows and the whole range of the buildings, and the carrying of such the whole way up the house, whereas formerly it was a flat front from that point; secondly, by the formation of a covered terrace and a verandah at a much higher level than formerly to the higher windows, thereby obstructing the prospect from his drawing-room windows, which he had been in the enjoyment of for twenty-two years, and at the same time destroying the privacy of his rooms, as well as depriving him of a certain amount of light, and, correspondingly, air. The applicant said he could not believe such an injury had been knowingly permitted by the Board, as he believed it to be their invariable rule not to permit projections without the concurrence, first obtained, of the adjacent owners, and that was never sought of him or granted. He enclosed a letter from his surveyor, giving his testimony on the subject, and, in conclusion, asked the Board to require the immediate setting back of the said bay window and the obnoxious verandah, the latter of which was twice the width and longer than the previous one, while the bay window would be found to exceed the projection given and shown in the block plan deposited with the Board. The architect for the work maintained that it was impossible to show the projection on a small scale plan, but the Clerk replied that the adjoining houses were also omitted, otherwise the Board could have observed the extent of the projection. The architect then stood on his rights, and said the Board had approved of the plan, and he proposed that a letter should be sent to the complainant stating how the Board could see no reason to alter the approval given in January. The architect was advised by one of his brother-members not to press the matter to a division, and the Clerk said, as legal adviser, he was prepared to say that the consent of the Board to the building as altered was not given. Eventually discretion prevailed, and the consideration of the subject was postponed until a committee of the Board had inspected the building. There seems to be no doubt that in this case information was not furnished, for which not only the draughtsman of the plan, but the committee who passed it, should be held responsible.

During the session of the Birmingham and Midland Institute, which begins on Monday, the 19th inst., some of the lectures will relate to art. Mr. J. E. Hodgson, R.A., has taken "The Fathers of British Art" for a subject. Mr. W. Martin Conway, late of the Liverpool College, will treat of "The Early Stages of the Development of Art in the Ancient World." The fascinating theme of "Leonardo da Vinci" has inspired Mr. Walter Pater; if nothing new can be revealed, the lecture will at least express the old facts in an attractive way. Dr. Waldstein will again discourse about "The Newly-discovered Tomb of Aristotle." Lovers of music will, no doubt, find interest in Mr. Ambrusters's lecture on "The Wagner Festival Performances at Bayreuth." There will also be one by Mr. F. Niecks on "Jean Jacques Rousseau as a Musician," for among the first revolutionary efforts of the author of the "Contrat Social" was an attempt to popularise notation by the aid of numerals. He also copied music, and compiled a little dictionary of terms. Professor Silvanus Thompson is to lecture on "Complementary Colours." There will be other lectures on social, literary and scientific subjects.

The mystery that surrounds the origin of diphtheria is not to be cleared by the lectures by Dr. Thorne Thorne, assistant medical officer to the Local Government Board. But it is quite certain from his investigations that the disease is not the outcome of defective building. Among Dr. Thorne Thorne's conclusions is the following:—"That the steady increase in the diphtheria mortality has coincided, in point of time, with steady improvement in regard of such sanitary circumstances as water supply, sewerage and drainage." According to Dr. Thorne Thorne the disease is owing to a micro-organism, and there is nothing to show that the *bacillus diphtheriæ* originates within a building. At the same time, it is recommended, as among the means of preventing diphtheria, that such residences should be selected as will secure dryness and general wholesomeness of site and surroundings, together with ample exposure to sunlight and free movement of air.

The Hastings Poor-law Guardians have agreed to pay 650*l.* to the architect who prepared plans for a new workhouse, and claims over 5,000*l.* for his work. The sum will be paid without prejudice, and can only be taken as an instalment. The Guardians have again taken up the subject of building. It was agreed to apply to the Local Government Board for authority to reconstruct the existing house in an inexpensive manner, to use the infirmary as part of the workhouse, and to buy land for the erection of a new infirmary. It is to be hoped the Local Government Board will not sanction the scheme. Inexpensive rebuilding is a delusion, for the Guardians should by this time understand that substantial work alone is economical. The utilisation of the infirmary is also fraught with danger to the poor. But after the experience of the past, we daresay the ratepayers are not surprised at any proposal of the Guardians.



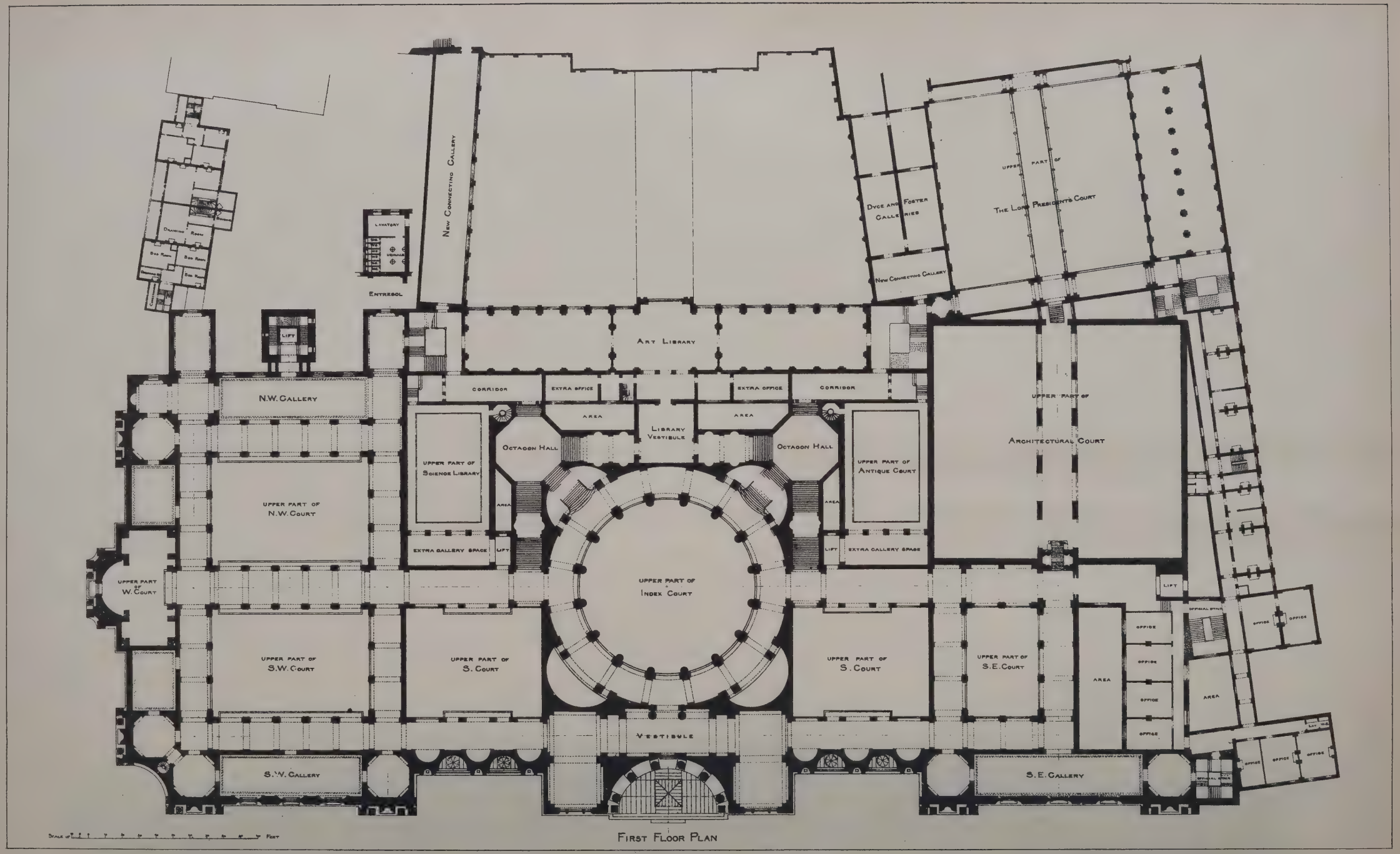


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Design for the Completion of the South Kensington Museum.—(Motto: "English Tradition.")

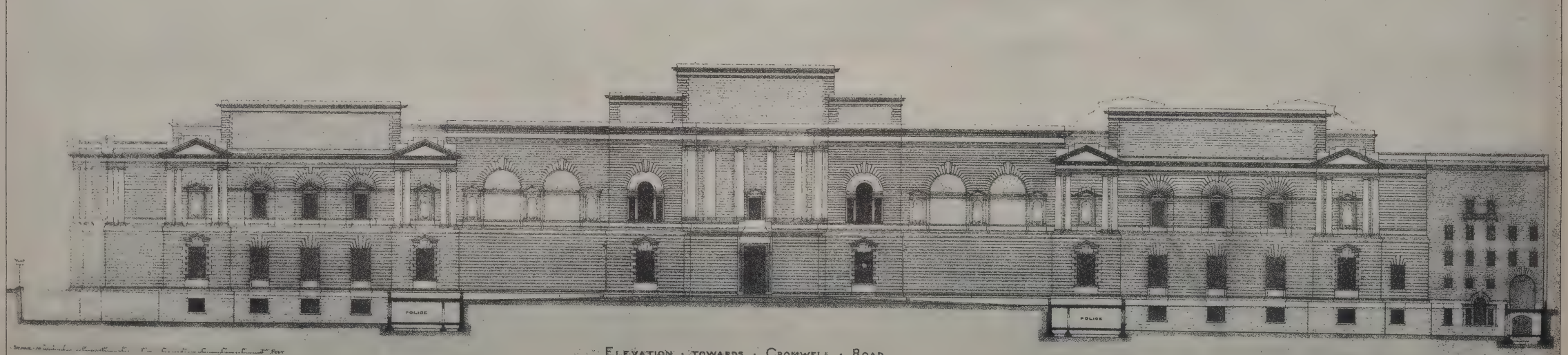
Mervyn Macartney, B.A., Architect.

The Architectural Illustration Society. Second Series. Plate No. 418.

The Architect, Oct. 9th 1891.



ELEVATION · TOWARDS · EXHIBITION · ROAD



ELEVATION · TOWARDS · CROMWELL · ROAD

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DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM.—(Motto: "English Tradition.")

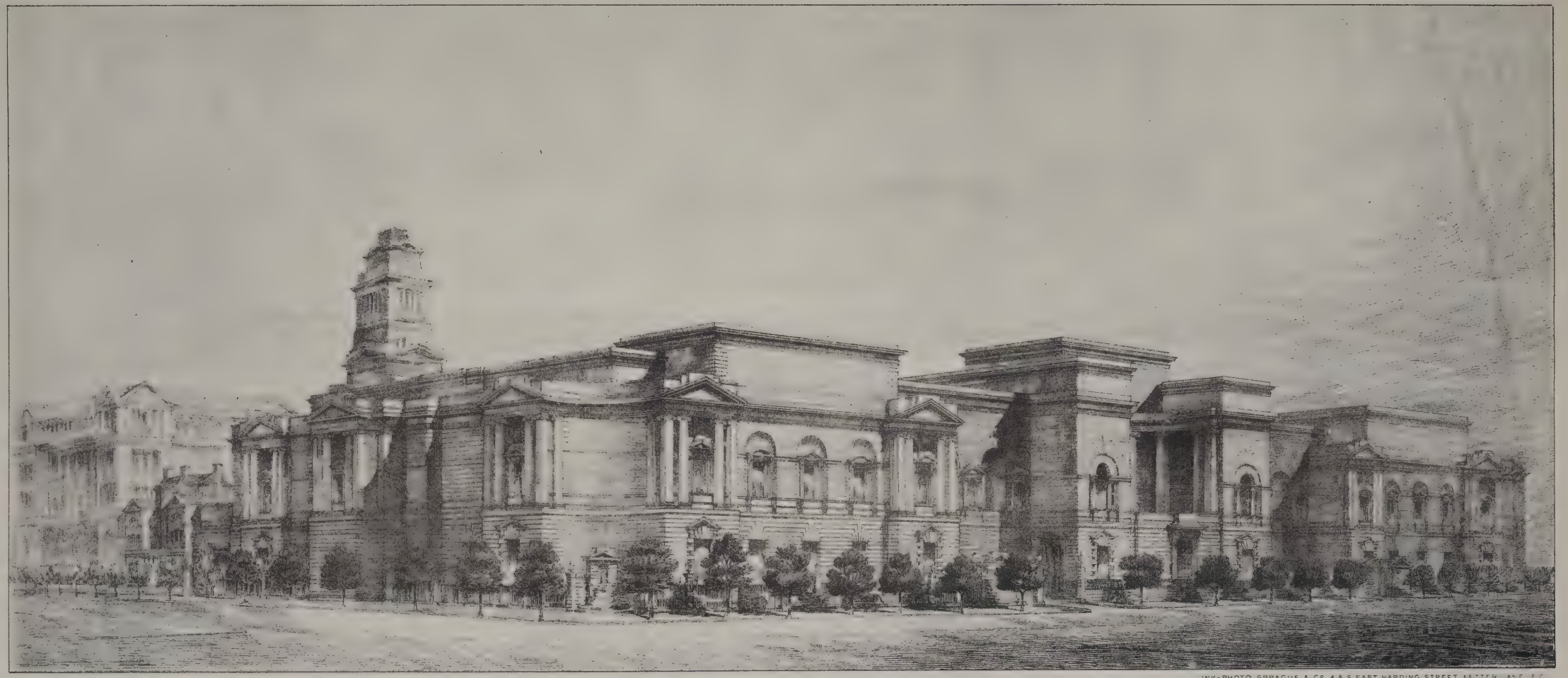
MERVYN MACARTNEY, B.A., Architect.

The Architect, Oct. 9th 1891.

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New Editorial Offices of "The Lady's Pictorial."

CRAIG-Y-NOS CASTLE. RESIDENCE OF MADAME PATTI. NICOLINI

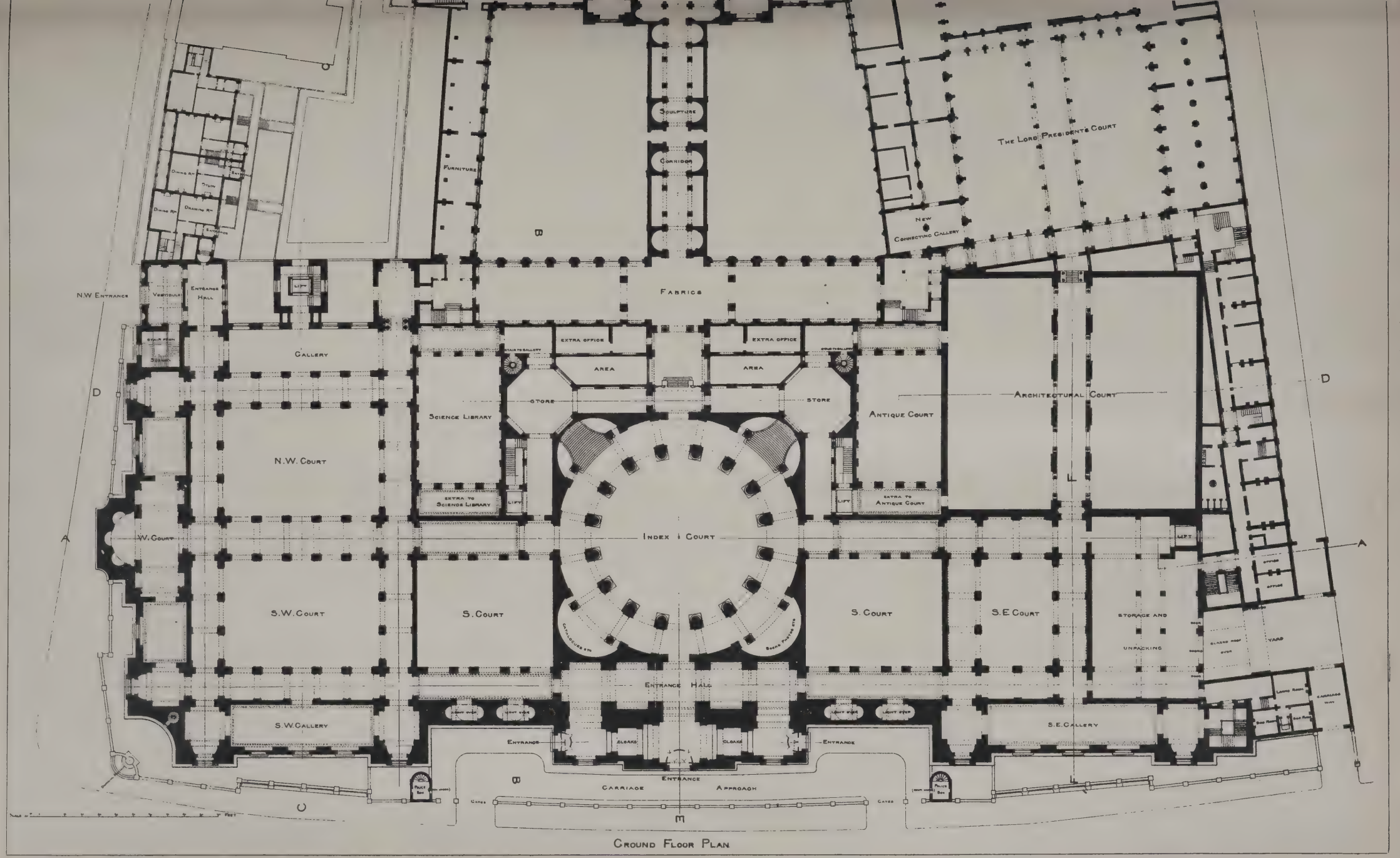


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DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM.—(Motto: "English Tradition..")

PERSPECTIVE VIEW.

MERVYN MACARTNEY, B.A., Architect.



Ground Floor Plan

PHOTO-LITHO SPRAGUE & Co 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

Design for the Completion of the South Kensington Museum.—(Motto: "English Tradition.")

MERVYN MACARTNEY, B.A., Architect.

Architectural Illustration Society: Second Series. Plate N° 419

The Architect, Oct. 9th 1891.

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NOS. 416–419.—DESIGN FOR COMPLETION OF SOUTH KENSINGTON MUSEUM. [M. MACARTNEY.]

EDITORIAL OFFICE, "LADY'S PICTORIAL."

IT is not often the private office of the editor of a London newspaper is made the subject of an illustration. There is, however, no necessity for concealment, for Carlyle's joke about a sight of such a place being like to the "Satan's Invisible World Unveiled" was not warranted by facts. It will be seen that this editor's room is arranged and furnished with the good taste that would be expected. There are also many things which are remarkable for utility and ingenuity.

The cabinet in antique style, which forms a principal feature of the room, was produced by Messrs. Howard & Son, of Berners Street, whose reputation for that class of work is almost universal. The electric lighting has been successfully accomplished by Messrs. Laing, Wharton & Down. In one corner is a registered screen desk invented by Messrs. Godfrey, Giles & Co., which, when closed up, resembles a cabinet bookcase, and when let down discloses a nest of fittings, and forms an excellent writing-cabinet. The invention combines in one article a small cheval screen, a writing-desk and a small bookcase on one side, and at the back the lower part is fitted with a rack for music. At the top of the shelf there is fitted a piece of brocade, in which can be placed photographs, cards, &c. At the opposite end of the room is one of Messrs. Godfrey, Giles & Co.'s patent Cosy Corners, carried out in a style that corresponds with the rest of the fittings. At the end corner there is a wrought-iron standard, fitted with the electric light, and at the other with a small revolving tray, suitable for a book or a coffee-tray, or an ash-tray, &c. The editor's writing-table is also one of Messrs. Godfrey, Giles & Co.'s specialties. At the owner's will it can be made either into two separate tables, of Chippendale design, 4 feet square, or for large meetings or luncheon-parties, &c., it can be made into a table, 10 feet or 12 feet by 4 feet, the whole being perfectly solid and sound. The decorations, fitments, &c., have been also most successfully carried out by Messrs. Godfrey, Giles & Co. The editor's chair was specially made by Messrs. Hewetson, Milner & Thexton. The curtains were by Messrs. William Wallace & Co., and the lamp-shades by Messrs. Williams & Bach. The illustration is taken from a photograph by Messrs. Bedford, Lemere & Co.

CRAIG-Y-NOS THEATRE.

CONSIDERABLE interest was aroused in the Swansea district by what may be termed the inauguration of Madame Patti-Nicolini's theatre at Craig-y-Nos Castle. The theatre is situated to the right of the castle, and adjoining the French billiard-room and clock-tower, the façade not being situate in the general front of the buildings, but facing the interior grounds. The theatre is comparatively plain outside, but the façade is sufficiently distinctive to mark the purpose of the building, and on the pediment stands in gold letters the name of the building, "Patti Theatre." There is no grand entrance from the exterior, the theatre being chiefly for guests, and the principal entrance is from the castle itself. A wide corridor leads from the French billiard-room and passes along the side of the theatre, long windows to the right giving views of the open country. The doors of the theatre are to the left on this corridor, which gives access both to the floor and the stage of the theatre.

The chief features of the theatre are, perhaps, its lighting and its peculiarly arranged floor. The lighting combines all the most recent inventions for electrical effects and changes. The electroliers are gracefully arranged throughout the building in a variety of charming forms. The central electrolier in the ceiling has sixteen lights, and, in addition, brackets of three lights each are employed round the building. On the stage the lighting is perfect, and the instantaneous changes of hue which can be produced by switches throw the limelight effects of local theatres greatly into the background. The floor has been arranged with a view to utilising the theatre as a ballroom when desirable. For this purpose the floor, which slants away towards the stage end, for the purpose of giving a good view, can be raised without any difficulty to a perfect level with the stage. A ballroom 62 feet long can thus be provided at any moment, and the fact of cosy drawing-room effects being obtainable at the stage end certainly does not diminish the pleasures of the ballroom. Upon entering the house the visitor is struck by the beauty of detail shown everywhere in this miniature opera-house. Before him rises the act-drop, which is a picture of the prima-donna in the character of Semiramide driving a chariot and pair of horses. The beautiful cove ceiling has been decorated within the past few months, and presents a very attractive appearance, whilst all round the auditorium rise Corinthian columns with decorated surfaces, dividing the walls into panels. Behind the auditorium the building is curved, and a small gallery or tribune, which can accommodate a few extra visitors, is here provided.

The building is seated for 180 persons, though it is possible to find room for 200. The chairs in the first few rows have arms, and are covered with blue silk plush. The decorations are in quiet tints of blue and ivory white, with a plentiful use of gilding. The orchestra is divided from the auditorium by a low balustrade, and is sunk 6 feet below the stage level; it has room for a band of sixteen. The proscenium is striking; it is 20 feet wide and 19 feet high. Surrounding it is a handsome border, with a pediment and descriptive and decorative ornaments at the top. The frieze of the proscenium is panelled, and this panelling is continued round the auditorium, bearing the names of great composers. Rossini, Madame Patti's favourite composer, occupies the central position on the proscenium, and is faced by Shakespeare above the gallery. The tableau curtains are extremely handsome; they are richly festooned, and are of electric blue silk plush. The stage is 24 feet deep and 40 feet wide, with ample height to allow the whole of the scenes to be raised into the flies without rolling. Every modern appliance necessary for opera and pantomime has been provided. There are electric footlights, rows of batten lights in the wings, and ground lights with coloured lamps for giving coloured effects. The number of lights in the entire theatre is 281, and all these are under the control of the prompter by means of a handsome switchboard which has each department labelled. A cellar under the stage accommodates the machinery for working the scenes and traps, while alongside the auditorium, on the opposite side of the corridor, is a large scene-dock, 32 feet long and of full height, to accommodate scenes when not in use. Behind the stage are five dressing-rooms on the first and second floors, with a loft over for properties. The architects were Messrs. Bucknall & Jennings, of Swansea and London; the builder was Mr. H. Smith, of Kidderminster; the scenery was painted by Mr. W. Hann, of London; and the decorations done by Messrs. Jackson & Sons, of London. The electric lighting has been carried out by the Wenham Light Company.

NEW DEPARTURES IN ARCHITECTURE.*

By Professor T. Roger Smith.

THE subject that I have chosen for this evening—"New Departures in Architecture"—can be illustrated in more than one way, and, indeed, I propose to touch upon more than one side of it. As perhaps some of you may have anticipated, new departures in architectural education suggested the idea, and these, at any rate, so far as they affect this college, will not fail to receive notice before I close. But the actual history of buildings and of those nations who have successfully practised building is wonderfully full of new departures, and it appeared to me that it would be more interesting and more instructive if we gave a few minutes' attention to some of the important new departures of which we can trace the effects in art, instead of spending one whole hour in the consideration of classes, examinations and the other machinery of learning. I am going, therefore, to ask you to glance at that part of the history of architecture in Europe which is best known to us, simply with the object of noticing how, from time to time, a new departure has been taken, and of seeing what an impulse has been given to activity thereby.

In the western world nothing seems a stronger motive-power than the desire for change—for something new; and nowhere is this better illustrated than in European architecture. We might perhaps extend this remark beyond the limits of the western world, but Oriental people seem to be less bitten with the constant search for the new in art. It comes to them sometimes, and when they are stirred up by changes imbued or forced upon them they, like ourselves, seem to receive a great impetus from a fresh departure; but they can go on for long periods doing very much the same thing without degenerating and with one notable exception, European examples will suffice for this evening. We shall see, if in the short time we have to spend together I can succeed in sketching a few typical instances, that the periods of activity in European architecture have also been the periods of change. Its periods of depression and stagnation have also been periods of monotony.

The story of European architecture should properly begin with that of Greece, but we must pass on, almost without pausing to consider that noble art; and yet the history of Greek architecture at its best is that of a period of swift and rapid development, culminating in a too brief time of the most remarkable refinement and completeness. But many of the new

* Opening lecture to students in Architecture and Construction, at University College, London, on October 5, 1891.

departures are not quite obvious ones, nor are they easily illustrated without a reference to a good many minute points, and we will, therefore, start from the fully-matured Greek architecture of the time of Pericles, without going further back, to consider out of what artistic materials it had been evolved.

Here we have a style of architecture severe, dignified, refined, using only square-headed openings, and depending chiefly upon the column, and an entablature carried by it for its architectural effects. The construction was extremely solid, most minutely exact; accurate setting-out, such as has hardly ever been attempted elsewhere, was the rule. Most of the important buildings were of moderate size, erected in marble, enriched by the finest sculpture, and the refined perfection of their design and execution was their chief means of rousing the admiration of those who saw them. The ornaments were most graceful and exquisite, but not lavish; great pains were expended to produce even minute improvements, and a simple but impressive dignity was the character aimed at.

The decline of the Greek Republics—the period of the successes of Alexander the Great and the diminution of the political and martial energy of Greece—coincides with a time of comparative decadence in Greek architecture. The remains that have come to us from that time are not very impressive, or in fact very extensive. Much that was built has perished; but we have enough to show that in the many parts of Europe and even Asia to which Greek architecture had more or less extended, it was very much less forcible, powerful and complete than it had been in Athens and Corinth or even in Asia Minor at the best time. Indeed, the world, so far as architecture was concerned, was very ready for a new departure. In time, as you all know, the new departure occurred, and so energetic was it as to occasion perhaps the most complete change, and to give perhaps the most powerful impulse that architecture ever was affected by. I allude, of course, to the establishment of Imperial Rome, to the vast structures raised by the Roman power, first in the capital and then in all the great cities of the Empire, and to the novelties in construction as well as in design which we find to characterise the Roman buildings.

The change from Greek to Roman illustrates the truth that novelty, though always associated with activity, is not necessarily a guide to excellence. If you set out on a downward road yours is still a new departure. There are bad novelties as well as good ones. Roman art was inferior to Greek, and alas! it is no rare phenomenon to find that the human mind, sated with that which is excellent, takes a new departure, not in pursuit of that which is better, but only of that which is different; so that, if the search for novelty has sometimes led to vast developments, it has at other times ushered in a decadence, and even precipitated a decline. To some extent it was so in the case of the Roman developments of architecture.

The Roman nature was forcible, overbearing, fond of vastness, of magnificence, of the parade of power, and impatient of refinement. When, after having overcome every other civilised or semi-civilised people, the Romans turned to the embellishment of their city as one means of glorifying their own greatness, what they desired to do was to indulge in display. They had, so to speak, elbowed themselves to the front, and now they desired to enjoy the place they had won, and to make a free use of the boundless stolen wealth at their disposal. Such energy, such resources, have never in the history of the world been lavished upon building before or since, and Augustus, who boasted that he found Rome of brick and left her of marble, was the first to display this ostentatious passion. What was wanted was quickly to erect vast piles, and to adorn them lavishly; and the Roman architect developed two hitherto little-used constructive methods, and made them his chief auxiliaries. These methods, capable of doing so much, and not quite unknown before the Roman day, had not been pressed into the service of architecture, or at any rate of such European architecture as has left remains which have come down to our day. These methods were the use of the arch and the use of concrete. The possession of these means of rapid and ambitious construction enabled the Roman architect to perform surprising feats. His new departure starts from the arch and concrete, and was favoured by the command of material resources and wealth, of slave-labour, of marbles, metals, painting, sculpture, in unlimited profusion; and, in short, of the spoils of the whole civilised world, and was stimulated by the energy of the most energetic race known to history.

If you wish to know how vast and how novel were the structures raised in the few centuries of Roman empire, read the lectures delivered in recent years at the Royal Academy by Professor Aitchison. Nowhere has the picture of the profusion, the variety and the splendour of Roman Imperial architecture been better described or more fully illustrated. The fact that any remains are still left in Rome after centuries of active destruction and plunder and a thousand years of neglect and occasional demolition is an astonishing tribute to the energy with which the Romans built and to the vast mass of building work which they constructed.

Let us for a moment inquire how this new departure operated and what there was about two such simple and (to us) familiar things as concrete and arches, which contributed to so grandiose a result as was actually attained. First, then, consider the change involved in the general adoption of the arch. In the buildings of the Greeks, Egyptians and Persians the openings had been spanned by lintols, that is to say, horizontal beams of wood or blocks of stone or marble, and as in all buildings pretending to a monumental character wood, as a material liable to be burnt and to decay, was not admissible, stone lintols formed the heads of doorways and windows and spanned the distance from one column to another. The consequence of this was that no opening could be wider and no columns further apart than the length of such a stone lintol as could be trusted to go from column to column. Hence the scale of every part was restricted. With the arch the size of openings was almost unlimited, and by means of it the distance apart of columns was enormously increased. But this was not all. The arch led to the vault, and this gave the means of covering large interiors with a permanent roof. The Egyptian interiors had been, it is true, permanently roofed in stone, but at the expense of filling the space so roofed with a forest of massive columns. The Assyrian, Persian and Greek interiors appear, from all that can be inferred, to have been roofed in timber, and, consequently, to have been open to the destruction that has actually overtaken every one of them. The Roman, however, making use of that continuous arch, which we call a vault, and of that admirable arched construction on a circular base which we know as the dome, was able to cover in his most vast interiors with a roof almost indestructible. His command of the arch also enabled him to support these vaults on a few massive piers, and thus grew up a series of grandiose structures which were of vast and noble forms, and which he ornamented with lavish decorations.

The use of concrete—that is to say, of a masonry made of small materials a little coarser than our concrete—enabled the Roman to construct both the vaults and the vast piers which supported them rapidly and comparatively cheaply, while it led him to substitute a superadded surface of stone or even plaster for the solid masonry of the finest Greek buildings. You can easily see how these modes of construction constituted a new departure, and, though they led to results to which we cannot give unreserved admiration, as the buildings were often deficient in refinement and grace, they undoubtedly were associated with a stupendous display of energy. The Imperial palaces, the thermæ, the endless porticos and colonnades, the forums, the aqueducts, and the mansions of Rome formed a vast and sumptuous series of buildings.

The next new departure in architecture was more due to a combination of moral forces than to structural ones.

It was not, however, in structure only that the Roman introduced change. His methods of decorative treatment, and in some cases his methods of dispensing with almost all that was decorative and relying upon the outlines, and the mass of his structure and the disposition of the openings in its walls, for architectural effect were new. He made the Greek orders coarser and in every way less elegant, and he reduced them in many cases to the position of subordinate ornaments, but he used them with a lavishness and connected arches with them with a boldness that were astonishing, and opened a new chapter in the history of architectural design.

When the strength of the Roman departure had fully spent itself a new force arose, and in Rome itself, but more emphatically in Constantinople, led to a notable new departure. I allude to the architecture that sprang up after the recognition of Christianity under Constantine, and his removal of the seat of empire from Rome to Constantinople. At and around Rome the influence of the religious motive power is to be seen at work in the establishment of that form of the architecture generally known by the name Romanesque. At Byzantium—starting with the new name Constantinople—combined religious and political forces resulted in the more original and very vigorous style which we know as Byzantine. Not unnaturally, the more pronounced the novelty the more brilliant was the result.

Both Byzantine and Romanesque grew out of Roman art, but each is widely divergent from the stem out of which it sprang. At Byzantium many of the conditions of a new departure on a great scale were combined, for, in addition to a new religion, there was a new seat of empire, a new mixture of races. Byzantium was largely a Greek city, and the combination of Roman energy with Greek skill and taste seems to stand out clearly in the architecture. Some of the early steps in the development of Byzantine art are lost to us, but the culminating point of what must have been a rapid course remains. In a surprisingly short time a building of great construction and great artistic merit, and original in almost every respect, was reached. I refer to St. Sofia. Here the methods of the Roman architect were all known and followed. The new style displays an almost exclusive employment of the flat dome, usually lighted at the base, and carried on the domical corbels known as pendentives. The square plan, and the quality of the

carving, mosaics and other enrichments are distinctive. It is easy to recognise that Roman architecture was the starting-point, but we find that an entirely new character has been acquired by the buildings, and that an original and a most admirable style had sprung up. I hope that it may yet prove that remains enough exist to show many more of the steps of this metamorphosis than have yet been traced; but whether that be so or not, St. Sofia presents one of the most brilliant examples known of the result of architectural development, and a development found exactly in that part of the world to which a specially powerful stimulus had been given by political and religious events.

As has again and again happened, after the stirring up of men's minds, which the circumstances of this new departure occasioned, had subsided, they here fell into a very regular and unchangeable order, and Byzantine architecture has continued, without much modification or development, to prevail in those Eastern parts of Christendom where the Eastern Church holds sway, even to the present day. In the West it has not been so.

The Romanesque division of Early Christian art was not, as has been said, so strikingly original, and its development was long hindered by the invasions of the northern hordes which overran Europe. Later on, however, after it had become the universal style of all Western Europe, it met with influences which varied it, and in some countries, especially in Germany, it was carried to a high pitch of perfection.

Meantime, however, leaving out of notice in this hurried sketch other interesting forms of Christian architecture based on Roman—such, for example, as the one which is to be found in the ruined cities of Central Syria—we will, if you please, come down to the next prominent new departure in the art, one of extraordinary interest and splendour, but less familiarly under observation.

Arabia was the country in which a new religion and a new seat of empire rose with a marvellous rapidity, and from here the Mahommedan faith spread, and gained a hold on half the Oriental nations of the globe, such as has not relaxed for more than a thousand years. It is true that we might almost have left Mahommedan architecture out, as not a European phenomenon, although it was ultimately brought into Spain by the Moors; but I could not well omit such a wonderful instance of a new departure, the more so that, as the original materials out of which the Moslem architects elaborated their style were, to a large extent, the lingering traditions of that Roman manner of building which had become practically universal, and, as we have just seen, had furnished the basis on which Christian architecture stood; and that the Mahommedan invention of the pointed arch reacted on Western Christendom at no very distant date.

Some at least of the peculiar beauties of the buildings of the followers of the Prophet seem due to an innate faculty for designing and executing decoration, which the Arabs, the Egyptians and the Persians appear to possess. At any rate this was stimulated and drawn out by the extraordinary impulse given by Moslem conquests and Moslem conversions among the nations where mosques began to be built. No phenomenon in history is more startling, and nowhere is a more brilliant and more startling display of energy met with. A new departure could hardly be more completely made than was made by the followers of the Prophet, and a more complete recasting of known features into new forms, and a more remarkable creation of new ornaments and original decorations has never shown itself on the civilised globe. The dome, the pendentive, the arch, the column, the rough construction encased in plaster, are all derived from Roman methods; but in no case do they look like the same things as in Roman buildings. The arches are pointed or ogival, the domes are often pointed, the pendentives are masked, the openings are filled with tracery and coloured glass and the methods of clothing the rough structure with ornament are very dissimilar; while the surface decorations, the pierced stone and metal panels, the wooden gables, the tiles, the inlays, the mosaics, the coloured and gilded plaster stalactite work, the nook shafts with their capitals—these all are new and charming creations, as original as they are beautiful.

The next new departure in point of time is one which affects Western architecture and which got its impetus largely, though not exclusively, from the indignation roused in Western Europe by the progress of Islam, yet got its chief feature from the East. Jerusalem was in the hands of the followers of the Prophet, and the Crusades undertaken to rescue the Holy Sepulchre from this profanation were embarked upon by all Christendom with a zeal which was partly religious, partly fanatical, but all-absorbing, and which roused Europe to the most extraordinary pitch of excitement. The first Crusaders came back, having seen the Arab buildings in which the pointed arch was in use, at a moment when the architects of the West were much in need of some such feature. The Crusades were, however, not the only outcome of the religious zeal of the eleventh and twelfth centuries—they were not merely the most conspicuous development in which it showed itself, but they also served to react upon it and keep it alive. From various causes the founding of religious establishments, or the recasting of them on larger lines where they already existed, began to be one of the chief occupations of European energy soon after the year 1,000, and this work, in various phases, continued for from four to five centuries, a long period of activity compared to almost any other architectural period.

We in England have admirable opportunities of observing the whole development of this interesting time, and nothing is more surprising than to note, as one compares the buildings of one part of this period with others a little earlier or a little later, how continually the architects were taking a new departure, and what scant care they mostly had for the work that lay behind them, so long as they could do something different to what was in hand at the moment. They forgot, perhaps, that the generation to follow, or even in some cases they themselves, would turn an indifferent eye upon what at the moment seemed so new and so good in the excitement of a fresh modification or a new idea.

Leaving the larger field of European art, let us, now that the subject can be illustrated by examples well within our own reach, consider the successive phases through which English art went during this time. We possess still a few scattered examples of that phase of primitive Romanesque which we generally call Saxon. England, as you know, though the fact is often forgotten, England as she is at the present day is the most startling tribute to the value of Christian missions to the heathen that the world can exhibit. The results of the missions which planted Christianity in this country at an early date are to-day of incalculable and growing magnitude. Even in the far-off times before the Norman Conquest there were many churches and monasteries scattered all over Great Britain; but the country was very poor—in many cases these buildings were of timber, or timber and reeds. Even where they were of more solid materials, they were usually small, rude and inconvenient, and in nearly all cases they have been superseded. Remnants, however, linger sufficient to give an idea of what was being done.

Suddenly the Norman Conqueror appears on the scene. The country is taken possession of by strangers, who seize upon its resources, whatever they were, and turn them to their own profit. In a comparatively short space of time Norman castles began to make their appearance, and in almost every parish in England a church is built or rebuilt, and in many of the leading cities a cathedral. It is perfectly startling to find how great the building activity of the period following the Conquest was; and it is in accordance with the principle which I am bringing under your notice, that this new departure resulted in an architectural development of great energy, if of varied excellence. The earliest buildings resemble those which were at the same time being erected on the other side of the channel in Normandy, from whence the invaders had come; but very soon indeed peculiarities begin to develop themselves, and Anglo-Norman became a distinct and well-marked architectural style with an extremely pronounced character and beauties all its own. In very few cases does an important Norman building survive unaltered, but such a cathedral as Durham will serve as an illustration of what many of our great churches were at the moment of the fullest development of the style.

At the end of the twelfth century the churches that were built were large in plan. When circumstances allowed they were grandiose. The religious establishments were planned with great completeness, and often of vast extent. The castles, on the other hand, had not yet become, as a rule, extensive; they were still mostly isolated towns, very strong, but without outbuildings.

In a church the piers were large, often heavy; the arches semicircular; the vaulting groined, as the Romans had formed it, but almost always confined to very moderate spans. The carving was barbarous, but rich and distinctive features, such as the chevron or the bird's beak, though admitting endless modifications, were not departed from. The masonry, of very regular execution outside, was often but a skin to cover a large mass of rubbish very poorly put together, and the enormous mass of the piers and walls being obtained in this way gives an air of overwhelming strength, which the behaviour of the buildings under the test of time and weather has not always borne out.

From the time when the pointed arch came in the architectural history of our country and of France, and to a large extent that of other countries, gives a series of new departures of the most interesting and pleasing kind. What we are accustomed to call Early English Decorated and Perpendicular are phases through which Mediæval architecture passed, under a stimulus which lasted for more than three centuries after the introduction of the pointed arch. Of course many causes concurred to keep up the great building zeal of the Middle Ages, but that zeal in itself is not sufficient to account for the eagerness and skill with which new forms, new mouldings, new enrichments and new vaults were elaborated, each one rising out of the one immediately preceding it, and taking its place, and for the rush after novelty kept up so long; and I think what

may perhaps be called the artistic impulse came more from the sudden introduction into architecture of a new and unthought-of feature than from any other definite cause.

It is worth remark that, so far as one can form an impartial judgment, the pursuit of change did not by any means always mean the attainment of growth. Early English was, on the whole, a finer style than either of those that followed it, and I think most judges would also admit that Decorated was finer than Perpendicular. What was secured was vitality and change, not necessarily advance.

We come now to the remarkable influence out of which has grown the modern world, and to which we generally apply a French name, the Renaissance. Here, if anywhere, we have a new departure, wide-spreading, far-reaching, full of energy, affecting not only the arts, but literature, science, religion and politics. That side of it which presents itself to our notice to-night consists of a return to the forms of Classic art in painting, sculpture and architecture, begun in Italy and spreading through all Europe. In the sister arts, as in literature, this return soon formed a fresh starting-point, and modern painting, and not a little of modern sculpture, has followed original lines of development which have led to the establishment of European schools —schools which, on the whole, have reflected more or less faithfully the varying changes of modern thought and culture. Architecture has been less fortunate, and it is difficult to say why. The fact, however, remains that from the sixteenth century to the nineteenth we have done nothing but revive past styles. From time to time brilliant results have been obtained by mixtures of styles. What, in a very different parlance, is termed a "blend" has more than once not only produced good buildings, but appeared to be likely to originate a style of modern architecture, but it does not seem to take hold, and Europe has gone on erecting buildings for all sorts of modern purposes, and sometimes with the greatest originality in their adaptation to their purpose, but all clothed in the dress of some bygone style. I am, of course, speaking broadly, and I do not wish to detract from the many excellences of much modern work, but it is to be heartily wished that there was more of it which one could not so readily refer to some original. In our own country, for example, we have had a recent Queen Anne revival—that is to say, a revival of Dutch architecture as originally introduced by William of Orange. Previous to that we had a Gothic revival, beginning with Tudor and working more or less steadily back. Before that, the revival of mature Italian had filled Pall Mall with the club-houses; a little further back was the Greek revival, and previous to that the Palladian one, and so on.

And yet, while all this has been going on, events have occurred which have constituted a new departure, of which Great Britain has served as the starting-point. Steam by land and by sea, telegraphs, cheap literature, and all the circumstances of our new day have caused a rapid accumulation of wealth, and occasioned numberless fresh needs which have stimulated building to a remarkable extent, but have left architecture but little affected. The modern mind has been more influenced by the vast strides which science has made than by anything else, and we, perhaps, ought not to be too much astonished that our vast systems of railway constructions exhibit consummate skill and but meagre art, though it is none the less a matter for regret that it should be so.

After all, perhaps, we are not without indications that something like a new departure in architecture is possible—that a twentieth-century style may exist. If you look at representations of the best buildings in America, you see works largely bearing the impress of one man's genius, but which are original as well as excellent, which all hang together by a certain resemblance to a type, and yet possess individuality, character, and what the French call *cachet*. If a modern style of architecture is to arise at all, America is a country which seems to offer a very likely field for it to grow in. The country is a new one, the people are fresh, they aim at cultivation, but most at originality; they are able to dispose of great wealth, and their architects are men of very high culture indeed. If to these conditions we add a climate different from that of Europe, and which would consequently make it undesirable to transplant European buildings to America, we have a combination from which I confess I both hope and expect great things.

A second example of something like a new style of architecture has been lately seen by many in Paris, where new materials have been employed under new conditions, and with very striking results by our artistic neighbours the French in their great exhibition buildings.

The conditions of an International Exhibition were met by us in 1851 by a temporary structure exhibiting very great ingenuity, and in which the qualities of glass and cast-iron were turned to good account; but, unfortunately, though the thing was a novelty, it was only a temporary structure of the cheapest sort, after all, and did not advance architecture. The French, in their exhibitions have always been more ambitious, and I think many of those who have seen the buildings erected for the 1890 exhibition, and still standing, will feel that the architect, making the utmost use of the structural properties of iron, and of the decorative qualities of ceramic slabs and tiles, metals, and other things which go with his construction, has gone far to establish a scheme of building quite entitled to be called architecture, and partaking of the dignity and solidity and stability which we look for in architectural works.

We ask in some anxiety whether we have any parallel to all this in our own country, and, if so, where are we to look for it? I think we may find such a parallel, though in a series of buildings not so ostentatious or colossal as those for the Paris Exhibition. There are not a few virtually new materials, and new combinations of materials, now in use in England, and there are undoubtedly many new situations or new developments and extensions of old ones. Iron, concrete, terra-cotta, faïence, encaustic tile, as we know them at the present day, are practically new materials, and some of them—like iron and concrete—are equal to two different materials each, or even more than two, according as they are manufactured.

It appears to me that in the employment of appliances which science has put within the reach of our constructors for such modern purposes as suggest, nay, demand, artistic treatment, we have the nearest approach to a new departure which has shown itself yet, and that here, if anywhere, we have a prospect that the twentieth century may perhaps attain a definite English style of its own. The most successful architect of the period now drawing to a close has been unquestionably the foremost to employ new inventions, or at least to give them a chance, and to him we owe it that the English people had an opportunity of seeing on a great scale in the Natural History Museum what wide architectural possibilities the employment of terra-cotta could introduce, and certainly the most original buildings of the present day and the most original designs for great buildings about to be erected seem to be based, as far as their structural peculiarities go, on the use of iron, and in respect of their artistic qualities on the free employment of terra-cotta. Here, I venture to suggest, is a chance for the architects of the coming generation.

At any rate I would very strongly urge on you gentlemen forming the audience who have your career as architects before you, that if a new departure comes in your time you are safer to go along with it than to stand aloof. It may, I admit, lead you astray, but as matters are at the present day it is far more likely to lead you ahead and to offer the best chance of doing good and original artistic work.

If then you, or some of you, are to work at the evolution of a new English architecture, original and good, and having for its starting-point the new or improved methods of construction, and the new and improved materials in use, or likely to come into use, it is almost self-evident that you must master the science of construction and the art of architecture or you will not be prepared for the task.

We have taken, in respect of professional matters, a new departure which has led to a considerable change in our internal economy as a profession. The Institute of Architects has obtained a new charter. Associates are for the future only to be admitted after examination, and two examinations for students are set up. All students who aspire to take a good position in this profession will desire to pass these examinations, and thus the point of view from which they regard their present position and opportunities will be considerably altered. This may or may not be an unmixed good, for a new departure—let me say it once more—is not certain to bring improvement. All that is certain is change. It devolves upon us all, then, to do our best to make the change advantageous.

Let me point to an example which shows that sometimes the changes from which a new departure may take its start may come suddenly. At the present moment the carpenters of London are on strike, and it seems clear that in important buildings iron will have to be substituted for carpentry in the roofs. How many architects are prepared at once to deal with the structural difficulty, and to design appropriate and architectural iron framework for the roofing which was to have been in timber? I do not know what answer ought to be given to that question, but it will, I think, be clear to you all that it is only those who understand how an iron roof is framed who would have any chance of being able to make such a change in their building lead to a good artistic result. If a man has not sufficient mastery of his roof to know how to make it structurally sound, how is it possible for him to make it architecturally good? On the ground, therefore, of being fully prepared, not only for the present course of practice but for possible changes, it seems to me more than ever desirable for architectural training to be thorough, and I think the opportunities for scientific education, concurrently with the architectural and structural classes which have been arranged for in this college, are eminently calculated to afford the means of such a training. Those opportunities I will in a few moments refer to more pointedly.

There is, however, another aspect of the matter of less real weight but of more immediate urgency, and nearer to every

student or intending student. I allude to the preparation necessary for passing the examinations established by the Institute.

You will, many of you, be desirous of passing the examination. I hope that you will all be even more desirous to fit yourselves for the practice of your profession. It is not quite the same thing. It is possible to pass an examination partly by cram and partly by luck, without being by any means well educated; but at the same time my honest feeling is that the men who fairly and studiously master the subjects in which the examinations are held, and who pass as the result of study of that sort, have done very much indeed to fit themselves for the practice of our profession.

Now, towards that sort of preparation this college is able to offer facilities which have not been available before. I have always wished for a means of supplementing such instruction as is given in the classroom by instruction at the drawing-desk, and now the liberality of one of the City companies—the Carpenters' Company—has provided a fund out of which the necessary expense of a teacher of drawing can be met, and we are to have a class for architectural drawing, including construction on the one hand and perspective on the other, which will meet two afternoons in the week, with the classroom open on other afternoons for practice. I hope some architects may spare their pupils on these afternoons to come and be systematically taught. I especially hope that students who are preparing for the Intermediate Examination and who consequently have a series of careful drawings to prepare as testimonies of study, will some of them come and prepare them under the careful eye of Mr. Stirling, who has undertaken to conduct this class, and who will co-operate with me and Mr. Elsey Smith in the direction of it. And I venture to suggest, though with some diffidence, that some young architects recently started, and who have the command of part of their time, might find it pleasant and advantageous to come and spend two afternoons a week at work which would improve and strengthen their powers as designers. I hope also that some students who are not yet articled to an architect, but intend to be so, may be found who will spend a session at the college. For such a course has been arranged, and what is called a "composition ticket" will be issued, covering such classes as will in the most profitable way fill up their time. This, supposing the student to be sufficiently grounded in mathematics, would cover as a rule graphics and graphical drawing, part of the courses of engineering, mechanics and physics, economic geology, the technology of building materials, surveying and levelling; in addition to architecture, construction, architectural drawing and applied art.

The Carpenters' Company has also enabled us to establish a night class for building construction, to be taught partly by way of lectures and partly by drawing, and this probably appeals to a rather different class of students. We hope to deal with the principal subjects of the examinations in construction held by the Science and Art Department, and to consider them in as practical a way as possible, so that the members of this class may find themselves able to draw plain—and perhaps difficult—construction clearly and intelligibly.

Of course, the two classes which for so many years have been conducted here will continue as before—the class for the study of architecture as an art, and that for the study of materials and construction; the class for practice is also in the programme, but it will not be held (as in former years it has) in the first term. These steps are not taken with a view to oppose the scheme of the Architectural Association, to which I wish all the success it merits, but they direct themselves to rather a different class of students, and I believe in London, with its large numbers, there is room for many organisations to work harmoniously.

There are always a certain number of students who have command of their own time in the daytime, that is to say, who for the time being are not doing office work, and these, I think, will find both the afternoon drawing-class and the scientific course to which I have alluded suit their requirements. Students coming from the colonies and from the country, as well as London students, will, I hope, find this course meet their requirements. I sincerely hope that some of my brother architects who take pupils may, as has been suggested, find it possible to send them to the college to be taught drawing. I have known several instances in which men of standing who took pupils were so impressed with the desirability of definite teaching of draughtsmanship and of architectural forms and details, and so forth, that they engaged a competent instructor to come and give lessons to their pupils. I believe the late Sir Gilbert Scott at one time did so. What we offer at the college is this kind of instruction adapted to the needs of pupils, only those who are to enjoy it must come to the teacher instead of his coming to them.

There is, however, another class of youth for whom I have always felt that provision should very often be made. I mean he who has just left school, who has devoted himself to architecture, or been advised to do so, and who has not yet embarked on the occupations which await him in an architect's office. He has in some respects been prepared for the profession, in others not; but in addition to the need of some special studies and of a training in drawing, he has to learn the management of his own time and the art of taking some care of his own education. A college session of the sort which has been sketched out affords the best possible half-way house between the organised regularity of a great school where the employment of every hour of the day is mapped out, and the entire freedom from all guidance as to his use of his leisure which a pupil in an office oftener than not steps into; not to mention the fact that, to begin his pupil career with some skill in draughtsmanship and in the knowledge of the scientific subjects that bear on the profession and some knowledge of architecture will be of extreme service to him, both at the outset in aiding him to pass the extreme examination at the Institute and throughout his whole student course.

You will notice that whatever new departure I advocate as to instruction, I do not suggest the idea that a practical profession like ours can be efficiently learned without such opportunities of seeing and taking part in practice as pupils enjoy, and as, so far as I can at present see, no other system than pupilage is likely to afford; and I am the more desirous to emphasise this, because at one time I held a rather different view, and the conclusion which I here advance is one which has been impressed upon me by experience. I know that in the medical profession it has been possible, and has been found of advantage to do away with pupilage, but that is only because fuller opportunities of seeing practice and taking part in it are afforded in the hospitals than were open to pupils in the practice of the medical men to whom they were articled.

Let me add one or two words about the evening class for building construction and structural drawing. I hope we may teach those who attend to understand how buildings are put together, and to make drawings to show clearly and legibly the nature of ordinary and, to some extent, of difficult structures. There are, of course, two ways of drawing construction—one is to enlarge, or copy, or reduce another drawing or an engraving in a book; the other is, from a knowledge of the thing to be drawn to represent it as it ought to be. Copying may or may not be instructive. It is difficult to copy a drawing without learning something, but it is possible to do it without learning much if it is done perfunctorily or blindly. But if a man is working from his knowledge of a piece of construction or from a description and sketches, and is putting that upon paper without having an exact original to reproduce, he is doing what is much more like the actual making of working drawings in the business of the construction, and he can hardly fail to extend his knowledge and to make it precise and exact.

To all engaged in architectural work a mastery of the pencil is more necessary than any other accomplishment or attainment. With the pencil chiefly we preserve our notes of what we learn. Whether it be architectural detail or construction, or both at once, we study them on existing buildings by means of the pencil; and a sketching tour is at once the most pleasurable and most profitable part of a student's or an architect's time. Again, it is pencil in hand that designs are made and structures contrived, and few, indeed, would be able to design even a simple piece of work had it to be thought out without the constant aid of the pencil, and, let me add, of the india-rubber. Once more, when the architect's own ideas are fixed, the whole thing, be it simple or be it complex, must be drawn if anyone else is to form an idea of what it will be like. It must be drawn out for the inspection of clients and of any authorities who may have a share in deciding how a structure is to be built; and, last, but by no means least, the whole thing is to be, so to speak, built upon paper for the guidance of the surveyors who estimate what it will cost, and of the builders and operatives who actually carry it out.

Of course, for simple works the requisite drawings need only be simple, in more complicated ones they will require to be anything but simple; but do not forget that as matters stand at the present day a mastery of the pencil, in other words good power of drawing, is essential to every architectural student. I think I may go further and say that to have a prospect of success as an architect and of rising at all in a profession where the competition is keen, a man must be not only a good but an excellent draughtsman. It is possible to be an excellent draughtsman and a bad architect, but in the present day it is not possible, I think, to be an architect without being a draughtsman.

It has not always been the case that facile and finished draughtsmanship was required of the architect, but I believe the circumstances of the present age render it essential, and I accordingly press drawing upon your attention as a matter of the utmost importance. There is much that has to be known, a good deal that ought to be seen, and not a little that should be read. But the things that require to be drawn, and the method of drawing them, are of paramount importance, and make a claim on your attention that nothing should surpass.

I am quite aware that in thus urging the importance of

drawing I am not saying anything new—not attempting a new departure—for all that I have said has been true for a generation past, and has been repeated again and again from the lips of men entitled to be heard with respect. But yet the topic of my lecture comes up in another shape, and, in fact, in the shape which first suggested a new departure as the subject of this lecture, for an architectural drawing-class is in this college a new departure. It has for long been my desire to see the way to attempt it, and now that the Carpenters' Company has rendered the attempt possible, it will be my most anxious desire that the class shall be furnished with students, and that the students shall gain the utmost possible benefit from the class.

THE ARCHITECTURAL ASSOCIATION.

THE annual conversazione of the Association was held at Westminster Town Hall on Friday evening, under the presidency of Mr. F. T. Baggallay, whose year of office will form an epoch in the history of the Association, owing to the inauguration of the new curriculum. The assembly, including members and ladies, numbered about 700. The hall, galleries and staircases to the upper rooms were sumptuously decorated for the occasion by various well-known firms under the general direction of the Entertainment Committee, and here mention must be made of the names of Mr. Brodie and Mr. Goldsmith. The reception of the visitors by the President began at eight o'clock, and, contrary to what heretofore has been usual, the weather was fine. In the large hall where the reception took place an orchestral stage, tastefully decorated with tapestries and palms, was erected for use of the band of the Coldstream Guards, who, conducted by Mr. C. Thomas, by permission of Colonel J. B. Sterling, played during the evening pieces by Gounod, Verdi, Balfe, Schumann, Tito Mattei, Sir A. Sullivan and other composers. The entertainment also included a Séance Magique by Mr. George Bayne, which was evidently appreciated, to judge by the merriment elicited from the audience. The feature of interest in each recurring conversazione is naturally connected with the prizes won in the past session, which are on the occasion first announced, the prize drawings being at the same time on view in the upper rooms. One of the rooms was also devoted to the exhibition of a selection from the designs sent in in competition for the completion of the South Kensington Museum. The authors of the designs exhibited were Messrs. John Belcher, T. E. Collcutt, T. N. Deane, W. Emerson, T. G. Jackson, Mervyn Macartney, Aston Webb (selected design) and W. Young. Dismissing South Kensington and its buildings from the mind, the most admired exteriors were those of Messrs. Belcher, Deane and Emerson. Some rubbings of fine old brasses and a selection of works by the late J. D. Sedding, illustrated by drawings and photos, were also exhibited. The list of prize-winners was as follows :—

A. A. Travelling Studentship.—Kotaro Sakurai.

Essay Prize and Medal.—1st, W. Wonnacott ; 2nd, J. A. Pywell (special), five guineas.

Cates Prize.—H. G. Gamble.

Lectures on the History of Architecture.—1st, J. Murray, three guineas ; 2nd and 3rd, not awarded.

Lectures on Construction.—1st, W. C. Waymouth, three guineas ; 2nd, H. G. Collins, two guineas ; 3rd, A. Stretton, one guinea.

Elementary Class of Ornament.—1st, C. E. Salmon, three guineas ; 2nd, A. Stratton, two guineas.

Elementary Class of Ornament.—1st, F. A. C. Smith ; 2nd, A. W. Jarvis ; 3rd, H. Jefferis.

Class of Design.—1st, H. G. Lidstone ; 2nd, J. C. Stockdale ; 3rd, W. A. Lewis.

Class of Colour Decoration.—1st, J. P. Cooper.

Time Sketch Prize.—M. Garbutt.

Class of Construction.—1st, H. E. Mathews, three guineas ; 2nd, J. C. Stockdale, two guineas.

Advance Class of Construction.—John Murray, three guineas.

Class for the Study of Quantity Surveying and Specification Writing.—1st, J. P. Clark, three guineas ; 2nd, W. B. Parry, two guineas.

Scholarships, Session 1891-92.—For first and second years' courses of the annual value of ten guineas, tenable for two years, E. A. Rickards and A. J. Stratton. For third and fourth years' courses of the annual value of ten guineas, tenable for two years, W. C. Waymouth and C. C. Winmill.

In furnishing and decorating the hall, &c., the following firms exhibited :—Messrs. Bontor & Co., Evans & Co., Felix & Wayman, Gillow & Co., Hayward & Co., Hindley & Sons, Jeffrey & Co., W. De Morgan & Co., Morris & Co., Pitman & Sons, William Woollams & Co. The electric lighting arrangements and fittings Messrs. Strode & Co. carried out, and the current was supplied by the Westminster Electric Supply Corporation. The exhibits included beautiful specimens of wall-paper decoration, tapestries, carpets, hangings, artistic upholstery and furniture, art metalwork, &c.

A leading feature in the arrangement of the hall was a handsome Oriental canopy erected by Messrs. Hindley & Sons in the centre of the hall, which formed an agreeable pavilion for the purposes of the reception committee. The canopy was supported by four uprights, one at each corner, and these consisted of Messrs. Hindley's well-known collection of specimen rugs, imported from various parts of Asia Minor, the seat of this ancient industry. The taste and elegance of these draperies were conspicuous, even among the many fine specimens of art workmanship exhibited. Messrs. Hindley's Indian matting was also a subject of much admiration, being displayed on the front of the gallery round the hall, and forming a very decorative frieze above the other collections on the ground-floor. In the arrangements great credit is due to the energy and taste of Messrs. Hindley's manager, Mr. Walter Purson, and also to Mr. C. A. Hindley.

The following particulars of the exhibit of Messrs. Wm. Woollams & Co. will be of interest :—No. 18,760. "Kelvin." A conventional poppy paper, printed in six transparent colours on green mica. Designed by Mr. G. F. Catchpole. No. 4,981. "Tuscan." Dado decoration in reds on a cream ground. Designed by Mr. T. W. Hay, and adapted for use in rooms or corridors, or on the rake on staircases. No. 18,768. "Asiatic." A well-arranged Indian design in bright colours on cream mica. Drawn by Mr. A. Silver. No. M 857. "Argyll." Ceiling-paper, raised white flock on blue ground. Designed by Mr. O. W. Davis for special use in rooms that are not rectangular, the pattern being free from rigid lines. No. M 813. "Pompeii." A design in rich red flocks, in which the difficulty of applying Pompeian ornament to an all-over filling has been successfully overcome by Mr. O. W. Davis.

Among various examples exhibited by Messrs. Jeffrey & Co. may be mentioned the "Cockatoo Decoration," designed by Mr. Walter Crane, a very rich pattern printed in various tones of red, forming a very pleasant harmony of warm colour. The "Strasbourg" pattern, a large conventional design by Mr. Lewis F. Day, particularly well adapted for halls and staircases. The "Lotus" pattern, designed by Mr. C. F. A. Voysey. Both of the foregoing were shown printed in coloured lacquers on a gold ground producing a very rich effect of colour. Also a large naturalistic pattern, by Miss M. Gemmell, of the chestnut blossom, in which the natural effect of the leaves and flowers has been cleverly produced; and two large damask patterns, one produced in soft tones of blue, the others in light yellows on a rich, dark yellow and gold ground.

A GLIMPSE OF GREECE.*

ONE is sometimes asked, "What am I to benefit from a visit to Greece? The time for building Greek temples is past ; that sort of thing has been tried and has not succeeded. Hadn't I better go to France, Italy or Spain, and see things more useful to me, be able to fill my notebooks with details that I can use up and make sketches of pieces of grouping that will come in handy?" Well, yes, perhaps so. If that is the only way you wish to study architecture it would be a pity to waste your time going to Greece. If you go to work thus, it is not likely that you will care about learning how the old architects worked and how they overcame their difficulties. But, if you want to try to do work that will live, then see the old buildings that have lived, that live still, and whose every stone has some silent tale to tell.†

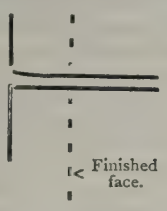
Then you may go and sit on the Acropolis at Athens and look at the Parthenon and the Erechtheum and away and beyond the stretch of Attic plain, the range of Hymettus and the white scars of the marble quarries on the slopes of Pentelicus. You may know your "Stuart" well, have probably drawn out carefully the orders, both Greek and Roman, and can possibly give an accurate definition of such words as "peristyle," "epistyle," "echinus," but I hardly think you can have entered into the spirit of how the old Greeks worked, and you possibly go about with a vague notion that they did everything by rule, that a column had to be so many diameters high and so much between each, and given the order it was an easy matter to build a temple right away. It has never occurred to you, perhaps, that there were difficulties of all kinds in the way, that schemes were altered after they had been started then as now, there as here, or very often never carried to completion.

But when you have once had a day or two on the Athenian Acropolis your former conceptions are entirely altered. You now begin to understand for a fact that the walls and floors of the Propylæa were never finished, that to-day, after these more than two thousand years have elapsed, the rough surface of the

* An article by Mr. R. W. Schultz, published in the "A. A. Notes."

† I do not say Greek buildings only, by any means.

marble, which was never dressed down, still remains; you see that there is only a finished margin of about an inch or an inch and a half all round, and that the horizontal joints of the remainder are slightly sloped on the upper arris to prevent accidental pressure in setting and flaking off of the front edge.



Again, round the foot of the columns you observe a circle or square of dressed surface and a little channel cut between it and the edge of the step, in order to let the water run off till such a time as the general surface of the floor could be dressed down to the finished level. Then you begin to think why this was so, and you remember that the days of the Peloponnesian War were at hand, and that the money, which ought to have gone to finish this, was wanted to fight the Spartans.

Then you try perhaps to reconcile yourself to the use of the two orders simultaneously: the Ionic order—in this, its perhaps finest example—to support the great stone beams of the inner hall, and the Doric for the other porticos; and it begins to dawn upon you how fine that coffered ceiling to the hall must have been with its gold and colour as seen by the old Athenians approaching from below; and you can, from your own experience, feel how welcome must have been the stone benches, which stood along each side, after the steep ascent. As you sit on the steps your gaze wanders outwards, over the plain below and the olive wood, towards Salamis, lying close to the shore, then closer at hand; you observe more carefully the little Temple of Victory standing out on its bastion on your left hand, the shrine, as Mr. Stillman would like us to believe, of the deity of the Louvre which is known to all of us by the name of the Venus of Milo. A little further examination shows you that this building is a later addition, that originally the two flank substructure walls of the Propylæa were similar, and that this bastion was built afterwards to hold this delightful little temple.

And when you have done resting on these steps, you wander round towards this small temple, and as you go through the south hall of the Propylæa, on your way you cross the place where an earlier altar had stood, and which the builders of the Propylæa wished to remove, but the decree evidently went out against them, for we see how the plan of the hall was altered to allow it to remain. Further round behind this are the remains of the earlier Propylæa and part of the still earlier cyclopean wall of the Acropolis, built of large polygonal stones carefully fitted together.

And now we find our way back again into the great hall, with the sloping way for the chariots passing through the centre between the rows of Ionic columns, and we go through one of the five gateways, now stripped and bare, but once filled with bronze doors and linings—doors so large and heavy that they used to creak on their hinges in opening, as an ancient writer tells us—and you see before you the surface of the Acropolis, perhaps, if it is spring, covered thick with great white and yellow daisies, and beyond are the Parthenon and the Erechtheum.

As you pass out of the Propylæa by its inner portico you observe a low circular pedestal against the southmost pillar. This once supported a bronze statue of Athena as Goddess of Health. Plutarch tells a very pretty tale of how a workman fell down from the roof at this spot and was seriously injured, but the goddess appearing to Pericles in a dream, prescribed a remedy which cured the man, and so this statue was erected as a grateful thank-offering. The pedestal remains with the inscription and the holes for the feet of the statue, but the figure itself was of bronze, and so long ago has found its way to the melting-pot. Before going on let us turn round to the right and see the unfinished outside face of the wall of the Propylæa, with the large projecting nogs left on each stone in order to facilitate its carriage and fixing, and over there on that corner you observe a practical difficulty of site, a corner which would have encroached on a neighbouring sacred enclosure, and so it was corbelled out over; and here we see, too, the site of what was intended to be a large inner hall, a similar one having been proposed on the north side also, and there is the anta for the colonnade and the hole for the roof beam, but nothing further had ever been done. Whether ancient rights came in again, or whether it was want of funds, we cannot say.

And now we begin to follow up the sacred way which is formed on the rough rock, with lines cut across to give a foothold for man and beast, on each side being the sinkings cut in the rock for the rows of votive tablets and dedicatory inscriptions which lined the route; and here on the right is the entrance to a sacred enclosure with steps also cut out of the solid rock. On your left are one or two of the blocks of what was once the pedestal of the great bronze statue by Phidias of Athena Promachos, the Fighter in the Van, which was 66 feet high and overtopped the roof of the Propylæa, and which formed a striking landmark to the distant mariner, its gilded lance point glinting in the sun.

As you slowly approach the Parthenon you cannot but be struck by the beautiful roundness of line all through, no angularity or crudeness anywhere; and now the value of the slight curve to the horizontal lines, the inclination to the columns and entablature and other geometric niceties which Penrose has so carefully analysed, begin to dawn upon you. How beautiful, too, is the mellow colouring of the Pentelic marble against the blue sky.

But, before going on further, turn aside once more for a minute to examine the fragments of the entablature of the Propylæa, which are lying in the adjoining enclosure, and observe the remains of the bright colouring, red, blue, green and gold, which formerly covered it all. You wonder why the Greeks hid such a beautiful surface as that of the marble of Pentelicus with colour or covering of any kind, but you must remember that Pentelic marble was first used by them as a material of greater strength and durability than the old Poros stone which they had been content to build with in pre-Persic times, its beauty for its own sake dawning on them later. I don't think, however, that at any time they entirely discarded the use of colour on it, although they probably used it more sparingly.

We may now go on towards the Parthenon, and we take our way along the north side to the east end, passing by the Erechtheum and its Porch of the Maidens, to be seen later on. Standing where you can see the eastern portico, your imagination, perhaps, carries you back to the time when the great temple was complete in all its grandeur. It is a feast day, and on the architrave great garlands of fresh flowers are hanging down, or are wound in bands round the columns, and up that deserted way by which we have just come, the citizens are hurrying to pay their devotions at the shrine of their virgin goddess through ranks of votive tablets and bronze and marble groups of gods and heroes.

Entering, we pass to-day through no bronze gates, nor do we see in the dim light the lamps and the white-robed priestesses, and the great gold and ivory statue of the goddess, but only the ruined walls and the marble pavement, showing the marks of the Venetian bombs and the place where the statue stood. There also are the marks of the runners of the great gates still in the pavement, and round close to the edge of that slightly raised side-pavement are to be dimly traced the outlines of the internal columns. "Dimly traced," you say. "Why they are quite clear and distinct." No, these are the lines of the pillars of the Christian church, and the others are only to be seen by carefully looking for them. For we must remember that if the Parthenon was for nearly 900 years the shrine of Athena, it was for another 900 years more the shrine of another virgin, the Theotokos, the Mother of God, and that what had been the great temple of the pagan Greeks became the great church of the Athenian Christians. Almost on the spot where the lines of the doors are visible stood the great Christian altar, and projecting out into the pronaos, you can see the lines of the Christian apse, which had in its dome a beautiful representation in mosaic of the Blessed Virgin and the infant Christ. Round its sides were the seats for the priests and the throne for the bishop, an old Greek marble seat, which had been utilised for the purpose, and which is still to be seen in the museum close by. And if we walk along to the west end, where the cella wall still remains, and which contains on the outside the only part of the frieze which Lord Elgin did not walk off with, we see on the inside face, in what had been the opisthodomos of the pagan temple and the narthex of the Christian church, rows of nimbused saints painted on the marble wall; and outside, cut in or painted on the western wall and on the columns, are the records of the various bishops who occupied the See of Athens in Christian times.

Here also is the one trace of Turkish occupation which alone, on the whole Acropolis, has been left by the Greeks of to-day, who, in their desire to make their Acropolis look like what it was in the golden era of the fifth century B.C., a desire for obvious reasons impossible to be realised, have destroyed almost all the marks of succeeding history, whether Christian or Turkish. This one relic of the Turkish times is the lower part of a minaret; for after having been successively Pagan temple and Christian church the Parthenon became a Mahommedan mosque, and finally a powder-magazine, and so met its fate during the Venetian bombardment of 1687.

But before we leave the Parthenon we ought to glance at the substructure and see how the old foundations of an earlier temple were used as a basis for the present building. The earlier temple had been longer and narrower, and if we examine the extra piece added on to the width we shall see that it has been executed in quite a different manner to the other. It is curious to notice that, while the superstructure of the Parthenon of Pericles is so perfect in workmanship in every way, the piece

of foundation which was added to the careful superstructure of earlier date is curiously rough. True, it was intended to be covered up, but still the contrast is striking. To show how steep the natural Acropolis slope was, I may mention that at the north-east angle of the Parthenon the foundation rests straight on the solid rock, which was cut out level to receive it, and at the south-east angle, a distance of 120 feet, the substructure wall is 35 feet deep.

If we had time we might go on to the Erechtheum, certainly the most puzzling of all Greek temples, and try to get at some of the reasons for its curious irregularity, and admire its great beauty and grace of proportion and detail, and while we were there we might examine the part of the Acropolis wall close by, which is built of ruins of old columns and pieces of old entablature from one of the early temples destroyed by the Persians, and which was evidently run up in a hurry in order to be ready for the expected advance of an enemy. Then there is the museum to explore, with its array of archaic statues bearing remains of colouring on their carved draperies, its great sculptured pediments of early temples recently dug up, its large collection of archaic architectural fragments, and a thousand and one other things all full of interest and worthy of study. But it is impossible in a short paper to go further. Perhaps on another occasion I may have some more to say about the old Greeks, but better still, far better, go and see their great works for yourselves in their own clear Athenian atmosphere, and not only see them, but study them stone by stone, and if you go about it in the true way you will carry the impress of their teaching with you from that time onwards.

THE LATE VINCENT VELA.

THE death is announced of Vincent Vela, the Italian sculptor, who expired at Lignoretto, in the canton of Ticino, in his seventieth year. He was the son of poor peasants, and was born at Lignoretto in the year 1822. At the age of twelve he was employed in a stone quarry, but soon manifested a great aptitude for sculpture. Through the aid of friends he was sent to Milan in 1836, where he was employed in the works for the restoration of the cathedral. He studied the art of design with great ardour, and was placed with the sculptor Cacciatori. Being needy, he was often obliged to work through the night in making models for the goldsmiths. In 1848 he took part in the sculpture competition at Venice and carried off the prize, his subject being a bas-relief, *Christ restoring the Daughter of Jairus*. Vela had already executed several important busts when his statue of *Prayer* achieved for him a wide reputation. He proceeded to Rome, where he modelled his *Spartacus*, but, being of Swiss origin, he was recalled almost immediately to the Ticino, to take part in the war of the Sunderbund. In 1848 he assisted as a volunteer in the war of Italian Independence, and distinguished himself at the siege of Peschiera. On the conclusion of the campaign he returned to his studio and executed his noble statue of *Spartacus*. This work, which was acquired by the Duke Antonio Litta, attracted great attention at the Paris Exhibition of 1855. Named a member of the Academy of Fine Arts at Milan, Signor Vela declined this title, and proceeded to Turin, where he executed several statues, including those of *Hope* and *Resignation*. At Bergamos he finished his *Harmony in Tears* for the monument to Donizetti. At the Paris Salon of 1863 he exhibited a group in marble, *France and Italy*, which was presented by the ladies of Milan to the Empress Eugénie, and earned for the artist the decoration of the Legion of Honour. Many of his other works were also exhibited in Paris, where he obtained a first medal in 1867.

CHURCH BUILDING AND RESTORATION.

Carshalton.—The foundation-stone of a new chancel in All Saints Church, Carshalton, has been laid by the Duchess of Albany. The work was rendered necessary by the insecure and decayed condition of a large portion of the fabric of the church. By the proposed enlargement the seating capacity will be doubled, the church at present accommodating 500 persons. The estimated cost is 10,000*l.* Sir Arthur Blomfield, A.R.A., is the architect.

Oldbury.—The foundation-stones of a new church have been laid. The church will consist of a nave, chancel, organ-chamber and vestry. Messrs. Wood & Kendrick, West Bromwich, are the architects, and Mr. Willcock, of Wolverhampton, the builder.

Leeds.—The foundation-stone of the memorial church, St. Aidan's, at Roundhay Road, has been laid. The church, which will be of the Basilican type, will be constructed from plans prepared by Messrs. Johnson & Crawford-Hick, architects, Newcastle-on-Tyne and York. It will be built of red brick, with stone dressings, and the whole of the external architectural adornment will be at the west end. The nave will be 152 feet long and 40 feet wide, the aisles 11 feet, and the total width will be 67 feet.

Cardiff.—The completion of St. Catherine's Church, Canton, including a large chancel and choir, south chancel, aisle, organ-chamber and vestries, is about to be commenced. Plans have been approved of and tenders received, so that this long-looked-for improvement is about to become a reality. The architects are Messrs. Kempson & Fowler, Llandaff.

Fenton.—To celebrate the jubilee of the parish church at Fenton it was decided in 1889 to rebuild the structure. The designs for the new church were prepared by Mr. C. Lynam, of Stoke-on-Trent, diocesan surveyor. The work has been successfully carried out. The new church consists of nave and six bays, with clerestory and aisles and north and south porches; a chancel, with a chapel on the south side and a clergy-vestry on the north; also a north transept, containing a choir-vestry and an organ-chamber. A tower is designed for the west end of the nave, and the foundations for it have been put in. The church will accommodate about 1,000 worshippers. The walls throughout are of brickwork, with facing of the same material, except that the interior of the chancel is of stone. All the dressings are of Hollington and Wall Grange stone. The style of the church is what is known as Decorated. The cost of the building, exclusive of the tower, will exceed 6,000*l.* Messrs. H. & R. Inskip, of Longton, were the contractors.

GENERAL.

The Sixth Annual Exhibition of original paintings in oil and water-colour by members of the Southampton Art Society has just been opened.

Lord Rosebery has promised 1,000*l.* towards a park or recreation-ground for the town of Epsom.

An Oak Chancel Arch, supported by angels, and which was designed by Mr. Fellowes Prynne, has been erected in the church of St. Austell.

Mr. Louis Fagan, of the Department of Prints, British Museum, will deliver a course of three lectures on the art of engraving at St. George's Hall, Langham Place, on the evenings of Tuesdays, the 20th and 27th, and November 3. The lectures treat:—(1) Of line engraving; Early English school, Strange, Woollett and Sharp. (2) Etching; Rembrandt, Méryon, Jacquemart and Whistler. (3) Mezzotint; specially as applied to the representation of types of English female beauty portrayed by Reynolds.

Mr. Burke Downing, A.R.I.B.A., asks us to state that he has removed from 26 Craven Street to 175 Strand, W.C.

Sir Spencer Ponsonby-Fane, K.C.B., has during the past few weeks made his usual inspection of the theatres under the Lord Chamberlain's jurisdiction. He was professionally assisted by Mr. Frank T. Verity, son and partner of the late Mr. Thomas Verity, who for many years filled the post of surveyor of theatres to the Lord Chamberlain.

A Partnership has been entered into by Mr. Arthur H. Mackmurdo, Mr. George Hornblower and Mr. E. Stanley Walters, architects, under the style of Mackmurdo, Hornblower & Walters. Their places of business are 94 Charlotte Street, Fitzroy Square, W., and 15 Lord Street, Liverpool.

The Old Monastery Church at Edington has been re-opened after restoration by Mr. Ponting, diocesan architect.

Mr. H. O'Connor read a paper at the meeting of the Society of Engineers on Monday evening, Mr. W. N. Colam, president, in the chair, on "Retort Charging and Discharging Machinery for Gasworks."

The Bridge over the Kelvin at the Great Western Road, Glasgow, which has been constructed at a cost of 45,000*l.*, has been formally opened for traffic by the Lord Provost of Glasgow.

We are requested to state that Messrs. Lumleys, the well-known firm of auctioneers, of 22 St. James's Street, London, S.W., who have carried on business for the last thirty-eight years at that address, have no connection with a firm of a somewhat similar name who have lately opened in the same street.

The Benchers of Lincoln's Inn are having the piece of open ground in Old Square, on the north side of Lincoln's Inn Chapel, converted into a grass plot, which will be enclosed with handsome iron railings.

A South Transept is to be erected at Holy Trinity Church, Oswestry, by Miss Longueville, as a memorial to her late father, Mr. T. L. Longueville, of Penylan, Oswestry, who was one of the original founders of the church, and, during his lifetime, one of its principal supporters. It is proposed to build a corresponding north transept, also as a memorial, by subscription.

The Architect.

THE WEEK.

In the competition for the Cork Court-house the design marked "Fiat Justitia" has been placed first by the assessor, "For Auld Lang Syne" is second, and "Order" is third. As the joint committee have not as yet accepted the arrangement the names of the designers are not divulged, but it is understood that Mr. W. H. Hill, of Cork, is the author of the first design, and Messrs. T. N. Deane & Son, of Dublin, are credited with the second. Mr. Drew, the assessor, says he has had no clue to the authorship of the designs.

The fourth season of the successful Architectural Association Lyric Club, which now numbers over one hundred members, will be inaugurated by a smoking concert on Friday next, the 23rd inst., at the Mona Hotel, Covent Garden, commencing at 7.30, for which occasion Mr. A. C. Bulmer Booth, the president of the club, has arranged a capital programme. Members of the Architectural Association desirous of joining the Lyric should communicate with the hon. secs., Messrs. T. Moore and J. D. Scott.

The explorations which M. Champoiseau has conducted in the island of Samothrace, in the Ægean Sea, at the expense of the French Government, may be considered as a failure. It was anticipated that some memorial of the victory or of Pelasgic or other ancient settlement would be unearthed, but all that has been met with are some fragments of sculpture belonging to the fourth and fifth centuries, which are to be handed over to the Museum in Constantinople.

The twenty-third report of the Metropolitan Wesleyan Chapel Building Fund is interesting on account of the summary in it relating to chapel building since 1733. In spite of all the enthusiasm he excited, only one Methodist chapel—in the City Road—was built in London during the life of John Wesley. In the first half of the present century there were twenty-five erected. The donation of 50,000*l.* from the late Sir Francis Lycett, and the gifts of the late Sir William McArthur helped to cause a change. Within the last thirty years about eighty-five new chapels have been erected, with Sunday-schools, lecture-halls, &c., at an outlay of not less than 650,000*l.* This result is mainly owing to the operations of the Metropolitan Church Building Fund, through which more than 200,000*l.* has been expended in the shape of grants and loans. During the past year the committee report a total income of 15,940*l.* The grants and loans have been as follows:—Brentford, 600*l.*; Wimbledon, 377*l.*; Bassein Park, Bayswater, 500*l.*; Hendon, 500*l.*; Tooting, 515*l.*; Lower Sydenham, for site, 900*l.*; Hornsey, 600*l.*; Barry Road, 175*l.*; New Barnet, 425*l.*; total amount, 4,502*l.* New chapels have been opened at Staines, Kingston-on-Thames, Enfield and Hendon, and others are in course of erection at High Barnet, Walham Green, and Upton Park, in the Canning Town circuit. Thirteen sites are held in various parts of London, and await occupation, the loans advanced on these amounting to 9,140*l.* The metropolitan districts have received financial aid in the form of loans and grants as follows:—First London district, 68,447*l.*; second London district, 75,350*l.*; third London district, 59,400*l.*; making a total advance of 203,197*l.*

Many of our readers may not be aware of the existence of the Ex Libris Society, its mission being the collection of book-plates, and, like other societies, it has a journal. The last number contains an interesting article by M. Octave Uzanne, which recalls the old story about the use of ruffles by gentlemen who are not possessors of shirts. Victor Hugo's book-plate is characteristic of the presumption of the man. Notre Dame on a dark night serves as a background to his name, and across the plate is a crooked flash of lightning inscribed "Ex Libris, Victor Hugo." But as he held himself to be omniscient his stock of books did not amount to fifty volumes, and the necessity of a book-plate is not apparent. The rules which are applicable to the lives of ordinary mortals will not, however, serve with Hugo. His countrymen have accepted him as a literary Danton, forgetting that he offered his "Notre Dame de Paris" and his Academy discourse to an *auguste roi* of Prussia as evidence of his sympathy and admiration. In fact, his Republicanism was as unreal as his library. Gambetta in many ways was like Hugo. He, too, had a book-plate which was designed by M. Legros, but nobody is able to say whether he possessed any books. Frenchmen, being fond of fame, are very anxious to have plates that will make people think well of their taste. In spite of many trials, Champfleury's plate was not brought to perfection until the owner had passed away. Another collector has had five or six varieties prepared, and M. Paillet was so dissatisfied with all those he commissioned that now he prefers to write his name with his own hand in his books, and leaves the engraved plates to be fought for by collectors. In fact, M. Uzanne doubts whether any bibliophile can be satisfied by any effort of a designer or engraver, and there is a tendency now to make the plates very small, as if to conceal defects. The English contributors have not the skill of M. Uzanne, but their communications may have more value for the initiated. The interest taken in book-plates is evident when it is found that no less than seventy new members were enrolled at the meeting on September 24.

On Saturday the fourth annual exhibition of the South Wales Art Society and Sketching Club was opened in Cardiff by Lord Windsor. His lordship, in his address, contrasted pre-Raphaelites with the modern Impressionists. The former, he said, had an object in view, and they drew the attention of English people to the fact that artists must really learn to draw and paint things as they were before they could learn to select what they should paint. The Impressionists had also a particular object in view. In many cases they also had overstated their case, and had produced pictures that to most people were unintelligible. At the same time their object had been, in contrast with the pre-Raphaelite school, to produce the personal impression of nature—the subjective view of it, if he might use a rather commonplace antithesis, instead of the objective view. The great danger of the Impressionists, he thought, was that those who followed them might be induced to take up the method as a cloak for ignorance. In drawing a thing it was very much more easy to make a smudge than to draw correctly. But this was absolutely certain, that it was only those who knew thoroughly how to draw everything that they saw who were capable of making those smudges, and leaving out what they did not want in a picture. The great value of these different schools and different methods was that it made art in this country more universal; it prevented a running into any particular groove, and it enabled the beauties of the various classes to be seen both in this country and on the Continent. From the French there was very much to learn. They had for years taught painting in a consistent manner, and the result was that most great English artists had had at one time or another to go to France to study. The result was also, he (Lord Windsor) supposed all would admit, that the French were in advance of the English. Still, it must be remembered that technical beauties were not the only thing to be aimed at. It was no use flaunting technical prowess before the public by producing a picture simply for the sake of technical qualities.

M. Christian Labouret, who was one of the best known of the architects and contractors—a class of men that are much esteemed in France—has died in Paris in his seventy-sixth year. The great work of the completion of the Louvre under Visconti and Lefuel, which realised all the credit that was anticipated from it by Napoleon III., was carried out by M. Labouret. It is needless to say his name is ignored by writers who have described his work. He also constructed the block of shops known as the Louvre, which has brought so much profit to the owners, and the Grand Hôtel, in which the style of building becomes an important factor.

ANCIENT WESTMINSTER.

THE Griffin Monument, which has replaced Temple Bar, divides Westminster from London at one point, but to most people in the Metropolis Westminster is taken to be the district that is in the neighbourhood of the Abbey and the Houses of Parliament, and in course of time it is doubtful whether the word will have any other designation. At present few would speak of the terminus as Victoria Station, Westminster, although the approach, Victoria Street, is always likely to have the name of the district associated with it in order to distinguish it from Queen Victoria Street. There is less chance of Hanover Square, the Strand, Covent Garden, Trafalgar Square, Hyde Park being accepted hereafter as forming part of the ancient city, unless in documents where extreme accuracy is needed. If Westminster could be imagined as being sensitive, it would not suffer much by the narrowing of its boundaries. The fact is that few cities in England have undergone more changes, for it has been undergoing enlargements and restrictions for nearly a thousand years.

The first attempt to define the boundaries so far as is known was made by King Eadgar. In a charter, dated A.D. 951, the outer line of Westminster was said to be "First up from Thames, along Merfleet to Pollen-stock; so on to Bulinga Fen; afterwards along the old ditch to Cowford; thence up along Tyburn to the broad military road; thence along the road to St. Andrew's Church; next within London Fen south to mid-stream of Thames, and along the stream to Merfleet." The genuineness of the document has been often doubted, and the points marking the boundary formed the subject of many a dispute. But the Abbots of Westminster relied on the charter of Eadgar when they claimed jurisdiction over the district which extended to Ludgate Hill on one side, and may be said to have been bounded by Holborn and Oxford Street on the north, and on the west by a line drawn from Bond Street to the spot where Buckingham Palace now stands, and thence southwards to the Thames, near Vauxhall Bridge and Grosvenor Road. Mr. Loftie, who has given attention to the subject when writing of early Westminster, says:—

> The great manor of St. Peter formed after the time of the Confessor the parish of St. Margaret. It extended eastward from Milbank to the Fleet, and northward from the Thames to the ancient highway which we know as Oxford Street. Notwithstanding the size of this immense district, which comprises now the site of the largest and most populous city in the world, its value must have been but small, and until the twelfth century, at least, the greater part of it lay empty and open. At that time the bishop's estate at Stepney, and the canon's estate in Shoreditch, were already being rapidly colonised and but little of the modern Westminster had permanently emerged from the Thames. The date of the foundation of the Abbey is involved in doubt, as is that of the grant of the land adjoining it. A very early but, it is nearly certain, a forged document is quoted by all the authorities defining the boundaries in 951 under Eadgar. But the difficulties in the way of its acceptance as contemporary evidence are insuperable; and, so far, I have not found any unquestionable evidence that Westminster Abbey was in existence before the Danish conquest. The comparative unimportance of its estate, the boundaries of which were certainly doubtful as late as 1222; the remoteness of its other Middlesex manors, and the evident difficulties which Edward the Confessor encountered in obtaining for it an adequate endowment, as may be seen in the number and tone of the charters, genuine or fictitious, which were produced by the Abbey at the time of the refoundation by Henry III., as well as the protracted, but historically instructive, controversies with the neighbouring city of London to which they led, are almost sufficient in themselves to prove that St. Paul's is far older as an endowed foundation; and this view is partially confirmed by the name of the West Minster, which goes to show that before the Abbey was generally known among the people, another minster was in existence to the eastward. The early history of the royal abbey has still to be unravelled. The absence of any local name, unless that of Thorney be accepted, the existence of a king's house, the recent discovery of Roman remains in the church—these and many other points, which seem to be incompatible with any of the received theories, must be cleared up before we know as much about the origin and growth of Westminster as we do even about the origin and growth of St. Paul's.

The year 1222, which is referred to by Mr. Loftie, has some importance, because then the long suit between the monks of the Abbey and the Bishop of London, respecting the freedom of the former from the episcopal control, came to an end. According to Widmore, "the precinct of the Abbey and the whole parish of St. Margaret, at that time larger than at present, were declared exempt from the bishops of London and made a peculiar jurisdiction." It was necessary to fix the boundaries of the exempted region. On the western side, where the ground was of no importance, the boundary that was supposed to be described in Eadgar's charter as running through Bulinga Fen or Tothill Fields to Cowford, was allowed to remain. The northern boundary was also admitted in part, but instead of continuing along Holborn to Farringdon Street, it stopped at the garden of St. Giles's Hospital or the end of High Street. On the eastern side the boundary crossed Soho, went north of Long Acre, thence through part of Drury Lane to the Strand, exempting the Savoy district. The Strand churches would appear to be associated with the Abbey, for in a deed of 1393 the Abbot is described as being seized of "the manor of Westminster in the town of Westminster and in the parish of St. Martin-in-the-Fields, the Blessed Mary of the Strand and St. Clement Danes, without and near to Temple Bar." The history of the Strand parishes is, however, no less obscure than that of the Abbey. It is supposed that originally St. Mary-le-Strand and the church in the Precinct of the Savoy formed part of the parish of St. Clement Danes. That the parish belonged to Westminster seems to be evident from the circumstance that William the Conqueror insisted upon its restoration to the Abbey after it had been unjustly seized by one of his officers. But in the reign of Henry II. it was made over to the Templars, and probably was not then part of the abbatial estate.

The second Richard was not the last monarch who was obliged to consider the limits of Westminster. In 1604 James I. granted letters patent, by which it was extended, and practically became the district which has been known of late as Westminster. A large addition was made on the western side by which the sites of Mayfair and Belgravia were taken in, as well as Hyde Park and Kensington Gardens, with part of Brompton. Perhaps it would be more correct to say that in 1604 an outer district, which was always attached to the Abbey, was made to have more of a metropolitan character. The decree of 1222 mentioned certain lands "beyond these beforementioned bounds, the districts of Knightsbridge, Westburne, Padynton, with its chapel and their appurtenances," which belonged to the parish of St. Margaret.

A great part of this land belonged to the Manor of Eia, which, according to Domesday, was held by Geoffrey de Mandeville, who took part in the battle of Hastings. He was buried in the cloisters of Westminster Abbey, and bequeathed his manor to the monks. It was afterwards divided into three smaller manors, called Neyte, Eubery and Hyde. Attached to Neyte was a manor-house, and, by permission of the Abbot of Westminster, it was occupied about 1386 by the Duke of Lancaster. The manor of Hyde was enclosed as "a park, walled and environed by brick and stone," by Henry VIII. about 1536. Eubery is commemorated by Ebury Street in Pimlico.

In the course of the changes, the parish of St. Martin's-in-the-Fields was enlarged at the expense of the old parish of St. Margaret's. It is remarkable, however, that the division between them was not defined until the reign of Henry VIII. He defined St. Margaret's as the scene of the abbots' jurisdiction, while in St. Martin's were their properties. In 1535 it was decreed that the inhabitants dwelling from the new gate should henceforth consider themselves as parishioners of St. Martin's. According to Sir Christopher Wren, the new gate was one in King Street, which was very near the Abbey.

THE RIVER, FROM THE CUSTOM HOUSE TO RICHMOND; OR, A CHAT ABOUT SOME BRIDGES.—II.

[By a Correspondent.]

IT may be worth mentioning, in connection with Westminster Bridge, that the writer well remembers being conducted over it by its clever designer, the late Mr. Page, C.E., before the superstructure was finished. There were small, thin iron plates, hollowed out on the under side, and above them pieces of cork, over which something of a bituminous nature was poured, as the foundation, so to

speak, for the roadway. This excited the astonishment, not only of the writer, but of an eminent architect, since gone to his long rest, who was present on the occasion. It was not the only novelty, as the paving for the foot-passengers was formed of large cream-coloured terra-cotta tiles laid diamond-wise. The substratum of the road has proved lasting, but the terra-cotta, though agreeable-looking and pleasant to walk upon, wore out into numerous hollows owing to the enormous traffic, and so was superseded by asphalte.

In continuation of the voyage up the river, and leaving Westminster Bridge behind, one comes to that very economically-constructed suspension bridge nearly opposite Lambeth Palace, which had lately to be strengthened in view of the increasing traffic on it, such as was not contemplated when it was built. To call this bridge elegant would be absurd, and the writer has often heard it termed ugly. At the same time, it honestly fulfils its purpose, and is not overlaid with superfluous ornamentation, like the railway viaduct at Ludgate Hill, which, for the purpose of comparison, except for its lesser span, may be likened to the bridges over the Thames. One of the disadvantages of this Lambeth example is that, owing to the level of the approaches, its springing is low, which is noticed on the Albert Embankment side particularly, where the footpath has to be dropped in order to secure headway under the bridge. This certainly destroys the dignity of the structure, and makes the thoughtless passenger murmur, "This is cheap and nasty!". Now the writer, following out the opinions expressed at the commencement of this article, maintains that this bridge fulfils all the true principles of architecture, and only falls a little short of the beautiful. The balustrading is just what it should be to suit the material, a kind of latticework with no affectation about it, for most of the Thames iron bridges are a failure in this respect. The suspension-rods from the chains come in naturally, and the cantilevers to support the footpaths are of the simplest description. In fact, one may say, not a penny has been spent on decorative work. It is in the upper part of the piers where the want of a little relief is felt, for it must be acknowledged they are remarkably plain. Beneath the roadway, as in several of the suspension bridges, there are two cylinders, placed transversely, of course.

Vauxhall Bridge is plain enough and not beautiful. But it has the merit of fulfilling its purpose, and all its details are treated in a straightforward way, simple as they are. The niches in the massive granite piers, against which the arched iron construction abuts so comfortably, would look all the better were they filled with figures. But, then, everyone who knows anything about our public buildings in London is well aware that "the exception proves the rule" in this matter, though there is one very notable instance to the contrary, for, wonderful to relate, the Burlington Street façade of the University of London was actually supplied with all its statuary at the time it was erected. The writer made a mental note of it then on account of the singularity of the occurrence; *vide* the contrary at the Foreign Office and St. Mary-le-Strand, not to mention numerous other tenantless receptacles for sculpture in our great city. The balustrade, as is the case with nearly all these iron bridges, is rather a failure, and looks too high to be in good proportion, besides being very formal. It is certainly much easier to treat a masonry parapet successfully, whether solid or perforated, than one of iron, as is apparent by what has been said. It is but "telling a twice-told tale" to say that the newer bridges lose some of their effect by the rise of the roadway in the centre being so slight. At Vauxhall there is a good bold arched outline which horses do not like, but many human beings do. The perforated spandrils have vertically-arranged pierced panels, semicircular headed.

The railway, or Victoria Bridge, at the eastern end of Battersea Park, has been previously alluded to. It is an excellent specimen of design, though so plain, the spandrils of arched iron construction having perforated latticework very like the other iron bridges.

The Albert Suspension Bridge, though near, is fortunately sufficiently far away from the example just mentioned to enable the spectator to judge of its merits without finding its neighbour too much diverting one's attention. There is originality and elegance in this Albert Bridge, but it is a pity the ornament is not of a purer or more pronounced character. A good deal of the popular freely-treated Renaissance ornament is not quite acceptable to the writer, possibly because he is too old-fashioned to move with the times; but, at any rate, there is a distinction between meaningless decoration and that which appeals successfully to the educated eye. There is much to examine in this structure, specially in the piers, or series of piers, which cannot be described by one stroke of the pen. The planning is really good, and the engineers have struck out a line of their own in regard to these features. Instead of one continuous pier, transversely, there are two, with a bold arch connecting the one with the other. It seems to the writer that it is in the turrets or piers of these Thames suspension bridges where iron, speaking from an architectural point of view, fails. In the old Hungerford Bridge there were towers of masonry, not very massive in construction, but sufficient to carry the great weight of the chains. In iron, whether cast or wrought, it is extremely difficult to treat these important features in a satisfactory manner, and the writer can feel for civil engineers therein. Iron, at any rate for the sub-aqueous foundations, does not take up so much room as brickwork or masonry, which is a constructional advantage. The projections on a circular plan in front of the piers add much to the picturesque effect, and the simple iron latticework to the parapet of the bridge is on the right principle. It acts as a foil to the rich ornamental work in the rest of the bridge, which would have been overdone had much decoration been applied there. The suspension-rods from the great chains are vertical, which has a better appearance than the way in which they are disposed in the Battersea Bridge. The picturesquely-treated pair of lodges at each approach to the bridge add much to its dignity. Taking it altogether, this is a noble and elegant structure, displaying considerable novelty in its design, every detail having been well thought out. It is certainly one of the handsomest bridges on the Thames.

The Battersea Suspension Bridge is a great contrast in many ways to the example just commented upon. There is, in fact, hardly a point in common between the two. For instance, the lofty iron piers are of much more slender proportions and placed outside the roadway, and are also disconnected beneath. The roadway is really almost independent of the piers as a matter of design, it only resting on them sufficiently for constructional purposes. There is much ingenuity in the manner in which these piers are broken up on plan by clusters of pillar-like features. But though no doubt superabundant in point of strength, they have a rather flimsy effect. That is one of the disadvantages of the material, and it would be absurd to go to the great extra expense of more substance merely for appearance. The central span of this bridge is very considerable, the side spans being less as compared with other structures on the suspension principle. But what distinguishes this bridge so much from all others is the employment of braces set diagonally at different angles from the chains down to the balustrade, in addition to the ordinary suspension-rods. These, of course, are in a different plane to the latter, and secured by ornamental bolt-heads outside the roadway balustrade, which is quite plain and unperforated, consequently looking somewhat heavy. Constructionally this is decidedly a very interesting bridge to examine, but from an artistic point of view the braces at various inclinations have a confusing appearance in perspective, and are puzzling until a closer inspection solves the mystery of their planning.

The new Chelsea Bridge has an effective rise in the centre, but the harsh contrast between the grey granite and the iron arches painted green is not pleasing. However, the paint part can easily be altered if necessary, for paint, like beauty is reported to be, "is but skin deep." What strikes the spectator a little way off, and is difficult at first to realise, is the presence of a large *cavetto* moulding, slightly ornamented in low relief, on the face of the iron-arched construction next the soffite. It might, in other words, be called a cove, but then no one expects that in such a position, which misleads the traveller somewhat. The writer does not know any such feature in other bridges, and cannot say that he considers it quite successful. The management of the spandrils to this bridge is also unlike the others where iron is employed, for in the

Chelsea Bridge there are no perforations, but, instead, some non-geometrical ornamentation in relief. There can be no question that this is by no means so effective as the plain lattice-like piercing, and looks dull and heavy. The parapet to the bridge is perforated—an arcade of semicircular character carried on shafts. For some reason or other the raking lines of the piers, where there are mouldings, disturb the eye in this example, though in other bridges the same thing occurs, as was remarked upon in No. I. of this article. However, as a whole, this is a handsome substantial-looking structure.

Pursuing one's course up the river, the next bridge arrived at belongs to the South-Western Railway, between the Chelsea and Battersea Stations. It is of much the same type as the Victoria Railway Bridge, having been built before the more recent and very ugly lattice-girder kind, carried on iron cylinders, came into use. This bridge has plain perforated spandrils and a balustrade of simple lattice-work description. It is, in a word, commonplace; but having nothing about it to offend the eye or form a blot on a fair landscape, as unfortunately is the case with the prevalent type of railway viaduct or bridge. For example, the two next bridges further up stream, though superior specimens of their class, the first one a road bridge, the next for the steam-horse, do not possess the charm of the massive structure a little beyond. But it is better not to anticipate. Wandsworth Bridge might easily be mistaken for a railway-bridge, owing to its general construction, were it not for the considerable rise in the centre. It cannot be called beautiful, for it is too utilitarian looking, and great lattice girders resting upon cylinders, even though the latter be covered with handsome capitals, will never compensate for the absence of the arch. It is true that in the case of suspension bridges the under arch is missing, but then there is the graceful contour of the chains, the concave line at the top next the sky, instead of the convex underneath the roadway. The writer, when first he visited Rome some years since, was amazed at the grand effect of the long series of columns in some of the early basilican churches, carrying no arches, but with flat lintel construction over them. The secret of this was in the fact that the piers were very close together, whereas where iron is employed the supports can be very much farther apart, which results in that stiff, square appearance. The attempt to get over this by elaborate brackets, as at the Ludgate Hill railway viaduct, is a failure, artistically speaking, because such seem out of place in the construction. On the Metropolitan Railway Extension, between Rickmansworth and Chesham, how much the picturesque scenery is marred by the terribly ugly viaducts over the old country roads, where, in many cases, the abutments are coated with Portland cement which carry iron girders! How one sighs for the ancient arch, whether of the commonest brick or rough local stone! This seems a rather long digression from the bridges over the Thames, but the same principle applies necessarily, to some extent, on *terra firma* as on the running waters.

(*To be continued.*)

A FRENCH VIEW OF ART IN ENGLAND.

A REPORT has been prepared by M. O. Fedière, for a long time attached to the Luxembourg Museum, who was recently despatched by the French Minister of Public Instruction to make a study of the question of Government aid to art in Great Britain.

It is difficult, if not impossible, he says, to establish a parallel between the English and French systems of encouraging the fine arts by means of national aid. The French system, established immediately after the Revolution, possesses a homogeneity and freedom vainly sought for in England, where the fine arts are subjected to the restrictions of certain traditions, some of which are obsolete, being indeed of Mediæval origin. Furthermore, whereas in France the State claims all the institutions, the English Government abandons willingly everything that might be left to private enterprise. Consequently, in England there exists no minister of fine arts, nor a minister of public instruction, properly so called. This does not mean however, that the English Government takes no interest in these institutions; but, on the contrary, art and education are the objects of special solicitude, and their fostering gives employment to a large number of persons. In order to control in a measure the development of the fine arts, since there is no special ministerial department, the plan of placing them under the control of a private committee is adopted. In this way there exists a committee forming a court of appeal called "The Judicial Committee of the Privy Council," another of commerce styled "Board of Trade," and finally a committee which presides over education and the fine arts, to which the name of "Committee of Council on Education" is given. The head of these committees is officially the president, but the real head is the vice-president of the council. All questions relating to education and the fine arts are referred to him. He is assisted by a central administration, sitting permanently in London. This administration is subdivided into two great sections or departments, of which one presides over education and the other over sciences and arts. This latter is called "The Science and Art Department." This Department has under its direction the elementary schools of sciences and art, the mining and geological schools, the South Kensington Museum, and certain other establishments which owe their existence to the Government. But the British Museum and the National Gallery enjoy a certain autonomy, and are controlled by special committees.

The *rôle* of the Government in respect to these institutions is limited to grants of money, which, however, are very insufficient. The expenses provided for by the budget of 1890–91 amount to 474,896*l.*, distributed as follows:—

Central administration	£29,059
Salary of professors of sciences	113,072
Salary of professors of arts	47,432
Expenses common to both Departments ...	60,907
Grants to students	58,912
Grants to museums	86,714
Grants to schools of science and art	78,800
Total	474,896

In this sum the amounts allotted to the British Museum and the National Gallery are not included, as well as to some other independent institutions, and consequently these subsidies may be added:—

British Museum...	£155,145
National Gallery	14,594
Gallery of National Portraits	2,209
Grant to Royal Academy of Music	500
Grant to Irish Academy	500
Total	172,948

The head of the department is an officer who bears the title of secretary, and whose salary amounts to 1,500*l.* a year. The director of the arts division has 925*l.*, while there are forty-four clerks receiving salaries amounting in the aggregate to 8,186*l.* This Department regulates questions relative to (1) the teaching of fine arts (schools of fine arts, Roman school (!), school of design, &c.); (2) exhibition manufactories, purchase of pictures for the National Gallery, grants to theatres, &c.; (3) museums and historical monuments.

Schools of Fine Arts.

The State, except in the case of primary artistic education, leaves to private initiative the care of forming painters, sculptors and musicians, and the only school is that of the Royal Academy, which is a private society. The State gives no grants to theatres, nor does it organise any artistic exhibitions; but the importance of those undertaken by private societies each year has been such as to deserve the term of national institutions, the principal of which are the Royal Academy Exhibition, the Royal Society of Water-Colours, the Institute of Water-Colours, the British Society of Arts. Each of these societies has two exhibitions yearly—one in winter, the other in summer. The society bears the expenses of its own exhibitions, and receives a percentage on every picture sold. Besides these societies, there are commercial societies which organise with a good deal of success annual exhibitions, such as the Grosvenor Gallery and the New Gallery. Both of these societies have rendered good services to art in allowing artists of slight fame to expose their works. None of these exhibitions give prizes, and the State does not buy the productions of living artists. The Royal Academy possesses a fund for the purchase of modern pictures. This fund was placed at its disposal by the celebrated sculptor Chantrey, who in dying decided that his fortune, exceeding 100,000*l.*, should go to the Academy after the decease of his widow, in order to buy each year a picture from an English or foreign artist, provided that the said picture was executed in England.

Preservation of Works of Art.

In the case of museums England need not be jealous of other countries. The National Gallery, the British Museum and the South Kensington Museum are too well known to require any comment of praise.

The British Museum.—The British Museum dates from the second half of the last century. About that time a doctor, Sir Hans Sloane, lived in London, and at his death he bequeathed to the State a rare collection of books, curiosities of a varied

nature, and a whole roomful of natural history. He died in 1753, and the State accepted the gift, and Parliament passed an Act authorising the acquisition of this collection, as well as that of manuscripts formed by Robert Halley, and the library of Sir John Cotton. A national collection was thus at once formed, but a place to put it in was required. A second time Parliament was appealed to, with the result that a lottery was organised to defray the expenses of the site of the present Museum. From this moment gifts flowed in and legacies were left, so that in 1843 the Museum had to be enlarged to its present proportions. The British Museum is divided into the following departments :—(1) Books, (2) plans and charts, (3) manuscripts, (4) Oriental manuscripts, (5) designs and impressions, (6) Egyptian and Assyrian antiquities, (7) Roman and Grecian antiquities, (8) British and Middle Age antiquities, (9) coin, medals and natural history. The Museum is administered by a committee of fifty trustees, of whom one is appointed by the Queen.

Royal Academy of Arts.—The Royal Academy was founded within the reign of George III. in 1768. In the month of November of that year a number of artists addressed a petition to the king, asking his support for the creation of an institution to encourage art and design. A month later the king approved the petition by founding the Royal Academy, which from that time has been administered with increasing success. Its aim is to give gratuitously tuition in painting, design and architecture, and to organise an annual exhibition in London. Its revenue is derived solely from these exhibitions, which are much patronised by the public. The society is composed of forty academicians, who elect amongst themselves each year a committee of ten for the control of the institution. Each member must, within six months after his election, present to the Academy one of his productions. The members form the jury for the admission or refusal of works to their exhibitions and distribute no prizes. The only privilege which the exhibitor enjoys is that of free entry to the exhibition and to the lectures at the school. For the public the admission is one shilling.

The School of Art of the Royal Academy.—For the teaching of the fine arts properly called, there is in England but one school, that of the Royal Academy. This school was founded in 1768, and has a class for the study of antique models, a preliminary class of painting, a high class of painting, a class for the study of the nude, a class of sculpture from living models and a class of architecture. An art library is open to students, and each year a course of lectures is given by competent professors. During the first three years of study the students are obliged to follow these lectures. Before being admitted to the school the candidate must furnish a specimen of his capabilities. The instruction given in the classes is absolutely gratuitous, the students being only asked to furnish what instruments they require.

The National Gallery.—The National Gallery was founded in 1824. In that year the Government bought, for the sum of 57,000*l.*, the collection of a rich banker, consisting of thirty-eight pictures by the old masters. This was the beginning of the superb museum so much valued to-day. Two years later Sir G. Beaumont presented to the Gallery fifteen pictures of great value. The example was rapidly followed by others, and soon funds were voted by the Government for the purchase of paintings, and, when these funds were insufficient, private persons came to the relief of the Gallery. It was thus that a picture costing 55,000*l.* desired for the Gallery was obtained when the Government refused to offer more than 24,000*l.* Three gentlemen promptly gave 10,000*l.* each and the treasure was secured. The National Gallery was at first situated in Pall Mall, but in 1828 the present building was constructed at a cost of 200,000*l.* in Trafalgar Square. The control of the Gallery is in the hands of six trustees, who have under them a director with a salary of 1,000*l.* a year, a secretary paid 875*l.*, and a staff of thirty-six curators and employés of different ranks.

The National Portrait Gallery.—This collection, which is installed in Bethnal Green, owes its origin to Lord Stanhope, who conceived the idea of assembling in one place the authentic portraits of the most distinguished persons of the century. Sovereigns, statesmen, generals, men of letters and artists figure in this Gallery. The number of portraits exceeds 880, of which more than half were presented by private persons.

The South Kensington Museum.—This museum is one of the largest in the world. It is well organised and lends out to provincial schools many subjects of natural history or works of art.

Theatres and Singing Schools.—No theatre in the United Kingdom receives a grant from the State, nor is there any conservatory of music. However, the Royal Academy of Music replaces advantageously a conservatory. It receives an annual grant from the Queen of 500*l.* Students are required to pay 30*l.* for the session of nine months. Such is the information I was able to procure in prosecuting my inquiries, and by it may be seen that the English employés are much better paid than our own (French). The salaries for corresponding service are from 75 to 100 per cent. higher in England than in France. I find, also, that the English Government is powerfully seconded in its efforts by private subscriptions. It is to this latter source that England owes the most of its institutions of art, and it is to it that the country has recourse when a pecuniary effort is necessary. Another fact to be observed is that the administration of fine arts in England centres all its efforts in preserving works of art, paying but a secondary attention to education. England gives facility to the art student to acquire the first notions of the subject, multiplies the models in the museums destined to form his tastes, but proceeds no further. The artist is obliged to shift for himself without the hope of receiving any decoration or pecuniary encouragement, which is the reverse of the system that obtains in France.

SILCHESTER.

THE letter of Mr. W. J. St. John Hope, which appeared last week, deserves to be compared with the following speculation by the late A. J. Kempe, as to whether Silchester was the Calleva Attrebatum or the Vindonum of the Romans. He wrote :—

Until the publication of Horsley's lucid commentary on the Roman itineraries of Britain, Silchester, on the authority of Camden, had been considered the ancient Vindonum, or Vindomis ; and that station, the capital of a colony settled in Britain before its invasion by Cæsar, bearing the name of Segontiaci, who surrendered to him on his second expedition. Horsley saw reason to differ from Camden in assigning the locality of Vindonum, and placed it at Farnham (whether rightly or not is not the particular object of these remarks) ; Calleva at Silchester. Mention of this station, Calleva Attrebatum, occurs in no less than five of the Iters of Antoninus. I recapitulate the stages of the Iter, of which Silchester was one, following Horsley's appropriations for them, on the modern map.

A Regno Londinium—from Chichester to London—96 miles ; Clausentum (Old Southampton), 20 miles ; Ventam Belgarum (Winchester), 10 miles ; Callevam Attrebatum (Silchester), 22 miles ; Pontes (Old Windsor), 22 miles ; Londinium (London), 22 miles. The station Pontes, which Horsley places at Old Windsor, and for which so many different places have been assigned by the learned in Roman topography, must have been where the Roman road from London crossed the Thames at Staines. From Pontes the Roman agger pursues its course through various now unfrequented localities, to the east gate of the station at Silchester, passing in its course through the demesne of the Duke of Wellington, where it gives name to the two adjacent parochial districts, Strat-field Say and Strat-field Turges ; but the line of road presents no place for the chief city of the Attrebates until it arrives at the walls of Silchester. Is this, then, really the Calleva Attrebatum? The distance between Pontes and Calleva, according to the Itinerary, is 22 miles ; by a Survey, the distance between Staines and Silchester is 26 ; a conformity as near as can be required, for neither the length of the Roman mile nor the mode of measuring it agreed precisely with ours.

Five times, I have said, is Calleva mentioned in the Itinerary as traversed by the Roman line of march from various directions ; not less than four Roman roads are traceable from it at this day. But the strongest proof that it was really the ancient Calleva may, after all, be found in the circumstance that some traces of its former name are preserved in the present. Like many other ancient cities of Britain, Silchester was known by various appellations. We shall see if any of these had an identity of origin. Nennius, in his "Catalogue of British Cities," calls it Caer Segont ; perhaps merely with reference to the inhabitants of the district in which it was placed. This distinction was probably merged in the Itinerary, in its connection with the more important province of the Attrebates, on whose confines it immediately stood. Nennius tells us it was also called Murimintum, an appellation which we must consider had allusion to its wall, which, even to this day, is so strikingly characteristic of its site. The term Galleva, or Calleva, of the Roman itineraries, appears to have had the same source, and was but a softened form of the British Gual Vawr, or the Great Wall ; both names had their root, perhaps, in the Greek χάλιξ (silex), whence also the French *caillon* (a pebble). Sile-chester, or Silchester, is therefore but a Saxonising, to use the term, of Silicis Castrum, the fortress of the Flint or Wall, by the easy metonymy which I have shown. The Greek lexicographer says that χάλικες are the small stones of which buildings are constructed, "ut sunt silices," "et cementa," and cites Thucydides for authority.

Nennius ascribes the foundation of Silchester to Constantius, the son of Constantine the Great. Whatever improvements he might have made in its buildings or defences, I cannot but think it had a much earlier origin. As the chief fastness or forest stronghold of the Segontiaci, it probably existed at the time of Cæsar's expedition into Britain. The anonymous geographer

of Ravenna gives it a name which I have not yet noticed, Ard-oneon; this is a pure British compound, and may be read Ardal Onion, the region of Einion or Onion. Now it happens, by the circumstantial tenacity of tradition, that an arch or cavern in the massive walls of Silchester is called to this day Onion's Hole, and Camden bears testimony that, in his time, the numerous coins found within its limits were called Onion's pennies. These coins are chiefly, I believe, of the Lower Empire, and attest the large population of the place at that period. I cannot, however, with the venerable and judicious Camden, esteem the tradition concerning the Giant Onion altogether as a dream; doubtless he was some great chieftain of the Segontian weald, the lord of Silchester before its silicious rampire was raised, when its defences were constructed of earth and the felled trees of the surrounding woods. The form of the station shows that its original ground-plot was not Roman. Einion may, therefore, be compared to one of those beings of primeval times whom the Scripture terms "giants," a race of more bodily power than man possesses in his civilised condition, for in savage life the corporeal energies are more fully developed, to which we may add that the hardihood, temperance and exercise which must be practised in a life so destitute of luxurious indulgence induce, of necessity, no small degree of natural prowess. Thus personal strength was, in the heroic ages, a highly honourable quality.

The inscription found at Silchester in 1732, by which one Tammonius dedicated an altar to the Segontian Hercules, has confirmed the account of Nennius that it was the city of that tribe. Another, discovered at the place about the same period, shows, however, that it might claim a much earlier period of occupation by the Romans than that assigned by the above writer. This last inscription was in compliment to Julia Domna, as patroness of the Roman army and senate. She was a Syrian by birth, and second wife of the Emperor Septimius Severus.

When I visited Silchester many years since I saw at the farmhouse, just within the eastern gate, a gold coin of Domitian in the highest preservation, a bronze key-ring and other relics of the Roman age. In the yard lay some fragments of stone columns of considerable size. With these articles may be enumerated some penates of bronze and a gold ring bearing these letters :—

SE | NI | CIA | NE | VI | VA | S | II | NDE.

Of this, by comparison with a ring (an impression of which has been shown me by my friend Mr. Nichols) found at Brancaster, Norfolk, I am able to correct a former suggestion of mine and to read, I believe, the inscription rightly. The relic was, I consider, a sort of *annulus Amicitiæ*, the gift of some Christian of the Roman times to his friend Senecianus; the legend a pious aspiration, "Seneciane, vivas in Deo." In the ring was set an antique intaglio of Venus Urania; this addition was merely ornamental.

In no spot in Britain exists more striking evidence of the devastation effected by the northern barbarians on the Romano-British colonies than in the deserted area once occupied by the Segontian city. The site is left as bare and houseless as Anderida, which the fierce Ella rased to the ground in the fifth century, about which time Silchester probably underwent the same fate. The tradition of the neighbouring cottagers is that it was destroyed by wildfire attached by the besiegers to the tails of sparrows, a figure, perhaps, truly recording the main catastrophe and the fact that it underwent an assault by igneous missiles. A deep mystery, however, pervades the story of the rise and fall of Silchester.

The stupendous walls of Silchester, chiefly built of flint pebbles, have alone, of all its buildings, defied the exterminating ruin, and remain to this hour silent witnesses of the city's ancient grandeur. The soil accumulated on their surface nourishes many lofty forest oaks, singular and interesting appendages of the indestructible flinty rampire.

It may be recollected that in 1833 the remains of some magnificent baths were discovered at Silchester. Of this circumstance I sent at the time some account to the *Gentleman's Magazine*, to which communication incidental reference has occasionally in the course of discussions been made. From the same source I beg to detail one remarkable fact :—The baths at Silchester bore a corresponding similarity of arrangement with that of the ancient baths in the island of Lipari, so interestingly described by Captain Smyth. "In the *natatio*, or cold-water bath, at Silchester was found a human skeleton, and in the leaden pipe connected with the bath upwards of 200 Roman coins of brass."

The tesselated floors of the Silcestrian Thermæ were thickly strewed with wood ashes and the fragments of tiles that had formed the roof, appearances which I have noted in almost all remains of Roman edifices or villas discovered in Britain. I need not remind the antiquary how frequently charred corn is found in Roman buildings. These circumstances clearly indicate the destruction of public and private dwellings, granaries, &c., by violence and fire.

TESSERÆ.

Paintings in Churches.

In the fourteenth and fifteenth centuries painting was the ally of faith and almost on equal terms with theology. It was the embodiment, in outward symbols and in popular forms, of mysteries in their own nature abstract and incorporeal. It rendered intelligible and pathetic those touching passages from the divine history which otherwise were shut up in the Latin of the Vulgate, and made them speak to all hearts through the universally intelligible language of the eye. It had its birth in enthusiastic feeling, for few then consecrated themselves to the service of art except from a deep inward prompting and natural call to that vocation, and it generated and kept awake that enthusiastic feeling in others. It was a part of that redeeming principle of earnest faith which spread its influence, in one shape or other, over the whole course of action of the time, deep and genuine, when it existed at all, and certainly then existing in the mass of the community, though obscured and perverted; that faith which founded altars, endowed churches, gave birth to pilgrimages and penances, dictated crusades and made the whole of Christendom bend in submission before the footstool of some feeble old man as the successor of St. Peter. As the handmaid of religion, nay, as part of religion itself, painting had then a principle of existence apart from the patronage which is bestowed upon it as an instrument of luxurious ornament, or as ministering to the refined pleasures of taste. Patronage, indeed, and reward followed in its train, for under reward must be viewed not mere wealth but station in society, rank, influence, and thus the lower ambition and more vulgar cravings of artists were gratified, as well as the nobler; but the masterpieces of early art, those on which all ages have since recognised the stamp of the highest genius, had their birth in that lofty character with which painting was then invested; rendering it something of a priesthood as well as a profession, excluding the mediocrity which arises as soon as mechanical dexterity comes to be the substitute for feeling, making the artist feel his immediate influence over the public mind, and, like an actor on the stage, derive new excitement and enthusiasm from the consciousness of his power. But not merely was painting, as an instrument in the hands of religion, the means of exciting the sensibilities and elevating the mind to the conception of divinity; it was actually, in the earlier ages, a means of national education. It positively enlarged the boundaries of knowledge before the general diffusion of books by printing; it was the substitute, first for the drama, and next for books. As Lord Chatham confessed that he derived most of his acquaintance with the history of England from Shakespeare's plays, so the chief information connected with history which the people possessed during the golden era of Catholic art was derived from pictures. In them, also, as in the scenes of the drama, they could study the living play of human passions, and even where they did not communicate positive ideas, they yet exercised, by means of fancy and the excitement of the sense of beauty, an indirect influence upon the understanding; valuable, because its effect, so far as it went, was not partial but universal. In this way painting became not merely an ornamental but a useful art, a practical power in the State, to be cultivated and set in motion through the establishment of guilds and societies, as we now found schools and universities. The artist felt himself, and was felt to be, important to society as furnishing the necessaries of the mind, in the same way as the other members of those guilds and crafts did the necessaries of the body. This state of society has passed away, and we can no more expect to see the revival of painting, as it then existed, than we could hope to rebuild the ruins which time has overthrown, and call back, amidst modern civilisation, with its accompanying benefits and evils, the institutions of the fifteenth century.

Mediæval Bell-Founding.

In a "Life of Charlemagne" it is stated that in the abbey of St. Gall a monk, who greatly excelled in the art, produced a specimen of his craft, the tone of which was much admired by the Emperor. "My lord-emperor," said the monk upon this, "command a great quantity of copper to be brought to me which I will purify by fire, and let me have silver instead of tin, about a hundred pounds, and I will cast for you such a bell that the other in comparison with it shall be mute." Magius lamented that princes were more avaricious than formerly, and would no longer bestow the necessary coin to impart a silvery sound to the bells. Mr. Gatty, however, says that the widespread notion of the advantage of this ingredient is a complete mistake. "Persons," he says, "talk as familiarly of sweetening the tone of bell-metal by the introduction of a little silver as they would speak of sweetening a cup of tea or a glass of negus with a lump of sugar. This is a dream. Silver, if introduced in any large quantity, would injure the sound, being in its nature more like lead as compared with copper, and therefore incapable of producing the hard, brittle, dense and vibratory amalgam called bell-metal. There are, no question, various

little ingredients which the skilful founder employs to improve his composition, but these are the secrets of the craft and peculiar to every separate foundry." Nor is there any valid reason for supposing that our ancestors employed it any more than ourselves, except that it was a custom to cast a few tributary coins into the furnace. The composition of the amalgam in England six hundred years ago is known to us from the materials delivered in the thirty-sixth year of Henry III. for the purpose of making three bells for the church in Dover Castle, when all that was furnished was an old bell, 1,050 pounds of copper and 500 pounds of tin. The mixture was therefore made up of rather more than two parts of copper to one of tin; the modern recipe only differs from the ancient in allowing three parts of copper. The vaunted superiority of a few of the older bells over those of recent times has been ascribed by some to the influence of the atmosphere in the course of centuries; others have suggested that it was due to melting the metal by a fire of wood, which is known to improve the quality of iron, instead of by the rapid process of a blast furnace. But there is another cause which has had its share in the effect. "If the quantity of metal," says Mr. Gatty, "be not in due proportion to the calibre of the bell, the power of its tone will be lost, and only a panny, harsh, iron-like sound can be produced from it. For instance, if you try to get the note E out of a quantity of metal which is only adapted to sustain F well, the F in that case would be preferable to the E intended." Now in old bells a far larger mass of metal was allowed to a given note than is the case with us, for modern skill is necessarily directed as much to economy as excellence of manufacture. The tenor bell of Rochester Cathedral weighs 28 cwt., but its note F would be reached at present with half the metal, at an equivalent sacrifice of dignity of tone. In science and dexterity the living artificers surpass those of bygone times. By the early part of the fourteenth century a distinct class of workmen followed the trade, and the bell of Crokesden Abbey, in Staffordshire, having been fractured in 1313, Master Henry Michel, of Lichfield, was engaged with his assistants in recasting it from the Octave of the Trinity to the Feast of the Nativity of the Blessed Virgin. Notwithstanding the time bestowed upon the process, it turned out a failure, and being recommenced anew it took two months more to bring the work to a happy conclusion.

St. Mary's Abbey, York.

Little is known of the early history of this abbey. That there was a monastery on this site during the time of the Saxons appears certain; but, as the Danes repeatedly destroyed the northern monasteries, the one of St. Mary's probably shared the same fate, and the only remains that can, with any probability, have been of that period are the rough foundations of the east end of a very small church, situated where the east aisle of the south transept of the last church stood. Taking the epochs of the rebuilding of the different parts of the monastery from the remains, they will be found to divide themselves into five distinct periods, viz.:—(1) Saxon, of which the only remains are the foundations of the east end of the church, as above stated. (2) Norman, when the monastery was entirely rebuilt by Stephen, called the first abbot, under the auspices of William Rufus, who himself laid the first stone, about the year 1100. The remains are—the great gateway from Marygate, the vestibule to the chapter-house, the misericorde, the cellarer's office, the school of the monks, and the rough foundations of the north-east part of the east end of the church. (3) Early English, when the church and chapter-house were entirely rebuilt by Simon de Warwick, abbot from 1250 to 1290. The remains are part of the west front of the church, and the outer wall of the north aisle of the nave, with parts of the walls of the transept, boundary walls and foundations of the choir and chapter-house. (4) Later Gothic, about the year 1450, when the principal part of the edifice seems to have been rebuilt. The remains of this period are chiefly the school and ambulatories of the novices and of the monks, the parlour, the kitchen and its dependencies, the porter's cell, guests' hall, and a great portion of the walls and towers, and a gateway to the abbot's palace. (5) Works that appear to have been going on at the time of the dissolution, the remains of which are the water gate, porter's cell and room over.

Interior Decoration.

The entablature, as usually composed, is essentially a piece of external architecture. The frieze occupies the place of and represents the ends of the horizontal cross timbers of the roof or ceiling, and the cornice is but the overhanging extremity of the roof for the protection of the vertical face of the wall from the weather. To introduce such features within is irrational. The masters of the Greek art, so truthful in all they did, committed no such offence against propriety; nor do we find any complete internal entablature (except in the cella of hypæthral temples, where of course they are perfectly legitimate) until art had lost its youthful purity, and the original meaning of the component parts of the entablature had been lost sight of. Without going so far as to deny the applicability of these regular orders to the interior of great halls, or other large interior areas, they are at all events inapplicable to the ordinary purposes of interior designs, or in rooms of moderate capacity. This dogma carried out to its full limit would no doubt extend to the condemnation of labels over interior arches, inasmuch as they are but an overhanging weathering or drip-stone; to the condemnation also of internal battlements and other features exclusively belonging to external architecture. Nor can they be defended, except on the ground that the practice of these solecisms prevailed during the most admired epochs of art. Before paper and paint had usurped their undivided dominion over the decorators of our apartments, many means of internal mural decoration were resorted to—means, it may be, more costly, but certainly more tasteful and more worthy of the character of art. Tyre supplied its rich drapery to embellish the walls of Roman buildings; and, following in the steps of Egypt, Assyria and Greece, the artists of Rome loved to depict the fairest forms and most brilliant conceptions over the walls and vaulting of their apartments. Inspired by the examples of eastern art, the founders of ecclesiastical architecture encrusted their walls with mosaics and painting. The looms of the east also enabled them to clothe their walls with the richest hangings—rivalled afterwards by the weavers of France, of Flanders and of England. But the general demand for economical decoration in latter times has created whole branches of mechanical manufacture to supply the place and mock the semblance of more durable, solid and real enrichment. Costly hangings are represented by fabrics manufactured daily by the mile, and the most precious woods and rich marbles are reproduced by the simple process of the paint-brush and varnish-pot.

The Arsenal of Athens.

In October 1834 the foundations of the first royal magazine were laid in the Piræus, on a point of land running into the basin on the south side of the harbour. The workmen, in the course of their excavations, came upon a series of bases to columns, at a depth of about 2 feet from the surface. The architect, Herr Lüders, of Leipzic, immediately made sketches of them, and the Government directed that the works should be immediately discontinued if these antiques were found to be valuable. Herr Ludwig Ross, a professor of the University of Athens, who had charge of inspecting all newly-discovered monuments, immediately proceeded to the spot, and found four roughly-worked pedestals of columns 0·70 mètres in diameter, and about 2·60 distant from each other, formed of sandstone, inserted in a foundation work of the same material, the line of the series running from south to north. Near the second and fourth there stood to the east two blocks of a bluish white marble, hollowed, like water troughs, and a groove or gutter, formed of flat plates of blue-coloured marble. These plates, which reached from one extremity to the other, were fortunately only disturbed in one instance, in which the workmen had broken the slab into more than twenty pieces. Herr Ross found its lower surface covered with an inscription, for the most part defaced, but in which he easily recognised an account of the persons employed in the arsenal. He caused all the remaining plates, three in number, of which two had suffered by previous ill usage at a remoter period, to be carefully taken up, and on inspection found them to contain similar inscriptions. This discovery led him to the conclusion that the edifice in question belonged to a late Roman or Byzantine period, when the memory of the ancient greatness of Athens and regard for antiquity had sunk so low as to induce them to convert these precious remains to the purposes of modern construction. Ross conjectured that the Skeuothek of Philo (an account of which is to be found in Vitruvius) stood near this spot. And to the question of what has become of this immense structure, Ross replied by asking why we trace such slight remains of the once mighty mass of the Piræus itself. Had the Vandal Byzantines, who appropriated the inscriptions in question to these base uses, gone one step further, and not placed them with their faces to the earth, not a vestige would have been preserved; but fortunately, as if to shun the reproaches of the writing, they kept the engraved side downwards. Covered docks were built by all the great naval Powers — Samos, Corinth, Rhodes, Syracuse and Athens. The docks of Athens cost 1,000 talents. Strabo says they were 400 in number. Each dock held but one ship, and as the number of ships exceeded that of the docks it is quite evident that some must have been in the open air. A naval arsenal or storehouse is called Skeuothek. In the earliest inscriptions the Skeuothek is mentioned as one *par excellence*, in which the rigging or hanging gear was laid up, whilst the wooden framing lay near the ships in the docks. The celebrated new Skeuothek appears incontestably in the inscriptions. Many materials are enumerated as remaining from the building of it. It was the work of Philo, calculated to contain 1,000 ships. Strabo, Plutarch and Appian call it the Hoplothek. Otfried Müller has sufficiently proved ("De Monumentis Athenarum") that Philo flourished in the time of these inscriptions.

NOTES AND COMMENTS.

It is satisfactory to find that a majority of the London County Council (that is, forty members against twelve) did oppose the attempt to coerce the Council into purchasing the supplies of the eight water companies within a fixed period. The water companies, as no doubt was within their rights, have been taking measures with a view to such a purchase, and the present value of the undertakings is more or less factitious. The needs of the inhabitants of London have been disregarded unless extra profit could be derived from them, and in consequence the shares of the water companies have attained a value which is unknown out of London. Justice demands that in purchasing the property only equitable prices should be recognised. The proposal of the Parliamentary Committee placed the inhabitants of London in the position of a railway company that was bound to have works executed by a prescribed time, and must therefore pay an exorbitant sum for the land that was necessary. The Council have acted rightly in insisting on fair and equitable terms for any of the undertakings that may be required, that is, by recognising the true value instead of a juggled value, and for that purpose the possibility of requiring other sources must be considered. The question now is, What is next to be done? The directors of the companies know that the sources of supply are being secured by other places, and therefore in dealing with so important an affair empty threats from Spring Gardens are of no avail. The Council must lose no time in seeking after an adequate source, and it will be unprofitable as well as dangerous to suggest that such a source is to be found in one or two wells near London, although the quantity of water derived from them may amaze ignorant people.

The interest taken by Americans in architecture is suggested by the series of lectures about to be delivered in the Brooklyn Institute. Once a month, from October 21 to May 18, 1892, there will be a lecture. The subjects and lecturers are as follows:—"The Principle of Illusion in Architecture," Professor William H. Goodyear; "Some Instructive Churches and Cathedrals in France," Mr. Barr Ferree; "The Requisites of Museums for the People," Mr. Russell Sturgis; "Some Instructive Examples of the Early French Renaissance," Mr. Rudolphe L. Daus; "Saracenic Architecture," Professor George W. Plympton; "Some Sketches from an Architect's Drawing-book," Mr. William B. Tubby; "The Great Historic Arches," Mr. John H. Duncan. During March and April of next year Professor Goodyear will deliver a course on the following subjects:—"Greek Architecture as Related to Greek History," "The Greek Temple and the Details of the Greek Orders," "Roman Architecture as Related to Roman History," "Roman Architecture East of the Jordan," "The Byzantine and Romanesque Developments," "The Romanesque and Gothic Developments," "The Italian Gothic and the Early Renaissance," "The Later Renaissance and Recent Revivals." When so much attention is given to architecture, it is no wonder so many people expect that the next style is to appear in the United States.

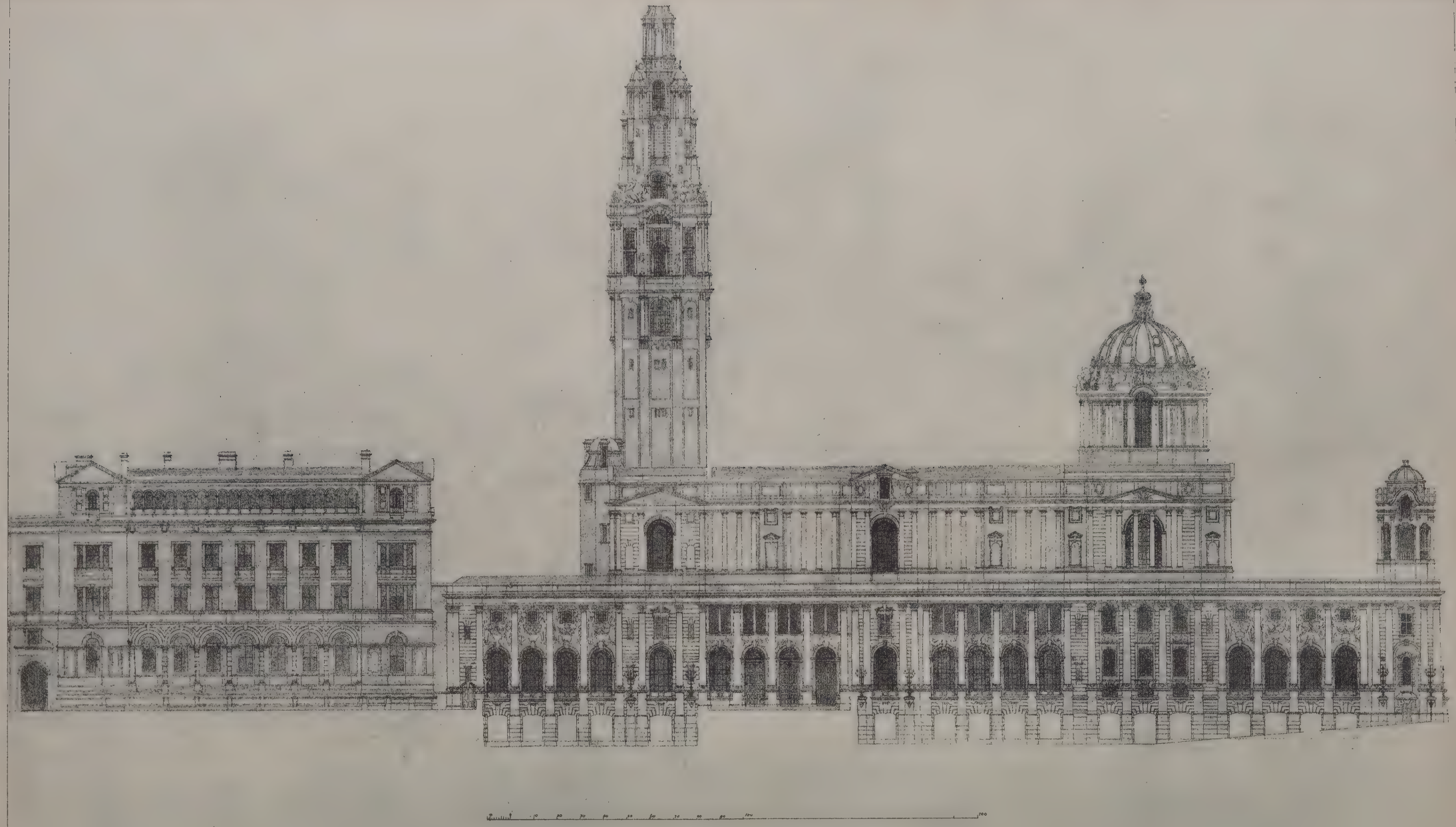
A paper was read by Sir Henry Bessemer, F.R.S., at the Iron and Steel Institute, describing an invention for the manufacture of continuous sheets of malleable iron and steel direct from fluid metal. After several attempts he succeeded in reaching the rolls with some fluid metal, and in producing a thin sheet some 3 or 4 feet in length. This sheet had a clear surface and was almost wholly free from oxidation, and absolutely free from scale. It was as tough as any rolled-iron plate he had ever seen; and it left no doubt in his mind of the entire success of this system of rolling thin sheets direct from fluid metal. Sir Henry Bessemer, having described the original form of his apparatus and the manner in which he now proposed to remedy its defects, concluded his paper as follows:—"With reference to the speed of production, let us assume the mill to be fitted with a pair of 4 feet diameter rolls, 18 inches wide, and making four revolutions per minute, and set to produce a sheet having an initial thickness of one-tenth of an inch, and rolled by the third pair to one-twentieth of an inch, we should thus have a surface velocity of the first pair of rolls equal to 50 feet per minute, and making, when finished, 100 plates, 18 inches by 12 inches, one-twentieth of an inch thick, and weighing 300 lbs., or equal to a production of one ton of plates in $7\frac{1}{2}$ minutes. Hence it becomes a question which is the least costly mode of dealing with a ladleful of fluid steel, forming it into massive ingots in moulds, or making it into thin sheets in the manner proposed?"

A couple of weeks ago we stated that Messrs. Kirk & Randall had written to the London School Board respecting the acceptance of a tender for the Kemsing Road School, which was 527*l.* in excess of theirs. The Works Committee now say that the actual difference between the two tenders was only 121*l.*, one being 16,440*l.* + 441*l.* for brickwork in cement, the other 16,354*l.* + 406*l.* At the desire of the Committee, Messrs. Kirk & Randall are to be informed that the Board are not bound to accept the lowest or any tender.

A form of tender has been adopted by the Builders and Contractors' Association of Victoria, which has interest for clerks of works. It is as follows:—"I hereby tender . . . , but this tender is subject to the condition (to be inserted in the contract) that the person who shall at any time be appointed to act as clerk of works shall be first approved of by me, or by the committee of management of the Builders and Contractors' Association of Victoria. N.B.—This condition is held to be necessary pending arrangements being made between the Royal Victorian Institute of Architects and the Builders and Contractors' Association of Victoria." All the Melbourne architects do not approve of the proposed arrangement, but when looked at from a contractor's standpoint, there is often reason for the stipulation.

There seems to be some difficulty about the proposed enlargement of the Royal Infirmary in Manchester. Some of the most influential citizens and subscribers have declared that while "it is manifestly important that the Infirmary should be retained on its present site in the utmost state of efficiency, any extension of the accommodation thereon seems to us very undesirable." Accordingly they have resolved to send a memorial to the trustees opposing such extension. The Board of Management have in reply called attention to the following remarks of Mr. E. S. Heywood, chairman of the Board, at the general meeting of trustees held on July 30, 1891:—"When the Board approved of plans for the extension of the building, it was their intention to submit them, together with a statement of the cost of carrying them out, to a special meeting of the trustees convened for that purpose, and to accept the decision which might be then come to. They were of opinion that it would be far better to submit a complete scheme of the proposed extension to the trustees than to ask them to decide so important a matter without full information as to plans, cost, maintenance and other material points, without which it would be undesirable for a decision to be arrived at." The Board, they say, wish it to be clearly understood that no plans for extension have yet been adopted, nor even considered, and they appeal to the trustees to withhold their judgment until the Board are able to lay before them what they consider best and necessary to meet the requirements deemed essential for the future of the charity. The correspondence suggests that the plans which are to be sent in are never likely to be carried out.

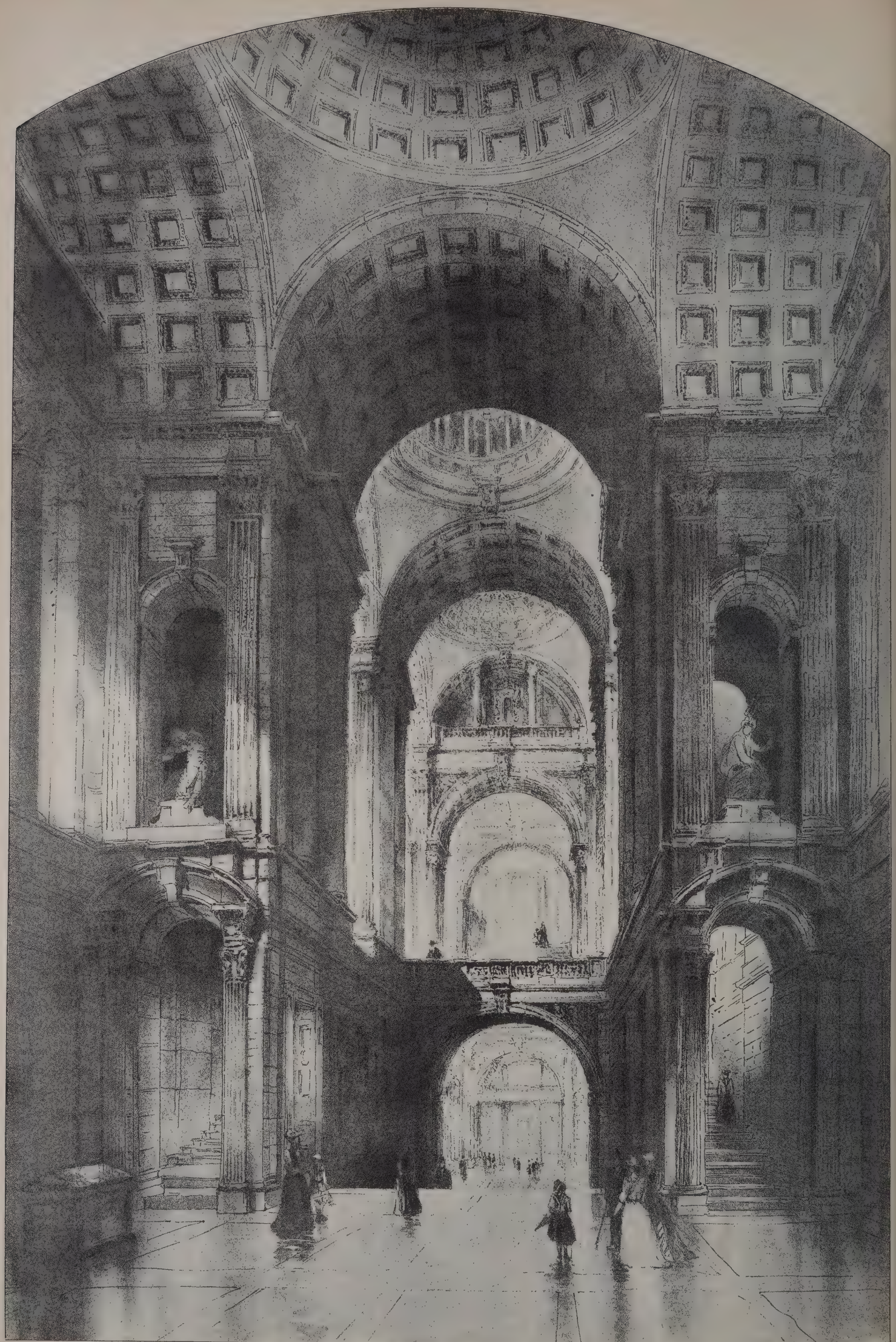
In the middle of April next an exhibition of means and appliances for the prevention of fire will be held in St. Petersburg. It will consist of six sections, viz. means to prevent fires, apparatus for the discovery of fires, engines and chemical compositions for extinguishing fires, appliances for saving life and aiding the wounded, means of transport for firemen and engines, organisation of firemen, statistics and literature. In the first section will be included fireproof construction, systems of heating and lighting, canalisation of electricity, lightning-conductors, composition for rendering materials incombustible. There will be medals and awards, besides prizes in money for the inventions that are considered to possess most utility.



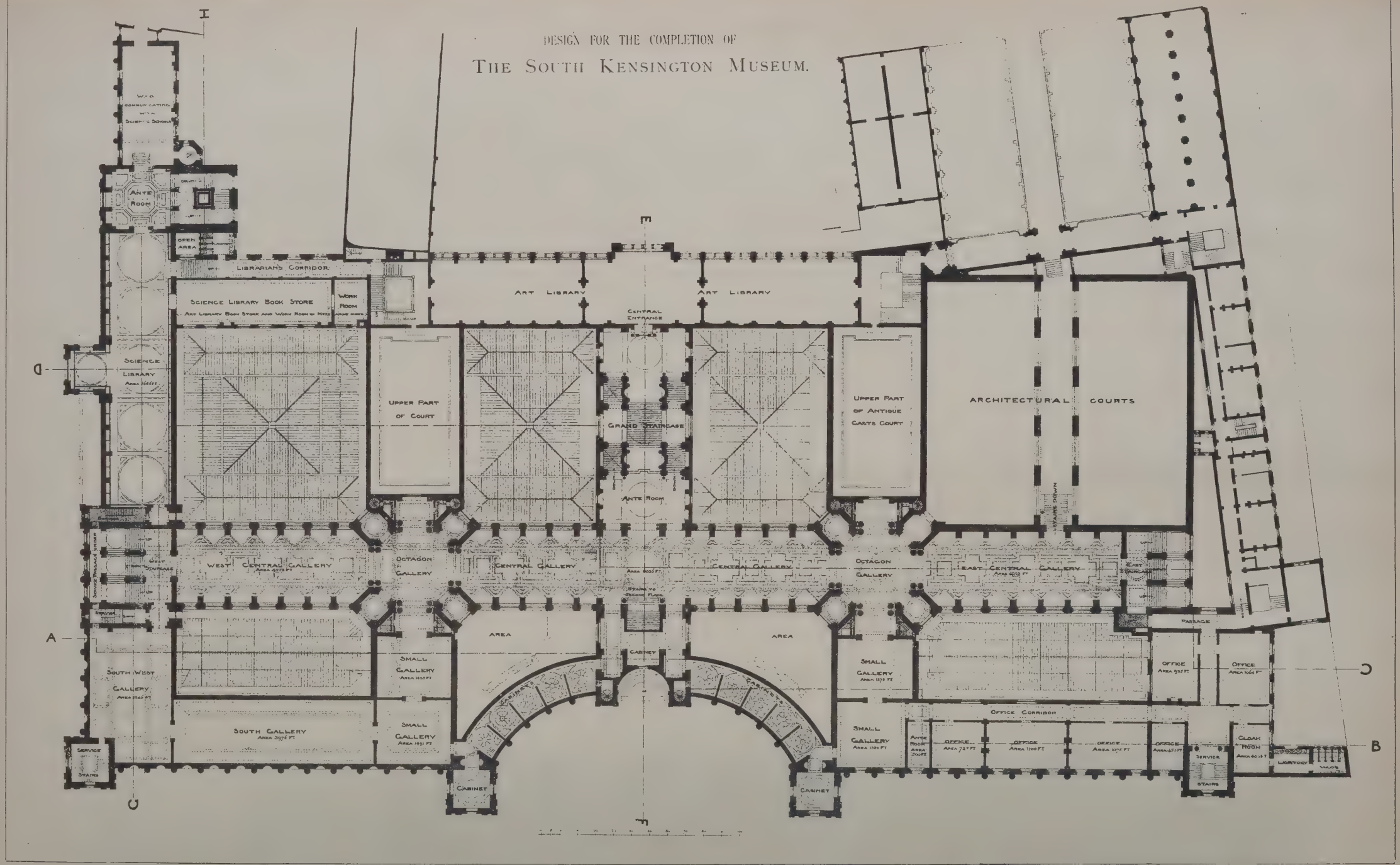
NY PHOTO SPRAGUE & Co. 4 & 5 EASTCHEAP, LONDON STREET, FENCHURCH, LONDON, E.C.

DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM.—(Motto: "Prince Albert.")

ELEVATION TO EXHIBITION ROAD.



DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM.—(Motto: "Prince Albert.")
VIEW ON STAIRCASE.



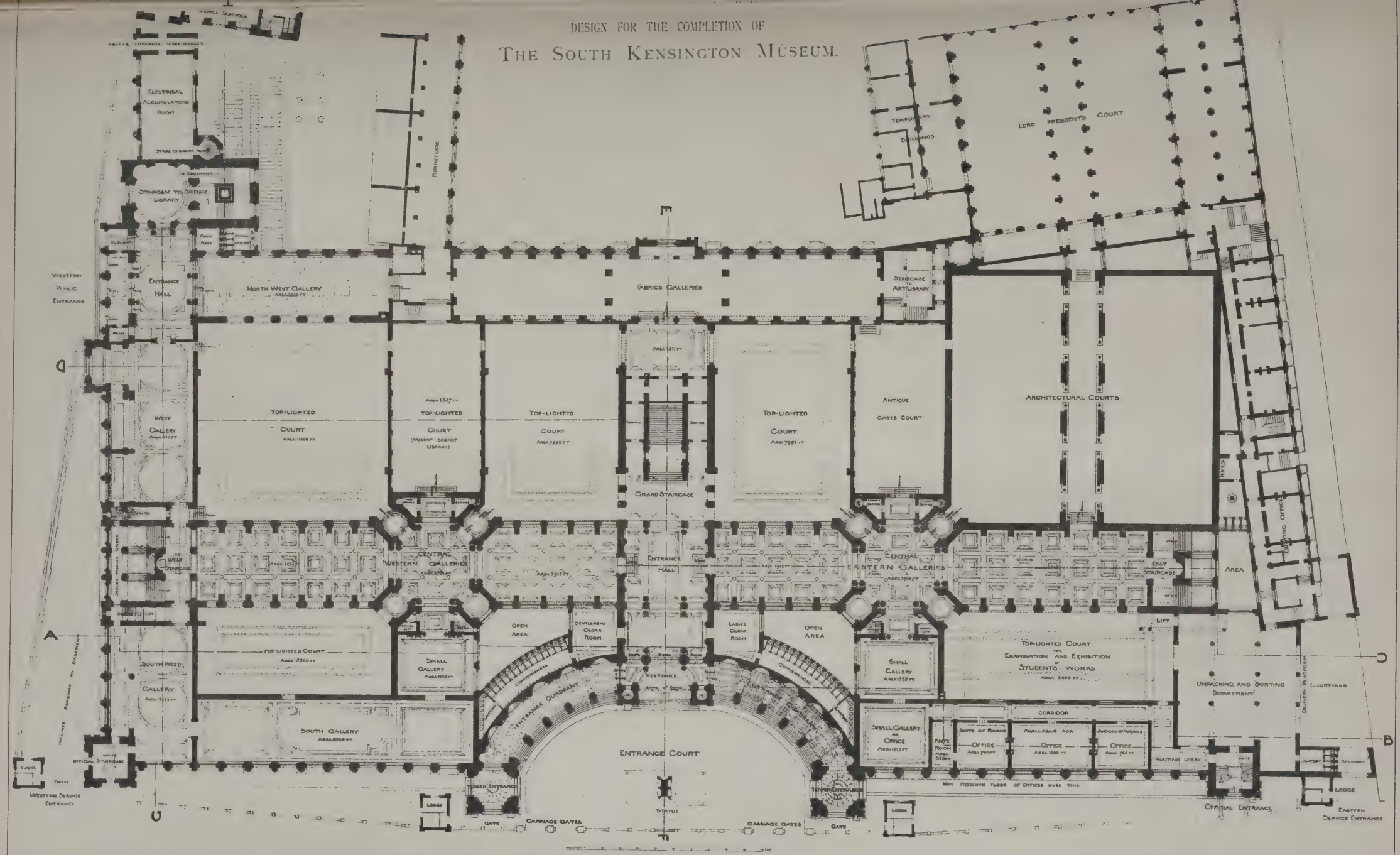
The Architect, Oct. 16th 1891.

DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM.—(Motto: "Prince Albert.")

FIRST FLOOR PLAN.

JOHN BELCHER, Architect.

PHOTO-LITHO SPRAGUE & Co 4 & 5 EASTHARDING STREET FETTER LANE E.C.



DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM.—(Motto: "Prince Albert.")

GROUND FLOOR PLAN.

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

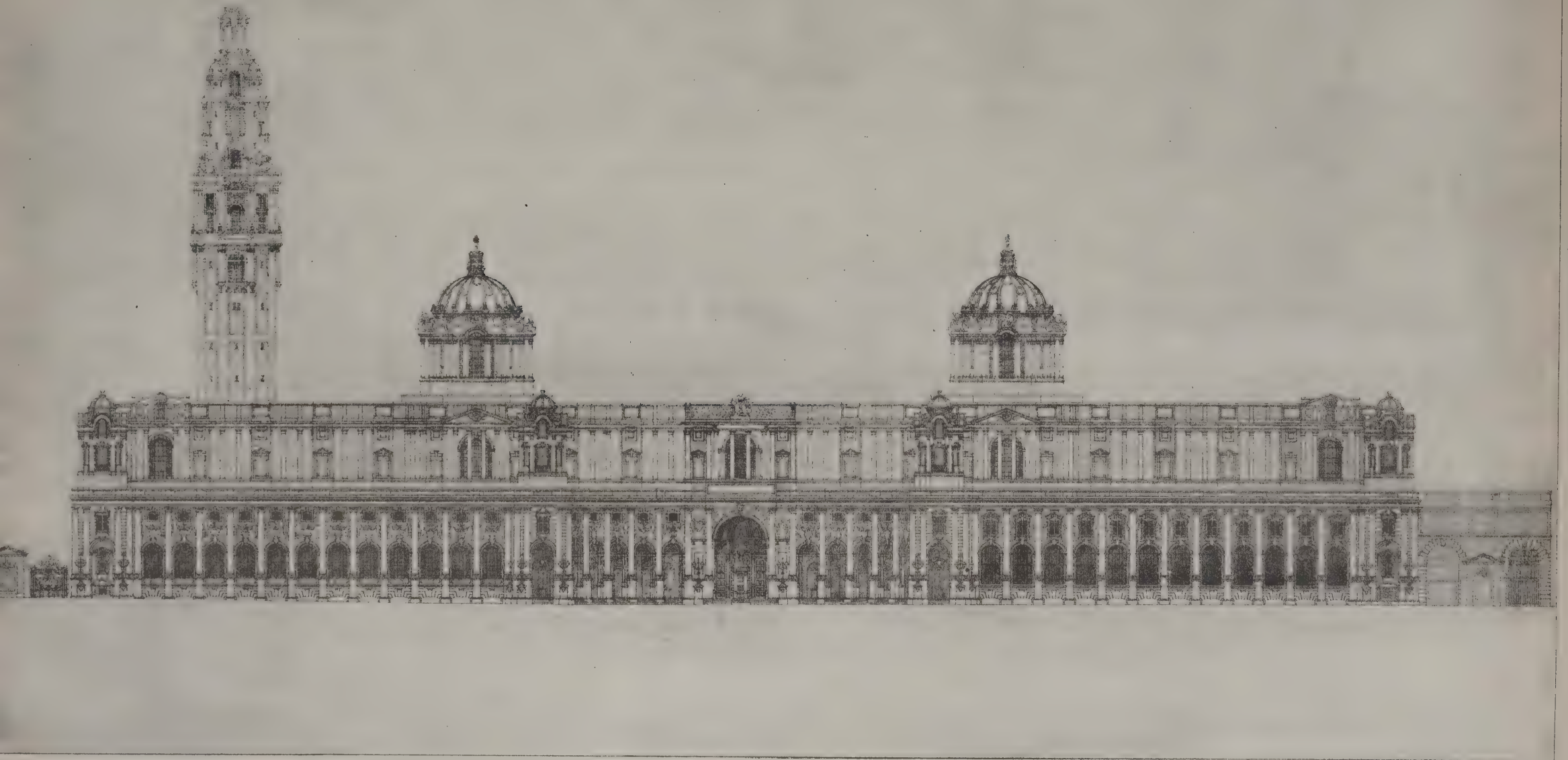


HK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM.—(Motto: "Prince Albert.")

PERSPECTIVE VIEW.

JOHN BELCHER, Architect.



INK PHOTO SPRAGUE & Co 4 & 5 EAST ... 7, FETTER LANE, E.C.

DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM.—(Motto: "Prince Albert.")

ELEVATION TO CROMWELL ROAD.

JOHN BELCHER, Architect.

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ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NOS. 420–425.—DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM. [J. BELCHER.]

THE SHEFFIELD SOCIETY OF ARCHITECTS.

THE Sheffield Society of Architects and Surveyors inaugurated their winter session on Monday evening by a conversazione, held in the drawing-room of the Cutlers' Hall. The president, Mr. C. J. Innocent, delivered his address, which was followed by an excellent musical programme, and the company had also the privilege of inspecting an interesting collection of pictures, etchings and other objects organised by the members of the society, assisted by their friends. The President, in his address, expressed his sense of the high honour done him in his election, and said although the society had not been long in existence it had not been inactive, and its work would be beneficial not only to individual architects, but also to the whole town. Practically all the architects and surveyors in the town had joined, and the financial position of the society was most satisfactory. The present was an age, he observed, when everybody seemed to be concerned about drainage and matters affecting the health of the people. Architects ought, above all men, to be so concerned, and they had every reason to see that in all these things the best that could be done was done. They ought to be ready to co-operate with all public bodies and officials charged with the duty of caring for the public health, and they had a right to expect that their efforts would be reciprocated in a friendly spirit. He suggested that a larger number of students ought to be connected with the society, and in order to induce them to join he thought the society might afford them assistance in the practical aspects of their training, which other institutions in the town rendered them in their artistic work. At the close of the paper a vote of thanks was passed to Mr. Innocent on the motion of Mr. J. B. Mitchell-Withers, seconded by Mr. F. Fowler.

THE LATE F. H. HENSHAW.

WE greatly regret to announce, says the *Birmingham Post*, that Mr. Frederick Henry Henshaw, the eminent landscape-painter, died on Sunday evening at his residence, Green Lanes, Small Heath, at the age of eighty-four. He was very seriously ill some months ago, when he found it necessary to submit to a severe operation. From this he recovered in a manner remarkable for a man of his advanced age, and it seemed as if he had still before him several years of a fairly healthy life. Within the last few weeks, however, he began to fail; there were indications of a return of his former ailment, and finally a weakness of the heart's action warned his medical attendants that there was imminent danger. On Saturday he sank into a condition of unconsciousness, and finally passed peacefully away.

Mr. Henshaw was born on December 11, 1807, in Edmund Street, Birmingham, the place of his birth being now absorbed in the site of Mason College. His father, a manager to a firm of Birmingham manufacturers, intended him for a business life, but the boy showed from very early years a strong bent towards art. He displayed this at the Lancastrian School, Severn Street, his first school, and afterwards at the branch King Edward's School in Shut Lane, Moor Street, and further at the New Street Grammar School, where his early education was continued. Happily, the elder Mr. Henshaw consented to allow the boy's obvious predilection to take its course, and consequently Frederick Henry Henshaw was, we believe, at the age of fifteen, articled to Mr. J. V. Barber, then a well-known and highly competent teacher of drawing in Birmingham, and himself a landscape-painter of no mean quality, as may be seen from some of his works now in the Corporation Art Gallery. At Mr. Barber's the young student had as companions in the studio such admirable artists as Creswick, afterwards the Royal Academician, Thomas Baker, well known in later years as "Thomas Baker, of Leamington," Charles Barber, Robert Brandard and J. T. Willmore, the engravers, J. J. Hill, and many more who subsequently became painters of note. The work of an apprentice at Mr. Barber's was such as to familiarise the students with every branch of pictorial art, beginning with the arrangement of the studio, the grinding of colours, and then proceeding to close and accurate study in pencil, chalk, monochrome-painting, and finally to studies in colour—an admirable method, combining careful work indoors with direct studies from nature. One curious feature of the apprentice's engagement was that until the expiration of the indentures all the work he did belonged, excepting by consent, to the master; and this was a condition to which, with rare departures, Mr. Barber firmly adhered. Mr. Henshaw's apprenticeship lasted until 1828; but previously to that time, in 1826, when he was nineteen years old, he had greatly developed his taste and knowledge in art by a visit to London to study the works of the modern English school of landscape painters, chiefly Turner, Calcott and Constable. These great painters at once fired his enthusiasm and fixed his own practice; to Turner, indeed, he was devoted throughout his life, and he never, up to the period of his latest visits to London, neglected an opportunity of reverently studying the great master's works. It was in the year 1826 that Mr. Henshaw first exhibited a picture—a view of *Handsworth Church*, which was hung on the line at the Birmingham Society of Artists' exhibition, and to the delight of the young painter found an immediate purchaser. After quitting Mr. Barber's studio, Mr. Henshaw began at once to exhibit on his own account, sending to all the provincial exhibitions then existing, to the Society of British Artists in London and to the Royal Academy, where in 1830 four of his pictures were hung. One of these works was bought by Colonel Berkeley, afterwards Lord Fitzhardinge, who proved a warm friend of the Birmingham artist, induced him to remove to London for a time, received him as a guest at Berkeley Castle, where he executed several commissions, and introduced him to many persons of rank who were interested in landscape art. In London Mr. Henshaw remained until 1833, and had he continued to live there, it is more than probable that he would have before long have secured admission to membership of the Academy. But he did not like London, notwithstanding the promise it afforded him, both by his own merits and the influence of the many friends he had made. He was essentially a Birmingham man, and desired above all things to live a free and independent life in his own town; he was an ardent lover of the country, and yearned for the means of easy access to rural scenes. From that time forward his permanent home was fixed at The Cottage, in the Green Lanes, which he enlarged and adapted to the necessities of an artist; and from this favourite residence he never felt the least desire to remove. In later years it became, under the attraction of his presence, the centre of artistic, literary and scientific society in Birmingham; there were few men of note in the town and its neighbourhood who were not at least occasional visitors to Mr. Henshaw's studio and smoking-room combined; there were not a few who, as habitual visitors, regarded this intercourse, prolonged for years, as amongst their greatest pleasures; and there still remain some—sadly thinned in number—who will always cherish the memory of those charming evenings, and the unfailing welcome, and wise and honest and cheerful talk of their kindly friend and host.

Such a life as that above indicated presents very little to record in the way of incident. One of the principal events which marked it was a journey made by Mr. Henshaw soon after his first marriage. The period from 1837 to 1840 he spent upon the Continent, visiting France, Switzerland, Italy—a leisurely journey, largely performed on foot, and affording ample opportunity of studying the greatest works of art and the loveliest and most picturesque scenes of nature. It was a working journey also, for the painter filled innumerable sketch-books with drawings executed with pen and pencil, made many sketches in water-colour, and also produced a few oil-pictures, which still rank amongst his best and most attractive works. It is needless to record in detail the places which Mr. Henshaw visited on this journey. It is enough to say that there was no picturesque district on the ordinary route, or fairly accessible to it, which he did not explore, nor was there any famous city of Switzerland and Italy with which he failed to make himself thoroughly acquainted. He had the advantage of pleasant companionship on a great part of the tour, amongst his travelling friends being Mr. Edwin Clark, the associate of Stephenson in building the Britannia Bridge; Mr. John Johnson, afterwards a famous London architect, then the travelling student in architecture of the Royal Academy; Mr. John Houston, in later life a member of the Royal Scottish Academy; and Mr. Marshall Claxton, at one time well known as a figure and portrait-painter. In Rome and elsewhere he also made friends of many other artists of note, amongst them Mr. Stevens, the designer of one of the noblest works of English sculpture, the Wellington monument in St. Paul's. With these friends, after his return to England, Mr. Henshaw kept up an intimate intercourse, and not infrequently received some of them as welcome guests in the Green Lanes. In 1840 Mr. Henshaw returned to England, stayed for a few months in London, and then came gladly home to Birmingham. Soon after his return he became a member of our Royal Society of Artists, of which he was in later years for a long period an officer, and up to the time of his death was a trustee. His return to Birmingham marked the beginning of the annual sketching tours which for over thirty years constituted an unbroken series, lasting each year from June until late autumn slowly melted into winter. These excursions extended over many parts of England, Wales, Scot-

land and Ireland: the favourite localities of the painter—with one notable exception, to be presently mentioned—being Yorkshire, especially Bolton Priory and Wharfedale, in England; Llangollen and its neighbourhood, in Wales; Galway and the west coast near it, in Ireland; and Skye, in Scotland. From each district, in its turn, Mr. Henshaw brought back with him not mere sketches, to be worked up in the studio, but finished studies, painted every touch and stroke out of doors, in the presence of the scenes themselves, and rendering with absolute faithfulness every subject which he attempted, no matter what might be its difficulties, and regardless of the time it might require. He never was a painter who simply aimed at showing a full season's work, and who was disappointed if the yield fell short in variety and amplitude. If only two or three studies, or even a single work of special mark, rewarded the labour of his annual journey he was abundantly content, for throughout his life his aim was quality, and not quantity. He loved nature too deeply and reverenced her too thoroughly to slur over any attempted presentment of her beauties, while, as to the pecuniary gain to be obtained by his labour, to that as compared with perfection in his art he was absolutely indifferent. For many years he steadily refused to part with one of his studies, but kept them on the walls of the studio for the purpose of reference, and also, as his friends might well believe, out of affection for work which had afforded him such intense pleasure, and into which he had put his whole soul.

We mentioned just now one special exception to Mr. Henshaw's wider sketching tours; this exception was his deep affection for the marvellous trees which adorned Packington Park, the remains of the Forest of Arden. Here he spent the outdoor season of the years from 1841 to 1843, and here for ten or twelve years later he never failed to give some considerable time to his sylvan studies. The works executed in the Forest of Arden are amongst the noblest efforts of Mr. Henshaw's brush. They stamped him as amongst the foremost of English tree painters; indeed, it would be no stretch of assertion to say that in this branch of art he has never been surpassed. Some admirers, not without warrant, think that he stands here unequalled. Some years ago a small collection of these forest pictures—the property of the painter's brother, the late Mr. John Henshaw, who had most carefully chosen them—was offered for sale. The writer of this notice then wrote of them in terms which he now repeats, with no desire to change a single phrase:—"There are no tree pictures nobler in quality, grander in character, more carefully or truthfully drawn. The wonderful thing about these pictures is their intense reality. Retire but a few steps from them, and you feel that it is possible to walk beneath the spreading branches of the great foreground oaks, or to wander, knee-deep in fern, into the dim recesses of the forest. Yet, with all this breadth and firmness, nothing of necessary detail is sacrificed, no 'finish' is omitted—every knot and furrow upon the 'thick, gnarled trunks' is given with marked fidelity; and there is no blot of shade or convenient mass of foliage to evade the drawing of a difficult branch or to hide a botch. All is as strong, honest and open as daylight itself. There could be had no finer examples of English woodland scenery the country through; nor could these have been more lovingly and perfectly painted. These forest pictures are amongst the finest works of one who has never been excelled as an English tree-painter." This judgment was amply confirmed when, in November 1888, a large collection of Mr. Henshaw's pictures was brought together and exhibited at our Corporation Art Gallery, from a desire at once to do honour in his lifetime to a Birmingham painter who deserved to stand beside David Cox as a true exponent of nature, and also to show, not his townsmen alone, but all lovers of art, the greatness and variety of an artist whose modest retirement had checked the spread of the fame he merited. On that occasion we endeavoured to sketch the quality of the painter and the spirit and method of his work, and we now reproduce that estimate:—"The first 'manner' adopted by Mr. Henshaw differed totally from that which characterises the works of his mature period. Though Turner influenced him most deeply, yet he was evidently also influenced to a considerable extent by Constable, and was led to paint broadly, hastily and without special attention to detail; aiming rather at effect than at the quiet and truthful representation of nature. In later years he lamented this period. Pictures of this time—the date referred to is about 1833—were brought to him in recent times to be examined and verified. 'They were,' he observed, when speaking of them, 'causes of disquiet to me. They were painted for the most part very rapidly, and were broader in treatment, and were of a less definite character as to detail than later works.' It was after a long course of travel on the Continent, and on his return to Birmingham about 1840, that Mr. Henshaw adopted the method which has ever since characterised his works—that of careful, even minute and most patient study in the open air, giving the fullest attention to detail in form and colour, in due subordination to the general effect he aimed at. 'I began the practice,' he says, 'of painting out of doors in the neighbourhood'—the Yardley district was a favourite resort with him—'and of making special studies of weeds and foreground material, larger than would be wanted for use, so as to insure accuracy of form and detail.' He mentions, also, that it was a habit with him to paint cattle and sheep out of doors and under sunlight—a characteristic of his works, for he delights in full daylight effects, and has never hesitated to grapple with the difficulties of strongly-lighted scenes. The reference we have quoted as to insuring accuracy of form and detail is a 'note' of Mr. Henshaw's method and of his works. No object, whatever its place in the composition—no weed or wayside flower, or trailing spray of briar, or lichen-spotted stone by the margin of a stream—is ever slurred over. Wherever such an object is introduced, it is as real and true and carefully finished as if it were the leading feature of the work. If it did not seem to be right on the first painting, it was erased and repainted—sometimes, indeed, again and again—until the critical eye of the artist was satisfied. Such a method of working of course entailed great labour and retarded facility of production. On this point we may quote a memorandum in which the artist explains and illustrates his method. He is referring to studies made in Packington Park, familiarly known as the Forest of Arden, which he visited for five years in succession, beginning in 1848. 'As I became more thoroughly acquainted (he says) with the intricacies of form presented by the objects which I had set myself down to paint, I often had to enlarge my studies, and, indeed, for the changes which occurred in the foliage of the trees, my studies often occupied me so long a period as five months each. I commenced my studies in June, and worked throughout the season until late in November. It became, therefore, necessary that I should have during this time two or three studies in hand, which were frequently carried forward during a couple of years, in consequence of the gradual changes in the foliage which occurred during the length of the season.' Down to 1879, when a serious illness rendered out-of-door work undesirable, if not dangerous, the practice above described was characteristic of all Mr. Henshaw's summer work. From June to November was spent in the open air, from early morning until late afternoon, now in Wales, now in Scotland, now on the West Coast of Ireland, or in Yorkshire, or Devonshire—whatever the change of scene the method and the labour were the same. The result was that the painter accumulated in his studio a vast collection of outdoor studies, really finished pictures, which were used by him only as materials for pictures to be painted in the studio during winter and spring. Nothing was done by him at home without constant reference to these invaluable guides, and, in order that no detail might escape record, it was his custom also to refer to photographs of the scenes he had visited, or of special portions of them, these photographs being mostly taken for him by his friend, Mr. George Shaw, who was often his companion from time to time during the sketching season. Thus, by patient working, by prolonged observation and by 'slow laborious strokes,' Mr. Henshaw drew to the perfection of his manner of painting the delightful transcripts of nature which we so much admire. The characteristics of his works are noted even by those who merely glance at his pictures, and are deeply appreciated by those who study them with due attention. Fulness and accuracy of detail, most scrupulous truth in rendering form, beauty and delicacy of colour, subtlety of gradation in tone, force and tenderness united in aërial effects, these are the leading qualities of his finest works, and they are, as remarkable in the smaller as in the more important studies, in the drawings as in the oil-pictures. The method is that of nature herself; the power and the knowledge are those of an artist who lived amongst his subjects, and studied them and worked upon them until he penetrated their spirit, and knew them alike by sight and by heart."

Of the personal qualities of Mr. Henshaw much might be said—of his genuine kindness, generosity, cheerfulness, the entire absence of vanity or self-seeking in his nature; his keen appreciation of the merits of other artists and his readiness to help them, especially the younger men who sought his counsel. Much, too, might be said of the simplicity of his life, his frank hospitality, his undeviating firmness of friendship. All these qualities and many more that redound to his honour will be warmly remembered by the friends who knew him intimately, and who will lament his removal as a loss that never can be supplied. Here space obliges us to close this imperfect record; adding only that Mr. Henshaw was three times married—first to the widow of Mr. James Dowell, formerly of Deritend, next to Miss Terry, of Geneva, and lastly to Miss Bint, of Packington, who survives him. He leaves no children. Indeed, his pictures were his children, as his studio was his home. Of his home we take the following bright and pleasant little sketch, published some time ago in a local magazine, from the pen of Mr. H. F. Henshaw, one of his nephews:—

"Everyone in Small Heath is familiar with the little old-fashioned residence in Green Lanes, with its quaint latticed windows and its low chimneys, to which the ivy and Virginia creeper lovingly cling, and form a cosy home for all kinds of

birds, which can be seen on a sunny day hopping about the chimneys or flying from tree to tree in the fulness of their bright and happy lives. It needs not my pen to tell that here resides a true lover of nature, for the house and its surroundings proclaim the fact far more eloquently than words. The thrush sings from the top of the tall poplar at the back of the orchard, and the sparrow chirps it from the roof. The noble old trees that fringe the road and the fields in front tell the same tale. The thrush is right and the sparrow chirps truly, for here, for over fifty years, has laboured Mr. Frederick Henry Henshaw, the great landscape-painter. But then no one in Small Heath needs telling this, for every boy knows the house, if only because of the large pears that grow in the orchard, or of the horse-chestnuts to be found on the trees. Every one is not, however, so familiar with the interior of the house, and therefore I shall not tire them if I give a slight sketch of the studio. The whole of the rooms bespeak a love of art, but one must go to the studio to see the true home of the artist. It is a large, low-roofed room, and the walls are smothered with pictures. Over the old-fashioned fireplace, in which large logs of wood are cheerily blazing, is a fine specimen of the artist's own work, the subject being an old wooden bridge spanning a river; to the right is another of his productions, a copy from Claude, a landscape showing the beautiful orange tints of a soft Italian sunset, whilst on the left is a fine work of Nicholas Poussin. Except for the spaces taken up by bookcases, well stocked with volumes which testify that the occupant is a lover of literature as well as of art, the walls are covered with pictures and studies. The numerous easels, too, ranged about the room also bear studies, the subjects usually being forest scenes, trees, or masses of rock covered with moss and lichens. The studio is, in fact, eloquent of the man who has lived and worked in it for so long a term of years. Nature in various forms smiles on you from every side; look which way you will, your eye meets tree and fern, mountain and stream, whilst in the centre of the room is a sketch nearly finished, depicting a familiar Warwickshire scene. The picture is not complete, however, without the occupant, a cheery, white-haired old gentleman, who welcomes you in with the kindly smile and hearty 'How do you do?' which at once puts you at your ease, and in a few moments you are holding a pleasant conversation with him."

MODERN VENTILATION.*

WITH an audience such as this, composed exclusively of past masters in scientific sanitation, I am relieved of the necessity of preluding this paper with any arguments as to the importance of the subject. I do not think, however, that the opinions of many of us would coincide, if required to define good ventilation. Apparently the point of perfection would be attained if we filled our houses with air precisely similar, in its percentage of injurious matter, to the external atmosphere, varying, however, the temperature to suit our ideas of comfort. This may appear a simple matter, but unfortunately not only have different persons different ideas of comfort, but doctors themselves disagree as to what change of air in a room constitutes efficient ventilation. In the case of heating we have a thermometer to guide us, and the human mind is so constituted that it conceives the body to be warm, if only the thermometer indicates a comfortable temperature. With ventilation it is different. Persons who have been in the room for some time must feel comfortably warm; those coming in from a sharp walk in the frosty air must feel cool; draughts must not exist, and, if the building possesses a gallery, the temperature there must be as comfortable as that in the lower portions of the house. Too much warmth is called "bad ventilation"; too much draught is "bad ventilation," so is too much cold. There are many difficulties which arise in aerating buildings, and although the natural laws utilised in such a task are well known, unalterable and simple, yet the applications of them are diverse.

I will briefly indicate the more usual plans to consider their advantages and disadvantages, and from these to gather materials for the delineation of a system which shall, as far as possible, obviate all the objections. In the first place, we must consider the essentials of a good method of ventilation, then must see how they are complied with by the usual systems, and how the problems of their failure upon certain points may be solved.

The first essential of a system of ventilation is that it shall not produce discomfort by causing a feeling of cold. Air, even warm air, impinging to a perceptible extent upon the skin's surface, causes rapid evaporation, and the avoidance of this should be the first consideration. It is this evaporation which causes "a cold," and the mere expansion of the air by passing it over heated surfaces does not prevent it. Then a perfect system is under complete control. It must be in our power to increase the intake of air and the rapidity of its expulsion, as circumstances vary. A hard-and-fast rule cannot be adopted, but we must have a system which at will may wield a giant's power, or be quiescent. Again, it must be cheap, and of such a nature as to admit of its application to existing buildings without radical alteration; to cottages or to palaces. It must be simple, so that inexperienced persons may understand it; and scientific, so that accepted philosophical formula may enable success or failure to be reasoned out on paper.

If a system complies with these requisites, and yet effects a complete change in the atmosphere of the building so thorough that no person is obliged to inhale products of previous respirations, then I think we may look upon it as perfect. The nearer it approaches this perfection, the more worthy its adoption by sanitarians. By sanitarians I mean those upon whom we rely in sanitary matters — yourselves, surveyors, architects, civil engineers, &c. But it is very certain that the great responsibility rests upon those controlling new buildings either for the owners or on behalf of local authorities, and I am glad to say that they are aware, fully I think, of their responsibility, severely critical of any innovation in sanitary matters, but keen to appreciate what their judgment and experience shows is a practical advance.

We may divide ventilation systems into two classes, naming each by its method of dealing with the mass of air to be changed. One class effects a movement by increasing the atmospheric pressure at one point, the other by attenuation, and in both cases the effort to regain equilibrium is the movement attained. One is a method of "Propulsion," the other "Extraction"; one tends to increase density, and the other to lessen it. You will observe that the tendencies I name are absolutely governed by the disproportionateness of the inlet and outlet areas, or by the amount of friction arising in either case.

The most usual mode of effecting ventilation is the extractive action of the wind upon the upper extremities of shafts or flues, and although the aspirating effect can only be exerted under certain conditions, yet there are so many different inventions in the direction of procuring these conditions, that any attempt to describe them in detail is hopeless. But all aim at one object—that the passing wind shall produce a rarefying effect at the particular point where it crosses the surface of the still air in the shaft or cowl, thus inducing a movement in the direction of the partial vacuum.

Most of you have read the list of results given by Mr. Helyer in his work called "Sanitary Houses," and you will have noted that there the open tube is placed far down the list. But these tests, interesting as they are, give no idea of the relative value of the cowls tried, the chief information being as to which cowl extracted most under the then conditions and directions of the wind, or which allowed the least down blow. It is obvious that a wind inclining towards the earth at however small an angle (Glaisher's balloon records prove distinctly that actually vertical currents of air occur) would entirely prevent the open tube from being an outlet, whilst ingeniously-constructed cowls would be scarcely adversely affected at all.

The cowl which seems to me to approach nearest to the conditions of the open tube, without its disadvantages, is the cowl invented by William Sugg, of Westminster, in which the top of the flue is enlarged and covered with a flat plate in which are set numerous small tubes. Thus a flat cap, fixed an inch or so above these outlets, may easily be of such an area that the downward angle of obliquity, at which any wind could possibly enter, must necessarily be very acute, in fact practically nil. Thus the extractive power of the open tube is very nearly obtained without the difficulties of down blow. Putting aside all questions as to the kind of cowl, it is certain that with a wind moving, ventilation and adequate ventilation may be obtained. But it fails upon all the essential points except one. If the wind exceeds a moderate breeze the extraction is too rapid, producing very disagreeable draughts, and is only under control by the partial or entire closing of inlets and outlets. And unless the wind remains constant and equal for a period unusual in this latitude, this opening and shutting might well engage the attention of a couple of men. Persons in a room ventilated by means of extracting cowls alone are at the mercy of every variation of the wind, a condition of things quite unworthy of our times. But nearly every building is so ventilated nowadays, and it may appear difficult to reconcile my opinions with the fact that many of the most eminent architects of the day are satisfied with ventilation by cowls alone. Ingenious methods have been devised for nullifying the serious objections I mention, the most intelligent being the adjustment of an intricate labyrinth of cords, weights, pulleys, dampers, &c., by which the whole ventilation scheme may be amended and the entire aperture closed. Persons destitute of invention arrive at the same end by stuffing dusters and newspapers into the ventilator, but still the fact remains that there is a ventilator on the roof, and (again calling to mind that

* A paper read by Mr. J. F. Simmance, at the Free Library, Liverpool, on October 10, before the Association of Public Sanitary Inspectors of Great Britain.

thermometer which, fixed at 70 degrees, saved 50 per cent. of fuel) that is considered by the plastic human mind as sufficient evidence of ventilation. But the uncertainty of the method of extracting by cowls alone is too apparent for discussion. It is difficult to believe that architects can place reliance in ventilating engineers who prepare hard and fast formulæ on the subject, and who say, "A cowl of my make, of such a diameter to every so many feet of cubical area, will extract so much air per hour," without taking into consideration the wind, which has to provide engine power for the whole business, and which is absolutely master of the situation. The only one of the essential conditions with which the cowl system complies is its cheapness. The system for future use is not one dependent upon the whims of the wind, and we must look for a force more reliable and controllable. Such forces are not very numerous. We may use water, steam, or gas, either as spray injectors, or as motive power for fan-driving. Gravity may be used for the same by means of weights and pulleys, but I do not think it is often adopted, nor are clockwork (spring motion) or electricity. Now all these are controllable, and may be made to increase or decrease the ventilation at will, and to propel air into a room or to extract. A water-jet is simple, cheap and easy to work; its disadvantage is that the air becomes saturated. This is all right in summer, but in winter the air must be passed over some absorbent material, and then again the jet is affected by frost. As a power for fan-driving it is good, but only has one rate of economical speed, according to size of engine and fan. Somehow water motors are not yet very popular, and it is only amongst organs and barbers that they make notable headway. This is possibly the fault of the water authorities, who do not encourage motors, and it may also be on account of the uncertainty of water supply unless a storage is arranged, and the difficulty then is to get head enough.

For spells of work of a few hours' duration the gas-engine is infinitely preferable for fan-driving, whilst for large work a steam-engine is as yet unapproached. In all these methods the question of position, whether to extract or propel, is optional. At the Liverpool Town Hall the fan extracts, and at the Mersey Railway, Hamilton Square, the 30-feet fans extract. At the Glasgow Infirmary, propulsion is the method. A paper upon this latter installation was read at the meeting of the British Association, and many arguments were brought forward to prove the advantages of the method. As these will apply to all similar cases of propulsive ventilation, I will mention the more important points.

The propulsion of fresh air into the building at the floor line, and not the extraction of foul air by way of the roof.

The filtration of incoming air by passing through damp material.

The absolute prevention of back draughts or down currents.

There is no doubt that some of these items are real advantages, but these are not peculiar to the system under consideration. It is difficult at first glance to see the difference between the principles of extracting at the roof-line, and forcing out at the roof-line; but later on in the paper we find a sort of explanatory note. The air in the building is compressed to the extent of 1-20th to 1-10th of an inch of water, and so should there be any leaky joint of a drain or soil-pipe, sewer gas cannot escape, the external pressure being the greater. Ventilation by extraction acts in just the opposite direction, and sucks out sewer gas from faulty plumbing work. The fallacies of the arguments are apparent to me, and probably are already to you. To maintain a pressure of 1-10th of an inch of water in a room by means of a fan, means that the exits must be smaller than the inlet, so that the pressure accumulates, and at first one does not see the object of this arrangement. But it becomes startlingly apparent when the faulty plumbing comes in, and it is evident that it is for the sole purpose of guarding against Glasgow plumbers that the air of the Infirmary is maintained at this undue density. But supposing such an internal pressure valuable sanitarily, would not the opening of a door or window upset the system by releasing the pressure? I think, too, that the provision of an abnormal atmospheric pressure upon the house side of a w.-c. trap is a distinct mistake. Seals of traps are not too deep as it is, and with the house side further depressed, and part of the proper seal sent down the branch soil-pipe, it appears to me that the impulse of shutting a door or of the closing the outlets for a few seconds might easily unseal the trap, and would certainly do so if coincident with a flush on the same stack from another floor. The convenience of being able to filter the air as it comes in, and to warm or cool it, is undeniable; but the same is arranged for in most systems.

The method I advocate, and arguments in the favour of which I wish to place before you in this paper, is an old one, the very oldest in fact, but its successful application in the particular direction I desire to describe has, until recently, been difficult. The problems I think requiring solution are those attending the proper and economical utilisation of heat to ventilation. As I say, it is the oldest system, as old as time itself. The aëration of the entire earth is effected by it. The winds which sweep through crowded alleys and courts, scattering the stagnant exhalations of many lungs, of much filth and possibly of much disease, are heaven-sent disinfectants, and their sole motive force is heat. The almost imperceptible breeze which creeps amongst, and yet scarcely stirs, the blades of grass, which carries the tiny green shoots their diet of oxygen and removes the resultant impurities, or, it may be, brings the change of diet and, parting with its load of carbon, is revivified by the plant itself—this gentle wind has no cause but heat, and but for heat would not exist. With such examples surely we cannot be wrong in looking to heat as the true and natural source of ventilation.

There is a way of applying heat to ventilation—cheap, automatic and suitable for all classes of buildings. This is to utilise the heat of gas-lighting. Gas is now so general that we may consider it almost universal; but in country places, where petroleum is the only means of lighting, my remarks may be deemed to apply equally to it.

I am able to say definitely that the amount of gas (whether from coal or from petroleum) which will light a room adequately will ventilate it adequately. Only the system must be a good one. If it is to be successful there must be no rule of thumbwork, but to instal it properly is no more expensive than to fit it up in a manner which will insure failure. It is a matter which has received little attention, and for want of such attention has been relegated to the background. The difficulties in the way have appeared insurmountable, and many architects after considering and perhaps trying the system have become doubtful. The installation has been expensive, as flues have had to be bedded in non-conducting material to prevent danger, and it meant pulling a building to pieces (if not being lighted *de novo*). Then the lights wore out, required new burners, cleaning, and were generally rather inaccessible. The difficulty of preventing down draught, too, was great, and to overcome this the flues had to be carried in a serpentine way round the building and up the roof until the flue top could look triumphantly down all the neighbouring chimney-pots. This generally stopped a blow down, but just as certainly stopped any draught up. All the heat of combustion was absorbed by the shafting before it had gone many feet, possibly condensed, and in that case dropped in water, and spoilt the ceilings and tempers of people below. Ventilating by gas-lighting was looked upon as a nuisance, and extravagant pendants, fitted with fishtail burners which blackened the ceilings, and also the reputation of gas-lighting, were and are to a large extent looked upon as the most scientific and useful way of using gas. But all the faults I have named are non-existent in a properly-arranged system, the installation is cheap, and the results in lighting and ventilation most satisfactory. The ceilings and decorations are preserved, and architects can, by selecting such a system, insure those two desiderata, good light and good air, without which no building, be it as noble as the Strand Law Courts (where I am told the windows won't open, and where the accumulated sighs of defeated suitors form the only atmosphere), or as useful as the Rotunda Lecture Hall, can retain the admiration of the public.

A ventilating gaslight must be without glass or breakable material if fixed at such a height as not to be accessible at all times, and must be easily lighted from below. It must be shadowless, and be susceptible of being reduced in power to such an extent as to give off a heat of not more than 100 deg. at 6 inches above the point of ignition, and it must be capable of being increased until its full power causes an intake sufficient to fill the room with fresh air in ten minutes. The shafting from the light must be such that its external heat is practically nil, whilst the internal temperature must be very high. Its outlet must not disfigure the building, and must be arranged so as not only to prevent a blow down, but a suck down, or that great enemy an external compression. These features (which are quite indispensable) can be arranged by the aid of recent inventions, and indeed all the previously conceived objections to ventilation by gas may be obviated.

The light which I have found to answer best is the vertical-flame system of William Sugg. This adopts burners of steatite, that extraordinary material which, soft as meerschaum naturally, attains a maximum hardness when heated to the melting-point of cast-iron. It is non-conducting and practically everlasting, non-corrodable and unalterable in dimensions by heat or cold. A cluster of such burners up to the required greatest power are placed immediately below the mouth of an extracting shaft, communicating direct with the open air either perpendicularly or horizontally. You will probably, and naturally, think that a flame burning vertically close to the ceiling wastes the greater part of its light upon the cornice of the room, but it is not so. The experiments made by Mr. Dibdin, chemist to the London County Council, and who is fast attaining the rank of one of the first scientists of the day, prove this conclusively. He found, and stated before the Society of Arts, that the angle of 45 deg. to the vertical of the flame under test gave the greatest result in light. In the ingenious ventilating light of which I speak,

the downward rays at that angle cover the outer area, whilst the upward angle rays are returned to the spot immediately below the light by an enamelled iron reflector. Thus a result in light of great brilliancy and economy is obtained. The heat of combustion, being enormous immediately over the flame, ascends through the aperture provided, and travels along the shaft. Now this shaft is the subject of a further patented invention, and is lined throughout with a material known as asbestos felt. This absolutely prevents any condensation (which occurs when the products touch the bare tube, and which is not at all prevented by covering the outside of the tube), and not only so, but utilises the great principle in ventilating, viz. the conservation of heat. Not only is the outer case kept cool, but the inside is kept hot, and whether the shaft is horizontal or vertical, the heat is sustained with little loss through its length. At a suitable point communication is restored between the inner hot shaft and a tertiary flue or casing which opens into the room round the ventilating light, and with the impetus gathered from its travels (for you will remember it is not losing heat) the inner cone of hot air rushes out, causing an aspiration in the outer air-tube equal to the action of a gale of wind at a happy angle upon an open tube. Thus, by aspiration and expansion, air is drawn from the room in quantities controllable by simply turning a tap, and the output varied from 15,000 cubic feet per hour to 300,000, for a foot of gas in such an apparatus as I have described will extract nearly 3,000 times its own volume of air.

The question of "back draught" or "down draught" is one which will occur to many of you, and it is an important one. We can stop a blow-down with a cowl, but what cowl will stop air from passing down it if sucked into the room by some force greater than the wind's action on the cowl? If a fire is burning at the foot of a tall chimney, the outlet of which is higher than the cowl, how can we prevent the fire from drawing its air supply from this convenient, cowl-protected inlet in the roof? As I have said before, no cowl of itself may stop it. But in the ventilating light scheme the difficulty is surmounted by the insertion in the cowl of a disc of talc or similar material, which is perfectly flat, and rests upon the end of the shaft, which, being carefully and squarely cut to meet it, makes a sound joint, air-tight against any external air. The disc is threaded on a central pin, and is attached in no other manner, nor can it become rigid in any way. Now the theory of this valve is bound up with that of the non-conducting lining; each is to some extent imperfect without the other, but together they utilise that power which has, I think, never before been brought to bear on ventilating lights. This is the "conservation of heat" already mentioned. You are aware of the rule which makes hot air ascend—it is simply pushed up by the weight of cooler air descending, and the impulsive force of heated air is according to the degree to which it varies from air at normal temperature. We will instance a column of air 1 foot square by 20 feet high. This weighs about 1·6144 lbs. What keeps this column of air from rising will be the fact that neighbouring columns of air the same dimensions are at the same temperature. We will consider such a column as being contained by a non-conducting shaft, 20 feet long by 1 foot square. This we will suppose to be subjected to heat, but before applying the heat, we close the top of the column with a flat plate of no weight, and on this place shot of known weights. When the heat is started the air in the column expands, and at first the surplus contents flow out at the unclosed end. The hottest air rises up the shaft to the top under the plate, and a pressure is exerted upon this plate equal to the difference in weight between the heated air in the column and a similarly-sized column of unheated air. If our column of heated air is at 480 deg., then we have doubled its volume, halved its density, and obtained an upward pressure of half its weight, that being the difference between the heated column and an imaginary cool column. So, if the plate we speak of is weighted to ·7 of a pound, still the upward force will lift it, and, *nota bene*, if a down draught presses upon the plate to any extent less than the upward impulse, the plate will still be lifted up and the exit take place in spite of down draught. This plate is represented in our ventilating schemes by the exit valve, the disc. We will suppose an external compression of the atmosphere to exist which holds this disc-valve tightly on its seat, then the heated products from the ventilating light fill the tube right up to the valve, and, losing very little heat by the absorption of the shaft, continue to get hotter until the upward pressure exceeds that of the down pressure, forces it back and makes exit. Should the down pressure be severe, as long as it does not exceed the ·8 or ·9 per square foot the conservation of heat (soon reaching 400 or 500 deg.) will cause an exit to be forced. Thus a down pull on a ventilating outlet may be overcome, and with these inventions ventilating exits may be made in places which have been impracticable hitherto. But we have another assistant in this matter. The exit valve spoken of is placed in one of the powerful Sugg cowls before-mentioned, so that not only does the light cause extraction, but the cowl does its work when no light is going. Its work is such that the mere passing of a wind across it will cause extraction and keep the valve balanced in the current until a cessation in the upward current, and the consequent threatening of a down draught, will restore it to its seat. But you will say with reason that such a cowl extractor with a heavy wind will cause undue ventilation. By a simple mechanical arrangement the exit valve is in exposed situations made to act as a regulator, which allows free outlet so long as the fixed output is not exceeded, but, under a violent extraction, closes the orifice in proportion to the increased suction, keeping the output regular and unaltered. For about two years some of these have been in work, and have never failed, nor can any traces of wear or disorder be perceived; apparently they are as good as ever, although exposed to the full heat of ventilating lights (in one case within 3 feet of the flames).

As regards the efficiency of this system of gas ventilation, I examined recently an installation at the Grosvenor Museum, Chester, whence unventilated lights had been removed. In this case the committee, sitting under the presidency of the Duke of Westminster and the chairmanship of Sir Horatio Lloyd, had carried out extended experiments in the rooms of the Technical Education Department, and authorised the honorary secretary, Mr. J. R. Griffiths, of Chester, to give a certificate to the effect that the temperature of the rooms did not rise one degree, with the rooms full of students and after hours of work. The lighting was characterised as perfect.

The question of air inlets must be answered; but I should hesitate to advocate the arrangement of a greater area of inlet than outlet, unless circumstances precluded the ample distribution of the inlet orifices.

There appears to be no one of our conditions with which ventilation by gas-lighting does not comply if carried out as I have described. It is cheap if put in when the building is going up, the light itself being the only item of cost worth considering. It can be fixed almost anywhere and can be made to work well. At one stroke the lighting and ventilation is accomplished and you have the best of both. There is no advantage claimed for electricity which is not possessed by gas so used—cleanliness, coolness and efficiency—and comparison does not exist upon point of cost. Every small house could be fitted whilst building with the shafting, leaving the tenant to select his light, and this he could buy at as little cost as a gasalier. Finished houses can be ventilated without pulling them to pieces, and the parts of the system which would be considered fixtures and unremovable are the cheapest parts of the installation. The light may be in powers from 16 to 2,000 candles, and will last for years. There is no danger in their use, and gas explosions from sliding and other imperfect chandeliers are abolished. You only pay for gas (less than you would for a less scientific system), and you get ventilation into the bargain. You have an ever-ready mechanical force, which will at any time educt vitiated air from the room by the simple means of a lighted match and a turned tap.

MEDIÆVAL EXPLORATIONS IN ENGLAND.

THE earliest systematic excavations in England of which we have a definite account were made among the ruins of Verulamium in the earlier part of the eleventh century by two successive abbots of St. Albans, Ealdred and Eadmer. We learn from Matthew Paris that Abbot Ealdred overthrew and filled up all the "subterranean crypts" of the ancient city, as well as the vaulted passages, with their windings, some of which ran under the bed of the river. He did so, says Mr. Wright, because they had become hiding-places for thieves and strumpets. The subterranean ruins of Roman Paris are described as the haunts of a similar class of society in the twelfth and thirteenth centuries. Ealdred also destroyed and filled up as much as he could the fosses of the ancient city, and certain caves, which afforded a place of refuge to the robbers who prowled in the neighbouring woods. The abbot laid up carefully all the unbroken tiles or bricks and the stones which were fit for building as materials for the new church which it was his intention to erect. With this object he made great excavations in order to discover stone buildings. As the workmen were digging near the bank of the river they found oak planks with nails in them, and covered with pitch, apparently part of a ship, as well as old rusty anchors and oars, which proved, as Matthew Paris thought, that the sea had once encircled the town. Moreover, they found shells such as are commonly cast upon the sands of the sea-shore. The places where these were found received the appropriate names of Oysterhill, Shelford, Anchorpool, Fishpool, &c. There was also a deep den, surrounded by a hill, with a subterranean cave, which had been inhabited by a dragon, and was called Wurmenhert. This likewise Abbot Ealdred filled up and defaced, leaving, however, traces of its former condition. When Ealdred had collected together much materials, both of stones, tiles and wood, he died prematurely in the middle of his labours. His successor, Eadmer, continued the excavations. As the work-

men were digging up the walls and foundations of the old buildings they uncovered the foundations of a vast palace, and they found a hollow in the wall like a cupboard, in which were a number of books and rolls, which were written in ancient characters and language that could only be read by one learned monk named Unwona. He declared that they were written in the ancient British language, that they contained "the invocations and rites of the idolatrous citizens of Wærlamceaster," with the exception of one, which contained the authentic life of St. Alban. The abbot preserved the latter, and had it translated into Latin, and as soon as the translation was completed the original crumbled into dust. This story was probably in part a pious fraud, designed to give authority to the legend of the saint. That books were found is rendered probable by the fact of their being termed rolls, which we know was the form of books among the Romans, and not among the Saxons. The other part of the story is also probably a fable, that it appeared from these books that the two principal deities of the citizens of Verulamium were Phœbus and Mercury, "called by the English Woden," it being chiefly inhabited by merchants, of whom Mercury was the patron. These idolatrous books the abbot committed to the flames. "And as the abbot before mentioned diligently turned up the earth where the ruins of Verulamium appeared, and found squared stones with bricks and columns which he reserved for the erection of the church he proposed to build for St. Alban, the workmen found in the foundations of the old buildings pots and amphoras, elegantly formed of pottery and turned on the lathe, as well as glass vessels containing the ashes of the dead, for the ancients used to burn the bodies of their dead, whence the word *funus*, quasi *fumus*. There were also found the ruins of temples, altars overturned and idols, and various kinds of coins which were then used." The idols were, without doubt, Roman statues and bronzes. The abbot, with characteristic vandalism, ordered them all to be broken to pieces.

From these and other excavations on the same spot were probably derived some of the valuable gems enumerated in the inventories of the relics of the abbey of St. Albans preserved among the Cottonian MSS. One at least of these gems was an ancient cameo, of which a drawing was made by Matthew Paris. It appears from a life of the abbots of St. Albans that many other engraved cameos were in the possession of the abbey. The name cameo was itself of Mediæval formation. We find mention of them in many monastic inventories and other documents. In the inventory of the church of Anicy, made in 1444, we find a gold pontifical ring with a cameo, on which were four figures. In 1321, Geoffrey, Bishop of Laon, gave to his church a ring with a cameo. Among the precious stones adorning the mitre of the abbot of St. Victor at Marseilles in 1358 was a cameo with the figure of a man's face looking to the left. Other instances will be found in the Lexicon of Ducange. An immense number of cameos (*kamahutis*, *camautis*, &c.) and engraved gems appear among the ornaments and plate in the treasury of St. Paul's Cathedral in London in the year 1295. These engraved gems were frequently inserted in the counter-seals of secular and ecclesiastical personages of rank, and contrast singularly with the rude engravings of the seals themselves. A number of impressions of such counter-seals still existing are engraved in the plates of the first volume of the "Vetusta Monumenta."

People were eager to possess engraved stones because of the peculiar powers which were supposed to belong to them. Thus, a gem representing Pegasus, or Bellerophon, was good for warriors, and gave them boldness and swiftness in flight. One with a figure of Andromeda had the power of conciliating love between man and woman. A gem bearing the figure of Hercules slaying a lion or other monster was a singular defence to combatants. The figure of Mercury on a gem rendered the possessor wise and persuasive. The figure of Jupiter, with the body of a man and the head of a ram, made the man who bore it beloved by everybody, and he was sure to obtain everything he asked. A stone bearing the figure of a hare was a defence against the devil. A stone with a dog and a lion on it was a preservative against dropsy or pestilence. The figure of Orion was believed to give victory in war. A stone showing Perseus, holding in his right hand a sword and in his left the Gorgon's head, was taken to be a preservative against lightning and tempest and against the assaults of devils. A stone on which was engraved a long-bearded man sitting on a plough, with a bending in his neck, and four men lying down, and holding in his hands a fox and a vulture; this, if suspended about the neck, enables the possessor to find treasures. A dove with a branch of olive in its mouth, engraved in pyrites, attached to a silver ring, induced people to feast the wearer much and frequently. The figure of a syren, sculptured in a jacinth, rendered the bearer invisible. A fair head, well combed, with a handsome face, engraved on a gem, gave to the bearer joy, reverence and honour.

During the Middle Ages (and even up to a recent time) antiquities were always objects of superstition. Great earthworks or extraordinary structures were supposed to be the work of demons. Tumuli were guarded by dragons or were the abode of fairies. Ancient vessels needed consecrating before a Christian would dare to use them. Engraved gems were looked upon as magical amulets, and the finders endeavoured to preserve and take advantage of, rather than to dispel the charm. When they became an object of commerce it was the interest of the dealer to enhance their value by the display of their virtues.

GLASGOW ARCHITECTURAL ASSOCIATION.

At the monthly meeting of this Association a paper on "Structural Ironwork" was read by Mr. Andrew Robertson. The "graphic method" of determining strains in frames was first considered, this part being well illustrated by diagrams, and afterwards an indication was given of various ways in which iron might be used constructionally. It was advocated that architects should study mechanics, and familiarise themselves with the use of the material, so that they might with greater confidence carry out new forms of construction. The discussion of the paper was opened by Mr. William Cowie and taken part in by several other members, after which a cordial vote of thanks was awarded to the lecturer.

GLOUCESTER CATHEDRAL.

The annual meeting of the Bristol and Gloucestershire Archæological Society was held last week in Gloucester. After the transaction of business the Cathedral was visited.

The Dean expressed pleasure at meeting so important a body, and asked the assistance of the members in determining the date of the earlier part of the Cathedral, upon which there was a difference of opinion. The date of the crypt and ambulatory was left unsettled, Professor Freeman, who they knew was a good authority, preferring one date, while the late Mr. Gambier Parry, who took a vast interest in the matter and devoted much time to it, fixed another date. There were about seventy years difference between them, one believing that the crypt was built in the time of Edward the Confessor, and the other fixed the date after the Norman Conquest. Mr. Gambier Parry asked him never to give up the earlier date, but he (the Dean) felt if it were possible he should like to have definitely settled the date of the crypt and the ambulatory. Evesham Abbey, which was small, took about seventy years to build, and to say that Gloucester was completed in fifteen or sixteen years was out of all question. He was anxious to have the date decided, and if some member could get up a paper on the subject he should be glad.

The members then proceeded to the choir of the Cathedral, and the Rev. W. Bazeley read some notes on the east window. He said it was composed of two kinds of glass. In one the colour was in thick stripes, and in the other the work appeared as if it had been stippled. The upper part of the window was composed of silvery white glass with the yellow stain. He described the figures represented in the window as detailed by Mr. Winston, and published in many forms. The leading subject of the window was the enthronement of the Virgin, surrounded by our Saviour and angels, saints and apostles. In the tiers below these are figures of kings, ecclesiastics, earls, &c., and beneath these various emblazoned shields erected between 1347 and 1350 by Lord Bradeston, governor of Gloucester Castle, in honour of certain noblemen who had distinguished themselves in the wars in France under Edward III.

The Dean said that Professor Myddleton had written an elaborate monograph of the window, which, however, was not published. He ranked it very much higher than Winston did. It is 72 feet high by 38 feet wide. Its stonework exceeds in size the east window of York Cathedral; it is therefore reputed to be the largest window in the world.

In the lady chapel Mr. F. W. Waller, the hon. local secretary, exhibited large drawings showing the ground plan of the crypt, the floor of the Cathedral and the triforium, in which the casing of the perpendicular masonry of the choir was shown upon the original Norman church. He explained the peculiar architectural features which distinguished the connection of the east end of the choir with the lady chapel, which was erected at a later period. There was evidence that there were Early English windows in the crypt. He showed how the foundations for the later work which was carried up were inserted between the old Norman work. To obtain the enormous window which was desired the two last Norman piers continued from the nave could not be utilised, and two small pieces of masonry were put in, and to meet the thrust from the stonework above, which was required, the builders threw out a number of flying buttresses, so as to allow of the great addition to the choir to be made.

Rev. W. Bazeley read some notes on the early lady chapel. The present building was erected in the last half of the fifteenth

century, but the site on which it stood had doubtless been hallowed by the prayers of the faithful, he believed, as early as the seventh century. On Mr. Waller's plan he traced the line which the Roman wall took prior to the erection of the Cathedral, and referred to the additions and alterations made in the Cathedral at successive dates, as shown by the Early English groining and the reliquary, and the Decorated, Transition and Perpendicular work of the windows, &c. He next called attention to several interesting features in the lady chapel, and pointed out several of the old tiles which were set with modern ones, and with tombstones in the floor. Some of these showed the arms of Llanthony. Referring to the mutilated reredos, he said probably the figures in the niches were of silver. The stonework, which had been beautifully carved and adorned with colour, gilding and enamelling, had doubtless been destroyed at two different times. It was doubtful whether Oliver Cromwell had done so much damage to it as Thomas Cromwell had previously. He thought Oliver often got the discredit due to his predecessor. The present reredos was supposed to have been covered by another reredos.

An examination was made by the members of the lady chapel, and the side chapels with their beautiful fan-traceried ceilings and interesting monuments, as well as other portions of the Cathedral.

THE BORGHESE TREASURES.

THE correspondent of the *Standard* in Rome says he learns from a private source that much ingenuity had to be employed to effect the removal of the world-famous portrait of Cæsar Borgia from the Borghese Gallery. The portrait is attributed to Raphael, though many good judges think it more probably the work of Bronzino. It belonged to the "inalienable" portion of the Borghese Gallery which, according to the "Pacca" Edict of 1820, which has never been repealed, could not legally be taken out of the country. The place of the picture and of three others was altered in the catalogue. When the disappearance of the picture was ascertained Government circulars were sent to the frontier custom-houses, but just too late—the picture had passed the confines.

Some well-known dealers in antiquities in Rome have lately bought two hundred thousand francs' worth of furniture, pictures, vases, &c., appertaining to the *patrimonio libero* of the Borghese family. Several objects have already passed into the hands of a dealer in Florence, the rest will be sold during the coming winter in a building in the Villa Borghese, which has been hired for the purpose by the dealers in question. The famous table in precious antique marbles, supported by a group in gilt bronze, was singled out by a well-known collector, who wished to buy it separately, but the preference was given to the purchasers of the other articles *en bloc*, so it went to them. This table stood in the room of the mirrors in the Borghese Gallery. The heirs of Cardinal Antonelli have sold the famous collection of rock crystals which formerly belonged to Cardinal Giacomo Leperani.

EGYPTIAN EXPLORATION.

ON Monday Mr. Flinders Petrie addressed a public meeting in Manchester on the subject of his work in Egypt. He said that any visitor to Egypt would notice immense mounds of rubbish indicating the sites of towns. It had been thought that they were made on purpose, but they only resulted from the natural decay of the mud-brick buildings. These heaps of ruined walls and earth and potsherds rose even to 80 feet high in some places; but other ancient sites were much less imposing, and might even not attract notice on the open desert. The higher the mound the longer the place had been inhabited; and if the surface was of a late period the earlier parts, which were most needed, were under such a depth of rubbish as to be practically inaccessible. The slighter remains, therefore, which were all of one brief period, were the most important for study, being accessible and not confused with various ages one over the other. Much could be known at first sight, and prospecting had now become as scientific a matter in antiquities as in geology. On first walking over a mound the age of the surface could be known by the series of dated pottery and objects which had recently been collected from known epochs, and which were fully represented in the collections in Owens College. Knowing, then, by a glance at the sherds on the top what was the latest period of occupation of the site, and knowing the usual rate of accumulation of a mud-brick town—about 5 feet in a century—we could guess how far back the bottom of the mound must be dated. Other remains had different indications. If in the midst of a great mound there was a wide flat crater, that was probably the temple site, surrounded by houses which had accumulated high on all sides of it. If a mound had a long gentle slope on one side and steep on the other, it was probably a rubbish heap produced by people walking up one side and shooting baskets of rubbish over the "tip" edge. As to the process of excavation, he said that when a place had been decided on for work the men had to be got together. The best way was to form a camp and have all the workmen kept on the spot; thus each man became well known, his ways and his weaknesses could be noticed and used to the best advantage. The more an excavator kept in touch with all his men the better; the actual digger should be like an extra arm, every one wielded as directly as possible, and all acting as if the head was on the spot. For this end it was needful to give each man an idea of what he was working for, to trace out a building, to find a sculpture, or a tomb, or a town wall. He should be encouraged by a prophecy of what ought to be beneath his feet, and told what to expect, and how to act according to what he finds. This created confidence, and prevented things being ignorantly destroyed if the head was absent. Thus dealing with the men they gained an interest in the work, and became familiar with the meaning of what they found. They were also encouraged by giving every man the local value of all he found, besides his wages. Thus the presents they got as extras gave them the keenest care to preserve everything, and insured that they never secreted things to sell elsewhere. When, moreover, any lie or misstatement was always punished by irrevocable dismissal, they soon learned their own interests. In a short time they lived with the excavators almost like a large family; the few older men served to maintain a backbone. Most of the workers were lads of fifteen to twenty, with smaller boys to carry the earth. Kept continually under one's eye, they learned to come up with all their ailments and troubles, and his meals were generally interspersed with dosing indigestions and lotioning skin complaints. The cheerful, straightforward manner of the Egyptian, when he had no fear and knew that he would always get justice, made it a pleasure to work with them. They formed his guards and companions for months at a time, and he had a sincere liking and regard for them. The tangible results of this work had been before them so long at Owens College that he need hardly say anything about the actual objects found, but rather pass on to what was not yet formulated—the historical results. "The proper study of mankind is man," and whatever led us to know our species better could never be without value. We justly regarded every detail of life in other states of civilisation around us as of the greatest interest. Geographical ethnology was one of the most popular of subjects. And how much more valuable to us must be the history of our fathers, rather than of our cousins—the details of the rock whence we were hewn, the nature of our ancestors, which we have inherited, their products, their arts and skill. The products of their kindred races also, whose arts we had inherited, were of equal importance. A lad who was staying with him asked if he cared for history. He replied, "This is history." "Dear me; well, so it is. I never thought of that," was the answer of the boy. This was history; these objects, these arts—these were real history. What was all cut and dried in black and white was only the skeleton, the set of pigeon-holes for putting by the living history in the memory. In Egypt we now realised what the course of the arts of life had been. In the earliest days yet known to us—about 4,000 B.C.—we found great skill in executing accurate and massive stonework, such skill as had hardly ever been exceeded. We found elaborate tools used, jewelled saws and tubular drills. We saw the pictorial arts as fully developed as they were for thousands of years later. But what led up to this we were still feeling for.

Professor Boyd Dawkins moved a vote of thanks to Mr. Flinders Petrie for his address, which had shown, he said, what a vast department of human knowledge was to be explored by the intelligent operation of the pickaxe and the shovel.

Mr. H. H. Howorth, M.P., in seconding the vote of thanks, said that Mr. Flinders Petrie had made two remarkable discoveries. One was of a purely negative sort—he had dug a great deal in Egypt and failed to discover the beginnings of Egyptian art. In Egypt Minerva and all her train seemed to have appeared on the horizon fully equipped. The objects in wood and other material which had been discovered in Egypt showed an artistic skill equal to that of the most artistic race now living. But nothing had been found to show by what steps this perfection had been reached. The discoveries with which the name of Mr. Flinders Petrie would always be associated had thrown an enormous amount of light on the chronology of the art of the Eastern Greek world.

Professor Wilkins, as one of the local secretaries of the Egyptian Exploration Fund, said they would be glad to receive contributions in aid of the important work being carried on by the Society under the direction of Mr. Petrie.

Mr. Hoyle, curator of the Museum, said that a number of new objects had been added to the Egyptian Room, which had been found during the explorations last year. These would be in their places by the beginning of next week, and in the meantime the Egyptian Room was closed. Among the new things are some pottery which dates back to the Fourth Egyptian Dynasty—about 4,000 B.C.—some fragments of sculptures and a bronze implement.

SCHOOL BUILDINGS.

Carlisle.—The infant school erected in Brook Street for the Carlisle School Board has been opened. The buildings have been erected under the supervision of Mr. T. Taylor-Scott, F.R.I.B.A., the architect, with Mr. J. D. White as clerk of works. They present a handsome feature in the locality, the design being Gothic, with a well-broken outline and numerous gables and dormers, and being crowned with a large ornamental spire constructed on the ridge, and rising to a height of 60 feet above the ground. The material used is red Cumwhinton bricks and white stone dressings with Buttermere green slates. The contractors were :—Builder, Mr. John Laing ; joiner, Mr. J. H. Reed; plumber, Messrs. W. & R. M. Hill; plasterer, Messrs. R. M. Ormerod & Son ; slater, Mr. C. J. Nanson ; concrete floors, Messrs. S. Ferguson & Sons ; painter and glazier, Mr. Thomas Palmer ; furniture, Mr. J. H. Reed.

NEW BUILDINGS.

Blackburn.—The erection of the Nurses' Home behind the Blackburn and East Lancashire Infirmary will shortly be commenced, for the Building Committee have accepted the design of Messrs. Simpson & Duckworth, from plans from architects practising within the district served by the charity. The building will be of red brick, three storeys high. The ground plan shows a building consisting of three parallel blocks, connected by a corridor which runs through the entire structure. The main entrance to the home will be by a porch in the central block, and there will be a waiting-room on the left of the entrance-hall. Across the corridor, and at the other end of the block, will be the reading-room. In the same block will be the home sisters' sitting-room, and next to it will be the home sisters' bedroom. In the wing on the right will be the kitchen, scullery, box-rooms and the usual conveniences. The wing on the left will be entirely taken up with bedrooms and a bathroom for six private nurses. On the first floor there will be six bedrooms and a bathroom in the right wing for probationers, and in the left wing the same number of bedrooms and a bathroom for charge nurses. The central block will be taken up with a recreation-room. On the second floor there are to be bedrooms for six probationers in the right wing, and for six night-nurses in the left wing. In the centre will be placed the servants' bedrooms, another spare room, and a clothes-room. The architects' estimate of the cost is made up as follows :—139,950 cubic feet of building at 5½*d.*, 3,207*l.* ; cellar, 80*l.* ; foundations, 90*l.* ; covered way, 100*l.* ; total, 3,477*l.*

Durham.—A new theatre, concert hall and assembly rooms have been opened in the North Bailey. The theatre will accommodate about 700 persons. The stage is 22 feet by 17½ feet in dimensions, and in addition to the theatre itself there is a large supper or smoking-room, cloak-rooms, lavatories, dressing-rooms and other apartments. The building contains also large kitchen with pantry, cellars, caretaker's rooms, &c. The whole of the arrangements have been carried out by Mr. William Rushworth, architect, of London, brother of the proprietor. Messrs. G. Gradon & Sons, Durham, were the contractors.

Correspondence

Somerset House.

Sir,—I have been anxiously waiting for some one of eminence or influence to raise a protest against the vandalism of the authorities who are erecting at Somerset House the hideous enormity which is now spoiling the river façade of that noble building. I deeply regret that the complaint I thus initiate is not guided by some more influential pen, but in the absence of other protest I cannot remain silent. There is no finer urban prospect, there is no nobler architectural panorama in Europe than the line of magnificent buildings (seen best from the southern end of Waterloo Bridge), having Somerset House as the centre, and including the beautiful Gothic of Arundel House and of other buildings on the Duke of Norfolk's estate, the central offices of the London School Board, the Temple Library, Barry's characteristic structure in the Temple Gardens, Zion House and the City of London Schools. One after one these worthy buildings follow each other without a break, full of actual beauty, and stirring other builders to noble endeavour. Beyond them, but well in the prospect, are more distant glimpses of the pinnacles and towers of the Royal Palace of Justice, whilst many a spire and many a steeple rise from the haze above the roofs of the City until the view is crowned by the stately dome of great St. Paul's. On turning to the west, we see building after building of at least respectable merit, bounded at last by the towers of Westminster.

It is in the very heart of this grand view, unequalled in Paris or Vienna, and which even bears favourable comparison with the finest perspectives in Venice or Rome, that some barbarian (I know not who) is raising two monstrosities for some branch Governmental department, in the commonest brick, without the least appearance of ornament or design, and utterly devoid of architecture of any kind. To my mind the river front of Somerset House in its beautiful stone and stately style presents one of the most dignified aspects of any building in London. That there should be additions to this historic edifice in ugly common brick (above the sky-line), additions which have no relation whatever to the style or proportions of its parent building, is an emphatic disgrace that we must not, and cannot, permit.

If such an eyesore be allowed to blot what is unquestionably the most magnificent architectural prospect in Northern Europe, alas ! for all lovers of the beautiful ! Let our cities be abandoned to the jerry builder and let architects cease to aspire. The very numerous workmen who have laboured to raise upon the Thames Embankment buildings worthy of their manhood have laboured in vain.—I am, Sir, yours truly,

T. Mullett Ellis.

28 Essex Street, Strand, London :
October 14, 1891.

GENERAL.

The Autumn Exhibition of the Nineteenth-Century Art Society will be opened at the Conduit Street Galleries on Tuesday, the 27th inst.

An Altar, designed by Messrs. Pugin & Pugin, of Westminster, has been placed in the church of the Sacred Heart, Mount Vernon, Liverpool.

The late Mr. W. H. Smith was, it appears, the anonymous donor of 28,000*l.* for the erection of Portsea parish church, only 500*l.* of which he sent in his own name.

Plans for the proposed public baths at Montrose to the number of eighteen or twenty have been sent in by architects from various parts of the country.

The Architectural Class of the Glasgow and West of Scotland Technical College have begun a series of visits for measuring and sketching in Glasgow Cathedral under the direction of Mr. C. Gourlay, Associate of the Institute of Architects.

Plans have been adopted by the Council of the Yorkshire College for the proposed college hall and library and for the new medical department, at an estimated total cost of nearly 50,000*l.*

Mr. James Maxwell (Maxwell & Tuke, architects), the designer of the Blackpool Tower, has been appointed Justice of the Peace for Bury.

Mr. Guy, of Southsea, whose designs were selected in competition for the proposed new library buildings at Southampton, has been authorised to complete his plans and prepare specifications for the work.

Plans submitted in competition by Mr. H. B. Buckley, of East Parade, Leeds, for Technical Schools, Batley, have been selected, and the work is to be carried out at once.

The Foundation-Stone of the Sheffield Municipal Buildings, of which Mr. Mountford is the architect, has been laid.

Mr. William Dunn intends to purchase an open piece of ground at the top of St. Mirren Street, Paisley, at a cost of 4,000*l.*, and lay it out as a public park.

The Wolverhampton Town Council, in recognition of his services to the borough, have decided to ask Mr. H. H. Fowler, M.P., to let his portrait be painted and hung in the Council Chamber, and, further, to allow the Corporation present him with the freedom of the borough.

New Schools have been erected at Burnley Wood for the Burnley School Board, and special attention has been paid to the ventilation, the appliances of the "Climax" Ventilating Company, 15 Great George Street, Westminster, having been adopted by the architect, Mr. G. E. T. Laurence, A.R.I.B.A., of London.

The Engineers and Architects' Institute of Vienna have resolved to petition the Austrian Government that engineer attachés should in future be appointed to the embassies and legations in London, Berlin, Paris, St. Petersburg, Rome, Washington and to one Oriental city to be hereafter selected.

Three Colossal Statues, 10 feet in height, of rose granite, have been found at Aboukir, a few feet below the surface. The discovery was made, says the *Times* correspondent, from indications furnished to the Government by a local *savant*, Daninos Pasha. The first two represent in one group Rameses II. and Queen Hentmara seated on the same throne, which is unique among Egyptian statues. The third statue represents Rameses standing upright in military attire, a sceptre in his hand and a crown upon his head. Both bear hieroglyphic inscriptions, and both have been thrown from their pedestals face downwards. Their site is on the ancient Cape Zephyrium, near the remains of the Temple of Venus at Arsinoe.

The Architect.

THE WEEK.

France possesses eighty-seven cathedrals of which the conservation devolves on the Government. They were formerly under the charge of seventy-five diocesan architects, who were selected by the Ministers; but of late years there are only sixty employed. Since 1884 the vacancies among diocesan architects have been filled by the aid of competitions, and it is the endeavour to secure architects who are zealous for Gothic. As the style is no longer in vogue, the number of competent candidates is being gradually diminished. The office is not attractive on account of its emoluments. As a rule, the Chamber does not vote more than two millions of francs a year for the restoration of the cathedrals. A commission of 5 per cent. on that sum would produce 4,900*l.*, or about 66*l.* for each architect, a sum which is far from being remunerative for such onerous responsibility as has to be undertaken. The position is, of course, a token of ability and worth, and on that account becomes valuable in a country such as France, where officialdom is respected. Accordingly, in the competition which has been held for six appointments, twenty-six candidates were nominated, but only ten appeared. The examiners were MM. de Baudot, Vaudremer, Corroyer, Bœswillwald, Darcy and Pascal, architects who are associated with the Department, with M. Dumay as president. As a test, it was supposed that some church, belonging to the period between the eleventh and sixteenth centuries, was partially destroyed by fire, and the competitors were to describe fully the restoration proposed. Each competitor was to select a church with which he was acquainted, in order that the projects might not be altogether imaginative. The following architects were selected:—MM. Benouville, Marcel, Roy, Laffillée, de Perthes and Balleyguier. As there are only two vacancies at present, M. Benouville and M. Marcel were appointed, the others will follow in succession.

The Yorkshire College has been enriched by grants from the Leeds Borough County Council, and in consequence extraordinary facilities for education in industrial subjects are now available for students. Instruction in technical electricity is to be obtained by paying 10*s.* 6*d.* for lectures and 1*l.* 10*s.* for a laboratory course. Free courses of lectures are also to be given, and among the subjects are "The Use of Plant Form in Design," "The Principles of Design" and "Textile Design." There is also a course on "Sanitary Engineering." Fifty evening scholarships of the value of 2*l.* each are also to be offered in competition. When are the humbler classes of students in London to have similar opportunities?

The annual meeting of the Glasgow Institute of Architects was held on Tuesday, when the Council submitted the twenty-third annual report, which showed that the number of ordinary members on the roll at present stood at forty-nine, and there were eight honorary members, making fifty-seven in all. Mr. Leiper, in moving the adoption of the report, said he was sure there were members of the profession still outside who might be induced to join the society. He regretted that the proposal that the Institute should have a home of its own had not found favour with the majority, but they did not despair of its being accomplished. The Institute did not support the application of the Society of Architects for registration, as they considered that the Royal Institute already fulfilled all that was needful. Touching on the education of young architects, he remarked that a distinct advance had been made in this respect, and of four local candidates who went up for examination recently three had passed. After referring to the Building Act, to assist which the Institute prepared a draft Bill and forwarded it to the Clerk of Police, Mr. Leiper referred to the important architectural project in which they were interested locally, namely, the new Fine Art Gallery, Museum and Music-hall. A school of design under the same roof would be an immense advantage, as the objects of art sent from South Kensington and elsewhere could be conveniently studied. Referring to the growing use of red stone and terra-cotta in Glasgow buildings, he said this was rather remarkable in a city where formerly only white stone was tolerated. No doubt the reason was that hardly any of our white stones would stand an atmosphere laden with acids and smoke, while it was found that as a rule the red stone resisted more effectually the deleterious effects of the town atmosphere, and that white stone after a time became a dismal black. He thought that some better method of preserving the white stone should be resorted to than painting them. In Paris hot jets of steam were used once a year to clean out the soot and dirt which gathered on the fronts. That there was no committee of taste in Glasgow was due to the fact that beauty must give way to utility, which with its iron plough overturned the fine flower of architecture and destroyed vistas and fine parks and gardens.

Is it a ruse which inspires so many versions of the sales in the Borgia Gallery at Rome? According to some authorities the contents of the gallery remain unaltered, as the Duke de Romarzo has too much reverence for the Commission of Fine Arts to infringe the regulations against sending works of art out of Italy. Then it is stated that the Duke has certainly sold a portrait of Cæsar Borgia for 24,000*l.*; while according to another account it was the Duke's son who was the vendor, and the picture sold is not a portrait by Raphael, and does not represent the wicked prince that was idolised by artists and poets. In that case, as it is not an object of exceptional value, it does not come under the terms of the Pacca edict. There is no doubt the pictures are not visible to strangers, but this is explained by saying that they are about to be removed to another part of the palace, owing to the dampness of the gallery in which they were hung. The statements cannot all be true, and before they are reconciled it is not impossible that some of the masterpieces may have to be conveyed out of Rome and towards Paris, in order that they may be secure against atmospheric and other dangers which menace such works.

The Brown Book of the Architectural Association for the present session is a thicker volume than its predecessors, on account of the syllabus which is included. There are several changes recorded, and there are other signs of the new experiment. The following papers are to be read during the session:—"Pitfalls on commencing Practice," Mr. W. H. Bidlake; "Frame Houses," Mr. C. H. Brodie; "Concerning John D. Sedding, his Work and Influence," Mr. H. Wilson; "Some Suggestions for the Practical Education of an Architect," Mr. T. G. Jackson; "The Design and Equipment of Technical Schools and Colleges," Professor Garnett; "Fashion in Architecture and Art, with Remarks on its Effect on Mural Painting and Painted Glass," Mr. N. H. J. Westlake; "Suggestive Domestic Work seen in past A.A. Excursions" (with lantern illustrations), Mr. Maurice B. Adams; "Domestic Electric Lighting," Mr. Max. Clarke; "How they Built in Shakespeare's Time" (with lantern illustrations), Mr. J. Alfred Gotch; "The Planning of Theatres," Mr. E. A. E. Woodrow. The work of the Association will be carried on at 56 Great Marlborough Street, with the exception of the general meetings, which will be held at 9 Conduit Street.

Although the Luxembourg Palace in Paris dates from the beginning of the seventeenth century, the chapel was not completed until 1844, under the Government of Louis Philippe. The chapel has remained unused since the Republic was established, but it is about to be reopened for service. It has been assigned to the Maronites, and as the Greeks have obtained possession of the church of St. Julien le Pauvre, there will be two of the semi-independent branches of the church of Rome worshipping in the same district of Paris. In the church are several large paintings by the modern masters Jean Gigoux, Vauchelet, Abel de Pujol, and sculpture by Jaley and others. The works have been cleaned and restored where necessary, and it is expected the chapel will appear bright and cheerful.

THE RIVER, FROM THE CUSTOM HOUSE TO RICHMOND; OR, A CHAT ABOUT SOME BRIDGES.—III.

[By a Correspondent.]

AFTER passing by Wandsworth Bridge the lovely grounds of Hurlingham House come in view, and then one sees that most useful and convenient railway bridge at Putney, which enables the dweller in the western suburbs to readily obtain access to the rural neighbourhood near Wimbledon. Would that this structure were more in harmony with the surroundings, such as the fine elms on the Middlesex bank! But it would be as wise to talk to the winds as to endeavour to persuade a railway company that it is advisable to study the beautiful as far as possible. For the dividends are not affected because an ugly bridge or viaduct spoils a pretty view and is an eyesore to its immediate neighbourhood. The value of some land near by may be diminished, but, on the other hand, in consequence of the convenience of access, plots near the station become more sought after and are soon occupied. This Putney railway bridge is of much the same character as the road bridge at Wandsworth, *mutatis mutandum*, and is carried on huge piers. There is really not much more to be said about it, except it is rather irritating that, owing to the arrangement of the lattice girders, no one can get a good view of this interesting part of the river. However, this is better than at the Britannia tubular bridge, Menai Straits, or the Conway railway bridge, where all is darkness. In the old-fashioned structures the view was always quite uninterrupted.

There could scarcely be a greater contrast than the new bridge at Putney and the old one it superseded. As a rule the antiquary must lament the destruction of objects of the past. But in this instance there was in truth nothing very picturesque in this old timber erection, except possibly the cut-waters, which, being carried up the whole height of the bridge, also offered an agreeable place to the lounger. But, being of Baltic fir and not of English oak, it had none of that pleasing grey hue matured by long exposure to the weather. This bridge always gave the impression of having been originally intended for temporary use, and afterwards being allowed to stand, thus acquiring the status of a permanent structure. When first the writer saw the new bridge on a bright day in August, soon after it had been opened for traffic, the grey granite looked almost dazzling, but since that short period the gentle hand of Time has already subdued it to a more sober tint. There are three bold arches of considerable span, with a pleasing rise in the centre, though withal an easy gradient for the traffic, and a good proportion of simple parts. Not much more can be said of the design, for it needs no lengthy description any more than does London Bridge. Good materials, much ability of construction—such are the elements to tell in a bridge. But it is a pity to run a risk of "spoiling the ship for a ha'porth of tar." The small semicircular arches in the approaches on both the Middlesex and Surrey side are of ordinary stock-bricks. This cannot very well be "built out," and the only thing to do would be to let the ivy grow; at present the effect is decidedly bad.

And now for "the other side of the shield." The writer on the particular occasion when he had been admiring the elegance of this Bazalgettian structure, strolled by the evening sunlight along the towing-path on the Surrey side by the grand semicircular sweep of the Thames past Barnes Elms to the suspension bridge at Hammersmith. In this example some of the sins of the civil engineer, architecturally speaking, are exhibited. Cast-iron legitimately treated to suit the material, and not as if it was masonry, can, of course, be made to look well. But the immense piers here have very large capitals of a kind of Early English character. Above them we see a species of turret from which the heavy chains with their great bolts are hung. The arrangement of the footways for passengers is unusual, as they are entirely separate from the carriage-roadway, slung out on one side from the chains. The construction of suspension bridges is particularly interesting, because, unlike the hideous box-girder railway bridges, nearly everything is visible and can be studied. The theory of the earlier revivalists of Gothic architecture is now almost extinct, *i.e.* that all construction should invariably be shown, never mind if it were ugly (and therefore better veiled) or elegant. This was, of course, "riding the hobby-horse too hard." To conclude with this bridge, the balustrade is on the latticework principle, and the masonry piers below the roadway are continuous transversely.

After this bridge it is not to be wondered that there is a longish interval before the next, looking at the surroundings of the river and the sparse population on its banks, though that is not the case for very far. The next is for the South-Western Railway, at Barnes, so useful for those who want to witness the finish of the University Boat-race, and have the privilege of standing there while the trains cease to run. It seems almost malicious to say that those who are on it then do not miss much from not seeing its artistic features beneath, which may be called *nil*. But there is nothing whatever objectionable or offensive in the design. It is very plain; the upper part of the piers of ordinary stock bricks, which do not seem to do well in such a position. There is an arched iron construction of the usual type of railway bridges of the period when this structure was completed, and the spandrils are pierced, having simply vertical semicircular-headed panels. The balustrade forms no feature, having a solid front and nothing to show where it begins and ends, looked at externally.

The next bridge is for the South-Western Railway, between Gunnersbury and Kew Gardens. This is one of the usual type for such purposes, and calls for no particular comment. It is plain, but not ugly, because no attempt at so-called ornamentation has been made. At the same time, one cannot but wish it were possible to design railway bridges on some principle which would be satisfactory to the shareholders and also give a more pleasing picture to the eyes of the ordinary members of the public. New inventions come in so quickly now that it is not impossible this wish may be fulfilled ere long.

The old bridge at Kew is so quietly picturesque and so familiar to the lovers of the Thames that its threatened destruction to meet the exigencies of the constantly increasing traffic, and the proposal for a new structure to take its place, is greatly to be lamented. Even though its successor were as well designed as the new Putney bridge, it never could have the charm of the present one, except possibly to our great-grandchildren. As the steep gradient is one of the great objections to Kew Bridge, the mere widening of it would not be acceptable, and, for the reasons stated at the commencement of this article, would to some extent injure its effectiveness, architecturally. To build another bridge near by, irrespective of financial and other practical reasons, would also damage the old structure from an artistic point. A tunnel would be too costly, and not be popular, independent of the expense and difficulty with the approaches. The only possible way to preserve the bridge would be to rebuild it on some other part of the river not far off, where the traffic was not so great. This would not be more unreasonable than was the transportation of Temple Bar to a private park. One of the attractive features of Kew Bridge is its seven arches, an unusual number. The steep rise up to the centre is also pleasing to the eye. The central arch has a keystone; not so the others. Whether this was or was not so originally is immaterial, for the centre is not unfittingly thus marked. The main piers carrying the bridge are quite plain in the lower part, but have simple panels at the parapet level, and there are other subsidiary piers to the balustrade. The balusters individually are somewhat slight looking, but their general effect is good.

Passing the picturesque old buildings adjoining Kew Gardens, then Sion House and the quaint houses at Isleworth, the South-Western railway bridge at Richmond comes into view. This is of much the same type as that at Barnes, with massive piers below where the iron arches spring, and stock brick above that level. The spandrils are pierced, but the parapet not so; it is quite plain.

The last example to be commented on by the writer is that one so familiar to most Londoners, but which always seems fresh—the old bridge at Richmond. This differs from its sister bridge at Kew in having only five arches instead of seven. The rise of the roadway in the centre is also not so great, and the parapet is straight-lined at the top, a very obtuse angle in the centre being thus formed. The piers are bow-shaped, the bow being rather a flat one,

with a small square pier on either side, to form a re-entering angle into the main part of the bridge, which is a great help to the effect. Unless projections on a plan based on the circle are semicircular they look poor, and where it is impracticable to get that, the scheme adopted at Kew is an excellent one. As these piers are carried up the whole height, they are useful in forming little recesses for foot-passengers, largely used in such a situation, where the prospect is so cheerful and in every way beautiful. The balusters to the bridge parapet are of rather rustic design, not by any means brilliant specimens of "Roman" work, but that is not material where the general effect of the design is pleasing. On the Surrey side the appearance of the balustrade near the bank has been rather injured, owing to the level of the roadway having been raised and the parapet also, on the inside, leaving the original raking line externally and the balusters "engaged." This was clearly done for the convenience of the traffic, avoiding what was formerly a slight dip in the road leading into the main street of Richmond.

It has been a very pleasing occupation to the writer to jot down his impressions of these various bridges from the Custom House to Richmond, and he trusts that as an architect he has said nothing ill-natured to civil engineers in these candid criticisms on what is a subject of public interest. Would that it were practicable to have an architect called in for consultation before a design for a bridge was finally adopted, or some such arrangement as existed between Mr. Haywood, the City engineer, and the late Sir Horace Jones, in respect to the Holborn Viaduct and the Tower Bridge, where the good effect of the employment of an architect, in combination with an engineer, was very apparent. For bridges over a large powerful tidal stream, like the Thames below Teddington, the skill of a member of the last-named profession is no doubt required, and it would be absurd at the present time for the architect to claim the building of such structures as his prerogative. Yet it seems a pity he could not be permitted to have some little share in the artistic part, leaving the civil engineer to grapple with the main constructional difficulties.

FRANCESCO ALGAROTTI.

WHENEVER Mr. Carlyle expends his verbal wealth in blackening the character of people, it is generally wise to avoid accepting what he says without further examination. Although he is never more amusing than when employing his pen on that sort of work, he was not on those occasions in a condition to do justice to anybody, living or dead, against whom he had the slightest grudge. His intentions were generally honest enough, but a man who, while he believes he has a mission as a saviour of society, is compelled to suffer from a diseased liver and a hypochondriacal wife, like the commonest mortal, cannot always be expected to be in an equitable state of mind. When Carlyle was bilious anybody's reputation might suffer. In the case of Algarotti, there were two or three reasons to embitter his mind against a man who had ceased to affect the world for more than a century.

In the eighteenth century there was no more acute connoisseur in all that relates to the fine arts than Algarotti. He was inflamed with that "worship of the beautiful" which Carlyle considered to be an intolerable hypocrisy—nay, "doubly intolerable, because it is not an obliged hypocrisy, but a voluntary one." Algarotti, who was one of the last of those who took all knowledge for their province, besides the treatises on military art, the Newtonian theory, philology, politics, and other subjects, in his seventeen volumes, did also, as became an Italian, write upon architecture, sculpture and painting, and for displaying a love of art so openly he became obnoxious a century afterwards to Mr. Carlyle. His prejudice against Algarotti was expressed in his "Frederick the Great," when he wrote:—"To me he is not supremely beautiful, though much the gentleman in manners as in ruffles, and ingeniously logical: rather yellow to me, in mind as in skin, and with a taint of obsolete Venetian macassar. But to Friedrich he is thrice dear; who loves the sharp-facetted cut of the man, and does not object to his yellow or extinct-macassar qualities of mind."

This passage reveals the second reason for Carlyle's manner of judging Algarotti. It is evident from what he says that he was jealous of the influence which the Italian possessed long before at the King's court. Biographers are often subject to that strange sort of delusion; and, moreover, Carlyle must have felt that if Frederick were living in London he was not likely to pay many visits to Cheyne Row, and would prefer the society of the *dilettante* person who "pleased him beyond measure," of whom he declared there was no human creature comparable with him, although nature gave him "a big hook nose, and dusky, solemnly greedy countenance," and for whose genius he would willingly give "ten cubic leagues of ground." But intimate as he was with the King, he did not divulge much about Frederick's private life or conversations, and accordingly he left no materials which an historian could turn to account. It is no wonder, therefore, Carlyle did not love a man who let slip so many opportunities for recording the tittle-tattle of the Court. Another reason for the treatment of Algarotti arose from the exigencies of composition. Carlyle, who was a master in arranging contrasts, wished to enhance his hero's manliness by surrounding him with people who were not possessed of the first qualification for a soldier. It is therefore suggested that Algarotti was a coward, and from that defect many others issued.

As Carlyle is the only writer of note of late years who has given any attention to Algarotti, it is well to suggest that what he writes is not an impartial sort of judgment. Any of the books which bear the Italian's name will show that, with all his love of art, he was not deceitful, or of the windbag species. In England there is an obligation to think kindly of the courtly and learned gentleman that was known in Frederick's court as the Swan of Padua. He was one of the few foreigners of his age who admired Englishmen. In an address to the Society of Arts, a couple of years before his death, he placed the English on the same level with the ancient Romans. England, he said, could claim superiority in arts, arms and science, as well as in agriculture and architecture, the two arts which most contribute to the strength and splendour of a State, one being the sovereign of the polite arts, the other their nurse. He also assumed that the art of painting, which, in 1762, was exciting much interest (the first exhibition was held in 1760), would flourish in London as formerly in Parma, Venice and Rome. There are few examples of such genuine admiration for England as is to be found in Algarotti's books and letters. His sanguine views about the future state of art in this country was contrary to the dicta of the critics of that age.

In another way Algarotti was in advance of his contemporaries, and that was in advocating a system of education for artists that differed from what was followed in the eighteenth century. His principles will be suggested by glancing at that part of his teaching which related to painting.

He started with a suggestion that should have recommended him to Carlyle above all men. Algarotti believed that the individual should succumb to the State, and that it was the business of government rather than of parents and guardians to settle the course of life which children should follow. The selection was not to be made in a haphazard fashion, but by means of able men who were to visit the public schools and observe the tendencies of the students. Children who were considered to have qualifications for painting were to be at once placed in training. The only books used for reading lessons were to be biographies of artists. In the earliest drawing-lessons the finest examples were to be set before the children, in order that from the beginning the students should be impressed with the importance of beauty. Algarotti was opposed to a long course of copying from drawings, and he recommended that Greek and Roman models should be substituted at an early stage for the sake of the fine contours and in order that the necessity of light and shade should be impressed on the mind. Whatever kind of exercise was adopted, the student was to be made to go through it carefully, but at the same time he was to be induced to find pleasure in his work, for Algarotti, like Macbeth, believed that "the labour we delight in physics pain."

A knowledge of anatomy, as far as regards the bones

and muscles, was also insisted on as indispensable for the student. The casts of the figure by Hercules Lelli were recommended, but Algarotti suggested that it would be an improvement if different colours were used for the muscles, in order that those in the arm, back and elsewhere should not be confused. One of the exercises recommended by Algarotti was the taking of part of a figure, such as the thigh of *Laocoon*, and to follow out the action of the muscles by completing the leg. He believed that the safest course to follow in the arts was from theory to practice, and this faith inspires whatever he wrote about anatomy and perspective.

It might be said that the love of ancient work was an essential part of his theory. To Algarotti Greek sculpture was perfection, and the *Apollo of the Belvedere*, the *Laocoon*, the *Venus Medicis*, the *Faun* and the *Antinous* afforded canons of art for the painter. He maintained that new beauties were to be discovered in them as often as they were studied. That the Greeks were not as successful as Fiammingo in representing very young children, which was a belief among Italian painters, was taken by Algarotti to be evidence of their love of beauty. Until children reached the age of four or five years their contours and proportions were not considered as definite, and on that account the Greeks avoided them as subjects.

He upheld the necessity of every painter possessing some such ideal figure in his mind as Raphael professed always to have before him. Algarotti, therefore, was opposed to the practice of copying the nude by young students. He would keep them back until it was shown they possessed some acquaintance with symmetry and proportion. If he were living now he could point to many deviations from the right way in support of his theory. The endeavour to produce most realistic representations of models has caused many men to imagine that art is no more than the record of defective forms, and that nature is to be typified by a human frame that cannot reach its full development on account of social grievances. There is not a school or "ism" in France which has not originated in life studies, and in the setting up of individual peculiarities as superior to idealised forms.

His studies of Newton would be enough to make Algarotti a student of the mysteries of colour and to recommend a scientific study of the phenomena. But with all his attention to the prism, he maintained that science must yield to art, and that Giorgione and Titian discovered appearances which to others were concealed. The works of Titian could not he said be too much studied. In the eighteenth century there was a turning to nature as the only guide in all things, and this is seen from the earnestness with which Algarotti recommends the use of the *camera obscura* for painters. He says the best painters in Italy were then employing it, and that the success of Spagnoletto, of Bologna, was to be ascribed to it. One master said that an academy could be set up and flourish with the aid of a *camera obscura*, a copy of Da Vinci's "Treatise on Painting," a critical account of painters, and a few casts of Greek statues. The advantages of the *camera obscura* are no longer appreciated by painters, but it would be unfair to blame the men who in the eighteenth century prized it. At a time when pictorial landscapes were made up of conventionalities it was well to have something brought into use that was a true reflection of a real scene. Even Gainsborough, who was a lover of nature, was so much a slave to the practice of composing landscapes, that he "framed a kind of model of landscapes on his table composed of broken stones, dried herbs and pieces of broken glass, which he magnified and improved into rocks, trees and water." In his case those objects may have recalled scenes in the country, but there were landscapists who seemed to be above thinking of nature. For men of that class the *camera obscura*, which the Italians claim as an invention of Leon Battista Alberti, would be corrective and a stimulant to a proper mode of study.

But it must not be supposed that "the ingenious and able Algarotti," as Macaulay describes him, was an advocate for the direct reproduction of a landscape by the aid of an optical instrument. He always insisted that the business of the painter consists in the endeavour to produce probable scenes and not scenes that are exact copies of reality. The painter, like the poet, should have imagination and know how to exercise it. The ancient painters on that account were more happy than modern men, for, as Algarotti pointed out, the world was supposed to be filled with gods and goddesses, fauns and nymphs, tritons and nereids, who took part in human affairs. The Greek painter, although "suckled in a creed forlorn," could have those glimpses which Wordsworth longed for, while living amidst the mountains—the "sight of Proteus rising from the sea" and other delightful scenes. There was no system of ethics which enjoined mortification of the senses, and whatever he saw and which gave him delight he was able to depict without fear of present or future punishment. It was impossible to bring back Classic days, and as the best substitute Algarotti recommended painters to study the Classic authors and the poets, in order to excite their imagination. He points out how Michel Angelo earnestly studied Dante, and on the margin of his volume drew illustrations of the scenes, thus making it inestimable, and worthy of the library of the greatest monarch.

In fact, Algarotti expresses the principles which were followed by the greatest artists, and to condemn him as if he were only a Frenchified *beaux esprit*, as has been done by his countryman Gioberti and many others, is to say that the history of art in Greece and Italy is only a delusion. He was no formalist with a series of technical rules, and he certainly was free from any superstition of style, unless his admiration of the Greeks and the great masters of Italy could be so termed. His ambition was to raise his countrymen out of the depths of mediocrity, and if he failed his efforts merit respect.

THE IMPERIAL MUSEUM, VIENNA.

THE new Imperial Museum of Art, in the Ring Strasse, Vienna, opposite the old Palace of the Hofburg, opened by the Emperor, is, in its external aspect, says the correspondent of the *Standard*, an exact counterpart of the Natural History Museum opened last year, from which it is divided by a spacious square, in the centre of which stands the Maria Theresa Monument. The edifice has been in the hands of Baron Hasenauer, the architect, for no less than sixteen years, though, like the corresponding museum, it has been externally finished for the last ten years. The interval has been employed on the decorations of the interior, of whose lavish richness and beauty probably very few people have any idea, unless they have visited the building, which was opened last year.

Every sculptor and painter of note who has lived in Vienna for the last ten years has been employed, more or less, in assisting in the embellishment of this Museum of Art. The late celebrated Austrian artist, Herr Makart, is well represented in the works of art which adorn the walls and ceilings of the Museum. The Hungarian painter, Herr Munkacsy, has a painting on the ceiling in the great entrance hall, representing the apotheosis of Art, which forms one of the principal attractions of the building. This picture was painted on one piece of canvas, woven especially for the purpose, and so large that the painter had to have a special house built to enable him to work on it. Opinions differ as to the correctness of the painting in point of perspective when looked at from below, but he who only knows Munkacsy from his other paintings will hardly recognise him in the bright and joyous light in which he has here represented Italian art.

The entrance-hall shows another celebrated work of art, to wit, Canova's marble group of *Theseus and the Centaur*, which for many years stood in a special Greek temple in the Volks Garten here. On its removal to this Museum last year it unfortunately suffered serious damage from the clumsiness of the mode of transit. This group stands on the first landing of the grand staircase. The dimensions of the entrance-hall may be gathered from the fact that this immense group by Canova appears dwarfed to only a medium size. The ground floor to the right and left of the entrance-hall leads to the collections of Roman, Greek, Mediæval and Renaissance antiquities, to the Egyptian Museum, to the collection of Greek vases, antique bronzes, cut stones and coins, and to the very important collection of objects of old art industry, altogether occupying thirty-nine large rooms. In the basement are the celebrated Princes' Tombs, with unique reliefs, found in Lycia, in Asia Minor.

The principal part of the Museum is, however, the first floor, with fourteen very large and nineteen smaller rooms. They are on either side of the splendid circular hall that is surmounted by a lofty cupola. The first floor contains the Imperial Picture Gallery, with 1,735 old masters and about 300 new masters. With the exception of about 150 old masters, including paintings by Titian, Veronese, Velasquez,

Rubens, Dürer and others, for which no room could hitherto be found, and which had till now been hidden away, all the works in this collection are well known and, indeed, famous throughout the world as the former gallery of the Vienna Belvedere.

It is hardly possible to describe how greatly the numerous celebrated pictures of this gallery—for instance, the Rubens Collection—have gained in colour and effect by their new surroundings. The splendid roof-light is common to all the central halls, while the smaller rooms on each side have side lights. These collections will be thrown open in a fortnight hence, from which date the public will be admitted four times a week free of charge.

The second floor has twelve rooms, containing a very fine collection of water-colours from the various Imperial palaces. Very few people in Vienna had any knowledge of the existence of these works. The Museum will altogether unite what has hitherto been scattered all over the city, including the Belvedere Gallery, the Ambraser Collection, the Imperial Armoury, and the larger part of the celebrated Wiener Schatzkammer in the old Hofburg. In addition to these, whatever was found in the Imperial palaces and castles throughout Austria worthy of a place has been included with these better-known collections.

All the contents of the Art Museum, as well as the Natural History Museum, together with the buildings themselves, are the private property of the Emperor, who, by help of munificent grants from his Civil List, is every year adding to the already very rich collections of the Imperial house.

REGISTRATION IN MELBOURNE.

THE following is a draft outline of the Bill for the registration of practitioners in architecture, which it is proposed to introduce in the Victorian Parliament :—

Whereas it is expedient that provision be made for the registration of persons qualified to practise as architects in the Colony of Victoria. Be it therefore enacted, &c.

1. A Council shall be established styled "The General Council of Architectural Education and Registration of Architects entitled to Practise in Victoria," hereinafter referred to as the "General Council."

2. Members of General Council to be eight in all—three nominated by the Royal Victorian Institute of Architects, one by the Architectural and Engineering Association of Victoria, one by the Melbourne University, one by the Governor-in-Council, and, after registration has been completed, two by the general body of registered practitioners. Persons nominated to serve on the first General Council to satisfy the Attorney-General that they are qualified to be registered under this Act. Each member of subsequent General Councils to be a registered practitioner. All members of first General Council to hold office for four years from appointment, and thereafter one member (not being one appointed by Governor-in-Council or by the Melbourne University) to retire in each year, but to be eligible for reappointment.

3. Duties of General Council.—To keep a register of qualified architects ; to remove names therefrom for misdemeanour or disgraceful professional conduct, &c. (N.B.—Draftsman of this Bill requested to consider this clause) ; to direct the holding of examinations in architecture ; to appoint examiners in architecture ; to make all necessary regulations for the proper carrying out of the purposes of the Act ; names and addresses of all newly-registered practitioners to be published within one month of registration in the *Government Gazette*, and in the month of September in each year a complete list to date to be therein published. (N.B.—Draftsman of this Bill requested to consider whether names struck off roll be published in *Gazette*.)

4. Persons qualified to be registered at the time of the passing of this Act.—(1) Those who at date of the passing of this Act are fellows or associates (other than honorary fellows or associates) of the Royal Institute of British Architects, or of the Royal Victorian Institute of Architects. (2) Any person of the age of twenty-five years who for the three (3) years immediately preceding the passing of this Act was *bonâ fide* engaged in practice as an architect in the colony of Victoria as a principal. (3) Any person of the age of twenty-five years who has served as pupil or assistant to an architect, or has been in practice as an architect, all or either, for seven (7) years in the aggregate prior to the passing of this Act. Classes 1, 2 and 3 to satisfy the General Council by such evidence as it may require of their right to registration under these provisions. (4) Application for registration under this section 4 must be made within six months after passing of this Act.

5. Persons entitled to be registered after passing of the Act must—(1) Be twenty-one years of age. (2) Have served apprenticeship (indentures) of four years with registered practitioner and passed qualifying examinations except as hereafter mentioned. (3) A person who before passing of this Act has entered upon or completed apprenticeship for a shorter term than four years with master qualified to be registered under this Act may serve the additional period to make up four years with a registered practitioner, and shall pass prescribed qualifying examination. (4) Any person of the age of twenty-five years who has been engaged in *bonâ fide* practice as an architect in the colony of Victoria as a principal for a period of less than three (3) years but not less than twelve (12) months prior to the passing of this Act shall, on passing the prescribed qualifying examination, be entitled to be registered. (5) Any person of the age of twenty-five years who has had not less than seven (7) years' experience in architectural office work to the satisfaction of the General Council and has passed qualifying examination shall be entitled to be registered. (6) Nothing herein contained shall prevent the General Council from reducing the term of architectural office experience required in clause 5 prior to examination to not less than two (2) years in the case of persons of the age of twenty-five years who can produce to the General Council such certificate or diploma of a university or technical school as may be recognised by them as of sufficient value to entitle such a person to this reduction of office service, provided that such university or technical school experience is of not less than three years' duration. (7) Provided that any person, whether a British subject or not, who either is or is not domiciled in Victoria, but who has practised as a principal architect elsewhere than in Victoria, showing to the General Council that he holds such a certificate, diploma, or other document as may be recognised by the Council as furnishing sufficient guarantee of the possession of the requisite knowledge and skill for efficient practice as an architect, and who can show that he is of good character, shall, on payment of registration fees, be entitled without examination to be registered under this Act.

6. Every person registered under this Act shall be entitled to practise as an architect in any part of the colony of Victoria, or, subject to local laws, any other part of Her Majesty's dominions, and to demand and recover in any court of law, with full costs of suit, reasonable charges for professional services, advice and visits, travelling and incidental expenses. (1) In the absence of any agreement as to charges, the schedule of charges published by the Royal Victorian Institute of Architects, as detailed in schedule hereto, to be adopted.

7. After the day of no person shall be entitled to recover any charge in a court of law for professional services as an architect rendered within the limits of the colony of Victoria unless upon the trial he shall prove that he is registered under this Act.

8. Nothing in this Act shall interfere with the right of a duly-qualified engineer to prepare plans for and superintend the erection of such buildings as are essential to any engineering work that may come within the scope of his practice. (1) A duly-qualified engineer for the purposes of this Act shall mean one holding diploma or certificate as a corporate member of the Institute of Civil Engineers (London), or as a water-supply engineer under the Irrigation Act of Victoria, or as a Master of Civil Engineering of the Melbourne University, or other diploma or certificate which in the opinion of the Council is of equal value to any of these.

9. Provided also, that on and after the passing of this Act it shall not be lawful for any public body to appoint any unregistered person as architect or as building surveyor to any such body or institution.

10. On and after the day of the words "legally qualified architect," "duly qualified," or any words purporting a person recognised by law as a practitioner in architecture, when used in any Act of Parliament, shall be construed to mean a person registered under this Act.

11. After the day of no certificate required by any Act now in force, or that may hereafter be passed or that is required by custom from an architect shall be valid unless the person signing the same be registered under this Act.

12. Provision to be made for penalties on unregistered persons practising for fee or reward or using title of architect.

The Act to apply to the whole of the colony of Victoria.

ROMAN REMAINS AT CHESTER.

THE excavations in the north city wall at Chester were temporarily suspended in June. At the beginning of September the work was recommenced at the point of wall where it had been stopped, and Mr. E. F. Benson, of King's College, Cambridge, with a grant from the Craven Fund of the University, came to lend valuable aid. On Monday last the archæologists of Chester met in the Grosvenor Museum to hear and see the results of the six weeks' work set forth by Mr. Benson. The chair was taken by the Duke of Westminster, and the large lecture-room was completely filled. Mr. Benson commenced by exhibiting on a screen magic-lantern slides of the more interesting inscriptions. The principal inscriptions

are six or seven belonging to the *Legio ii. adiutrix pia fidelis*, a legion which appears to have been in Britain under Agricola about the year 80 A.D. Previously only three stones of this legion had been found in our island—two at Lincoln, and one, no doubt of a man on sick leave, at Bath. The new finds suggest that the legion was at Chester, not, as Professor Hübner thought, at Lincoln, and Mr. Benson conjectured that possibly it may have supplied the garrison of Deva while Agricola took the Twentieth Legion northwards, as Tacitus tells us, on his campaign against Calgacus. In any case the Second Legion—not to be confused with the "Legio ii Augusta" of Caerleon—must have been wholly or partly present in Deva about the year A.D. 80, and its memorials are interesting if for no other reason than that we can fix their date. Next in interest were inscriptions of the well-known Twentieth Legion, many of them epigraphically valuable and extremely well preserved, far better on the whole than the stones of the Second Legion. There followed the sculptures and carved stones. Of these the most interesting was one bearing an inscription in memory of a deceased lady, Curatia Di(o)nysia, who died at the age of forty. The tombstone, which is extremely well preserved, represents a lady reclining on a couch at a "funeral banquet," and is a capital instance of this common type of tombstone, derived originally from the worship paid to the deified ancestor, but in Roman hands become a conventional scene. The inscription itself presents some points of interest. The "y" of Di(o)nysia is the Greek upsilon, not a Latin "y," and the omission of the "o" of the second syllable is strange. After this came bits of some frieze. Mr. Benson had, he said, found triglyphs, metopes and a bit of architrave, all in white sandstone, and presumably belonging to one building. Finally, he showed a circular doorhead, which appeared to have belonged to a private house. After exhibiting these slides, the lecturer turned to the opening made near Mr. Dixon's yard in the east wall. Here was found the same Roman masonry, but, so far as examination had been made, no inscriptions, so that the cemetery must have lain, as at Lincoln, on the north side. The date of the wall formed the subject of the rest of the lecture. Competent judges (said Mr. Benson) have put it down to Severus (say 200 A.D.), but a combination of various facts suggested to him something earlier. The Twentieth Legion certainly sent troops to aid in building the Walls of Hadrian and Antoninus. The freshness of some of the stones required but a short period of exposure to the air, and he thought that when the troops sent to assist in the Wall of Antoninus came back they would naturally like an enlargement of the city. This of course was only a hypothesis; it was liable to correction from future discoveries or from better interpretation of known facts, and he only stated it as a view which seemed to him very probable. The cornice on the wall, he added, was Roman, but (as had been suggested in Chester) was perhaps put up when the breaches were repaired in the seventeenth century. Finally, he enlarged on the great aid given to the work by the city surveyor (Mr. I. M. Jones, F.S.I.), who had indicated suitable places to work at, and had been devoted to the operation. The lecture ended with a warm acknowledgment of the kindness of the Duke of Westminster to the excavations.

The Duke of Westminster then briefly proposed a vote of thanks for the excellent lecture, and called on Mr. F. Haverfield. Mr. Haverfield, in seconding the vote of thanks, expressed himself strongly in favour of going on. They were in the midst, probably, of Second Legion stones; they could not leave the riddle half unread. The discoveries were of the greatest importance to scholarship. He had lately visited a Roman fortress on the Danube below Vienna. There he asked who paid for the extensive excavations. He was told that the Emperor of Austria and the rich men and the archæologists of Vienna contributed some 2,000*l.* yearly. Englishmen might be ashamed that they could not do that in England, the home of voluntary work as opposed to State aid.

Mr. Benson, in a letter on the excavations, says:—"I have been in charge of the excavations at Chester for the last five weeks, and during that time we turned up a quantity of tombstones that give rise to a perfectly new factor in the history of the Roman occupation of Chester, and, indeed, of England generally. These tombstones belonged, as the inscriptions showed, to the supplementary 2nd Legion, or, as it appears on the monuments, "Leg. II. ADPF," or "Legio secunda Adjutrix Pia Fidelis." Up to the time that I made this discovery of them at Chester only three had been found in Britain, two at Lincoln and one at Bath. Bath of course was a health resort, and we cannot argue anything from the tombstone found there, except that a soldier of the 2nd Legion went there, but did not apparently get any better under the treatment, so that on the whole the balance of evidence lay in favour of its having been quartered in Lincoln. But during September I found six tombstones at Chester, built up into the north wall, belonging to soldiers of this legion. The legion came to Britain under Vespasian probably about the year A.D. 75, and left Britain for good under Domitian—that is to say, before the end of the first century. It seems, then, beyond a doubt that it was quartered at Chester, as we have already discovered there twice as many records of its presence as are to be found in the rest of Britain put together. Now we know that Agricola took the 20th Legion, whose home was at Chester, into Scotland, where it took part in the wars against Calgacus and other remote monarchs, and it would seem very probable that he left the 2nd to garrison Chester in the absence of the 20th. It would clearly be most ungeneral-like to leave so important a place undefended. He had just concluded a war against the tribes of North Wales. He had attacked British independence in its stronghold at Anglesey, while to the north the Brigantes were ever a turbulent folk, and for commercial reasons it would be highly undesirable to leave Chester without a garrison, for it commanded the valuable lead trade from Flintshire. For these reasons I venture to suggest that the above is the explanation of the presence of this legion where it was so little looked for. These tombstones had in all cases a rounded top, which seems at Chester at least to be peculiar to them; it is certainly not found on monuments of the 20th. This I take to be not so much a specialty of the legion as a mark of date, and I should be glad to know if other evidence confirms this. In other respects also the excavations have been highly successful, among which I may mention the discovery of a piece of distinctly Roman wall on the east side of the town, similar in all points of style to that on the north, and thus tending to show that the two were built at the same time."

TESSERÆ.

A. W. Pugin.

WHETHER as an artist, author, architect or practical assistant in collateral departments, Pugin was alike distinguished. He stood confessedly among the first, if not the very first, of able draughtsmen, scarcely less dexterous in the use of his pen and fertile in imagination and taste, whether designing a complete structure or its minutest accessory. It is not necessary to trace how much of the best detail in the new Houses of Parliament is due to this master-hand, nor the extent of his influence upon those who had the good fortune to work under his directions, many of whom are now evidencing the sagacity which, in the first instance, selected them for the purpose, and the aptitude which trained them for their respective pursuits. Was stained-glass, metal-work, furniture or embroidery required, Pugin could design it, and correctly too. The same with decoration generally; it was a branch of art in which he took delight to revel, and his published "Glossary of Ecclesiastical Ornament" is a mine of wealth. Who has not seen or heard of his churches in London, Birmingham, Nottingham, Cheadle and elsewhere, or the proofs of his versatile genius at Alton Towers, or in his own residences at Salisbury and Ramsgate? Again, many still remember "Pugin's Mediæval Court" in the Exhibition of 1851, though comparatively few persons witnessed his self-denying exertions in collecting and perfecting his materials, ever and anon bustling about with indefatigable enthusiasm to have the right thing in the right place. Pugin was, it is needless to say, a man of ready and quick observation. Quick, too, in committing to the pages of his ever-ready sketch-book such things as met his eye, and which he would treasure in his memory for future use. It mattered little to him whether in mass or detail, colour or form, his pencil or crow-quill could hit off, in perhaps a few strokes, a thoroughly characteristic sketch, embodying all that he desired specially to note. And it is worthy of remark how eminently tutored was his eye and how unerring was his hand in all that relates to perspective drawing. The examination of his original drawings of the more finished kind shows that after the preliminaries of a very few faint pencil lines by way of guidance, and which he often did not care to rub out, he would fill in the most careful and accurate picture with a due regard to the proportion of its parts and an expressive indication of its details truly remarkable. At the same time he could, if so disposed, treat only with the masses of a composition, which he handled with equal artistic power.

Mezzotint Engraving.

The invention of mezzotint is ascribed by Lord Orford and Vertue to Prince Rupert; but Baron Heineken considers that the first idea of it was conceived by Ludwig von Siegen, a lieutenant-colonel in the service of the Landgrave of Hesse. He executed a portrait of the Princess of Hesse, which is dated 1643, seventeen years before the discovery is said to have been made by Prince Rupert. It is further said that Prince Rupert learnt the secret from Von Siegen, and brought it with him into this country as his own, when he came over with Charles II. at the Restoration. Some, again, contend that Rembrandt was the author of it, but Bartsch shows very clearly that he had no claim to it. The tools which are used in this process are, first, an instrument called a *berceau*, or cradle. It consists of a

series of points, like the extreme ends of a small-tooth comb, to which a handle is attached at the top. These are not in a line, but form a portion of a circle, of which the radius is 6 inches; this therefore will be similar to the support of a child's cradle, and when used in an upright position is rocked backwards and forwards on the plate, having the effect of ploughing up the surface; hence its name of cradle. The other tools are scrapers, shading-tools and roulettes. The last-named instruments are similar to the rowel of a spur, and are used to work off any additional part of the surface of the copper. The plate, after being polished in the usual manner, is divided equally by lines of soft chalk parallel to each other, the distance between each line being equal to one-third of the length of the face of the cradle. This instrument is then placed between the two first lines at the top of the plate, and worked backwards and forwards in the same direction. This must be done very steadily, until the operator has completely ploughed up the surface of the plate. He thus goes on from line to line until the whole of the plate has been operated upon. Other lines are then chalked down at right angles to the former ones, and the same treatment of the plate is pursued in the new direction. A third order of lines is then drawn diagonally, and the same process with the cradle is observed. When this operation is completed, the plate is said to have undergone one turn. In order to produce a very dark and uniform ground, the plate must undergo a repetition of this tedious process at least twenty times. Bartsch says that a plate 2 feet long and 8 inches broad requires three weeks to produce a jet-black impression, and a larger plate sometimes more than a month. In other kinds of engraving the artist has a clear burnished surface to work on, and his business is to work up his intended effect by a series of lines arranged according to what he wishes to represent; but in mezzotint engraving the process of producing the picture is perfectly the reverse. Here the operator has a perfectly black surface to work upon, and his object is to arrive at the middle tints and extreme lights by removing more or less of the grained surface of the plate. This is effected with scrapers of different sizes. The strongest lights are taken out first, and many parts, where great clearness is required, are burnished. The different degrees of shading are then introduced, and afterwards the reflected lights. We have few instances now of pure mezzotint being executed. The outline of the subject is almost always laid in with a strong bold etching, which gives greater effect, and relieves that extreme softness which has been complained of in this branch of engraving. Its peculiar advantages, however, consist in the soft gradations of light, so that a good mezzotint print appears as if it were executed with the brush.

Inigo Jones's Sketch-Book.

The sketch-book is a relic of extraordinary value and curiosity, consisting of drawings in pen and ink, with accompanying illustrative remarks and general observations, entirely by the hand of the architect of the Banqueting House at Whitehall; and it affords evidence of the great diligence as well as of the skill and taste of the author. It was made while he was in Italy in the year 1614. The sketches are not only from statues and reliefs, but from pictures by the most celebrated masters of the Italian schools, and the motto chosen by this distinguished man, and prefixed to his sketch-book, supplies an interesting characteristic, showing that at the age of forty-two Inigo Jones thought himself happy only while he was improving his taste, enlarging his mind and laying in fresh stores of science—"Altro diletto che imparar non trovo." Another circumstance connected with this production deserves notice. It is known that Inigo Jones evinced his earliest fondness for the arts in landscape painting, and in the Duke of Devonshire's collection is a rare specimen of his skill in this department. Although Inigo Jones had been appointed architect to the King of Denmark before the year 1606 the sketch-book does not contain a single design, hint or note, of or for any building, public or private; while it is obvious from every page that the author was studying the human figure with great care and delineating the features of the human face in minute detail. Hence it would seem that in 1614 he was devoting his attention very much to painting and sculpture, as if anxious to supply deficiencies of which he was aware, and as if this, his second visit to the Continent, had been undertaken chiefly with that purpose. It will be seen that nothing was too great for his ambition, nothing too insignificant for his observation, from the *Last Judgment* of Michel Angelo to the simplest folds of drapery. The sketch-book of Inigo Jones also serves to clear up a point in his biography, of the more importance because it has relation to his quarrel with Ben Jonson. On the first page it bears the date of "Rome, 1614," which at once settles the question disputed by Mr. Gifford and Mr. A. Chalmers, whether the disagreement between Inigo Jones and Ben Jonson "commenced in 1614." Of course it could not "commence" while Inigo Jones was in Italy, and the hostility certainly did not break out until a much later period, viz. Christmas 1631–32. Inigo Jones at that date took offence that Ben Jonson had omitted his name on the title-page of the masque of "Chloridia," on the preparations and scenery for which Inigo Jones had been engaged. This circumstance establishes that Ben Jonson had no reference to Inigo Jones in his "Bartholomew Fair," acted in 1614, the very year when Inigo Jones was in Italy, while it tends to fix upon him the ridicule contained in "The Tale of a Tub," which was performed in 1633. The precise date when Inigo Jones returned to England has not been ascertained, but his departure has been erroneously stated to have taken place in 1612. It appears by a Privy Seal that Inigo Jones was engaged in January 1612–13 in making arrangements for a masque at Court. He probably left this country soon afterwards. The sketch-book is only a very small part of the valuable remains connected with the life and reputation of Inigo Jones transmitted to the Duke of Devonshire by the celebrated Earl of Burlington. Inigo Jones, with some interruptions in consequence of absence from England, superintended most of the Court entertainments from the accession of James I. to the commencement of the Civil Wars, and at Devonshire House are preserved the original designs, not only of the scenes but of the characters, for the masques at the different royal residences. The details of all the fantastic habiliments are given with the utmost minuteness, both as to form and colour, and the sketches for large views of rocks, waterfalls, woods, palaces or temples illustrate most remarkably the contrivances for the representation of those splendid shows which were the peculiar delight of our first Stuart and of his unfortunate successor.

Decadence of Ancient Art.

The state of artistic design was undoubtedly at its lowest when basilicas began to be erected as churches. The old Greek sense of beauty had died out in Rome. Luxury and vulgarity had gradually destroyed the manliness of the race, and such sense and love of beauty as it had possessed in days of vigour and prosperity. Constantine could find few competent artists either to sculpture his triumphal arch or to decorate his new capital. Still the Christian community had carried down with it into its subterranean oratories and chapels certain traditions of former times. Historical representations, even sometimes under mythological types, as that of Orpheus, are habitual to those interesting monuments. The classic, and occasionally the nude figure, continued to be represented in their paintings. As basilica building and decoration progressed, a marked difference is to be found between the simplicity of accessories of dress and ornament in the west, in contrast with the elaboration of colour and detail in the east. The basilicas of Justinian at Ravenna are interesting examples of this Byzantine spirit. They represent in more than one instance the emperor and his court, or his empress and her court, with details of costume carefully followed. But though these designs were rude, and showed ignorance of form, they were by no means wanting in grandeur. Quite the contrary. That nerve and vigour of character which luxury had eaten out of the Italian character was beginning to grow anew from fresh sources, and Christianity really inaugurated the revival of the arts. That revival was slow, and conducted through most stormy ages of calamity, but a genuine revival it was.

Romanesque Windows.

In all periods of Romanesque we find occasionally two or more arched openings comprised under one enclosing arch. This arrangement is more frequent in belfry windows and triforium openings than elsewhere, but occurs in ordinary windows, especially in secular buildings. The space intervening between the large arch and the two or more placed below it was, even as early as this, occasionally pierced with circles or other forms of opening. Here, then, we have the elements of the mullioned window before even the introduction of the pointed arch. In the same situations it gradually developed itself, step by step, during the Early Pointed period, so that we have in triforium arcades and in other positions a pretty full development of what is called plate tracery, before its use became frequent for ordinary windows. The case was pretty much the same both in France and England, though, on the whole, the love of placing two openings under one arch was greater in France; thus we see in the aisles at Chartres two plain lights under one arch, with a circular opening, and above, in the clerestory, a very large circle with somewhat complex subordinate piercings. The same is the case at Bourges, where three lights are often comprised under one arch, with a single circle in the head. The next great element which aided in producing tracery windows was the wheel, or other richly-pierced circular window. This, again, originated under the Romanesque style, as we may see at Barfreston and elsewhere. It is, in fact, a very close approach to tracery, and when placed in the space between comprising and comprised arches, it almost completes the change. All that is wanted is the piercing of the intervening spaces in forms whose outlines are parallel to the main piercings, so as to form what Professor Willis calls bar tracery.

NOTES AND COMMENTS.

The first meeting of the session of the Birmingham Architectural Association was held on Tuesday last, when Mr. W. Hale delivered his presidential address. He asked the members to consider that there was but one true meaning of the term architecture, and that the practice of architecture was an art resting on a scientific basis, and not a mere business. He pointed out that a building might be well or ill planned, and soundly constructed, and yet be devoid of architecture; but that it was essentially a part of good architecture that the building should be well planned and built. Mr. Hale then urged that good architecture could not be obtained by mere antiquarianism, and that the study of old work should be made with the view of adapting the principles which produced good results to the needs of modern times. This could not be done by mere following of precedent, but good results could only be obtained by basing the artistic elements of architecture on the scientific laws which should govern the planning and construction of modern buildings. In looking to the future, Mr. Hale thought that there was much reason to hope for better things, for though architecture could not be considered level with the times, the work of to-day was greatly better than that of thirty years ago, and the junior members of the profession were enthusiastic, and had greater opportunities than their predecessors; though, on the other hand, he felt that the general public understood nothing of architecture, and he would like to see some education in the elements of it given in schools. Mr. Hale also spoke in favour of a suggestion which had been made that an artist architect should be appointed by city authorities to approve the designs of new buildings.

The people of Exeter are not remarkable for intelligence, but a jury of the citizens has been competent to deal with a claim for 60*l.* 16*s.* by an architect which was sued for at the City Quarter Sessions on Monday. The circumstances were characteristic of the odd way of doing business which prevails in Exeter. A firm of stationers and printers in May 1890 instructed Mr. A. H. Wills, an architect, to prepare plans for an extension of their premises. The commission was executed, and, in addition, a picture of the shop in its future state was drawn. Subsequently a specification was prepared, quantities were taken out, but tenders could not be obtained as there was a strike in the building trade. After a time, however, tenders were sent in. The lowest was 748*l.* The sum was considered too high, and the work was reduced until it could be done for 595*l.* In Exeter there is parsimony, and, in the hope of effecting a further reduction, the plans were again altered. Work to the value of 60*l.* was set aside, and the architect was compelled to decline the responsibility for the consequences, as the building would not be able to stand the strain of the printing machines. As further cutting-down was impossible, the head of the firm proposed to wait until a nephew reached manhood! The architect sent in his account, and, as it was not paid, he was compelled to take an action. Of course there could be no valid defence, and the defendant shuffled in his evidence in a way that was remarkable even for Exeter. The large sum of 1*l.* 5*s.* had been paid into court, and the jury brought in a verdict for an additional sum of 43*l.* 15*s.* Why the whole sum claimed was not awarded is not plain.

The Parthenon was not the first temple dedicated to Athené that stood on the Acropolis. Previously there were two temples under the protection of the goddess, the larger being known as the Hecatompedon. It was generally assumed that the Parthenon was built on the site of the larger building. This belief was expressed in the quotation from Landor that was printed lately, in which Aspasia is made to say, "The Hecatompedon, which many of the citizens begin to call the Parthenon, is now completed, and waits but for the goddess." The Germans, on the other hand, contend that the smaller and older of the two temples was the Hecatompedon. A paper on the subject was read by Mr. F. C. Penrose at the meeting of the Hellenic Society on Tuesday. On the strength of carefully-worked-out architectural evidence Mr. Penrose explained that the earlier temple occupied the same site as the later Parthenon, and that to it, and not, as Dr. Dörpfeld maintains, to the archaic temple which stood between the Parthenon and the Erechtheum, belonged the drums and other architectural fragments which have been built into the north wall of the Acropolis. Mr. Penrose further thought it probable that the very remarkable groups of archaic sculpture which were found on the Acropolis a few years ago had occupied the pediments of the Hecatompedon. Judging by the practice among Christians during many centuries, which seems to be in accordance with common feelings, the site of the Hecatompedon would be considered as sacred and the most suitable for the new temple. But there is no doubt Dr. Dörpfeld's theory has found much favour with archæologists. It has been adopted by Professor Maxime Collignon, of Paris, who was not likely to be biassed by anything coming from a German source. He says:—"It is generally supposed that the present Parthenon was built upon the site of the ancient Parthenon that was burnt by the Persians; but if so we must believe that the Athenians allowed the ruins to remain for the period between the Persian war and the reconstruction. The results of the recent explorations have furnished the solution of the problem. We must recognise the ancient Temple of Athené in an edifice of which a part is mixed with the substructure of the Erechtheum. That was the temple constructed of stones from the Piræus, and which was destroyed by the Persians. When Cimon constructed the south wall of the Acropolis, he began the construction of a new Parthenon on the site of the actual building, but the works were interrupted through his exile, and there seems to be no doubt that the drums of Pentelic marble that were found built in the north wall of the Acropolis formed part of his building. Pericles, in his turn, commenced and completed the building that still exists." The subject is one that is well adapted for controversy. Mr. Penrose is not the originator of the theory that the Hecatompedon and Parthenon are on the same site. It is an old one in English classical schools. But he has set up evidence in its support of a kind that was not attainable by scholars.

The parish church of Stratford-on-Avon has been made so familiar to American eyes by means of engravings and photographs, it is no wonder some visitors are dissatisfied when they behold the building in its transformed state. A Mr. Winter supplies the *New York Tribune* with the following account of his emotions on a visit to the church:—"I went into the chancel a few evenings since, and stood there alone in front of the altar and looked around, and I was amazed and grieved by what I saw. The aspect of that chancel is no longer ancient, but quite new. The altar has been moved from its place against the eastern wall, beneath the great window, and has been elevated upon a double pedestal. The floor of the chancel round about it has been paved with encaustic tiles of hideous brown and yellow. Almost all the mural tablets upon the north and south walls have been taken down and carried away, and they may now be found dispersed in the transepts; while their place is to be filled with a broad expanse of new wooden panels, extending from the back of the *miserere* stalls upward to the sills of the windows. The stalls themselves have been repaired, but this was necessary, because the wooden foundations of them had become much decayed. And, finally, the stone screens that filled up the window back of Shakespeare's monument and the window back of the monument of Judith Combe and her lover have been removed. The resultant effect—which would be excellent in a modern hotel, but which is detestable here—is the effect of enterprise, action and novelty. The pervading air now is that of the new broom and 'all the modern improvements.' Those improvements, no doubt, are very fine; but if ever there was a place on earth where they are inappropriate and offensive, that place is the Shakespeare Church." The clergy and the good people who paid for the renovation have reason to be dissatisfied with Mr. Winter, for it was no doubt with the intention of gratifying Americans that such sweeping alterations were undertaken. For who else was the church made spick and span as a modern hotel? Yet Mr. Winter says that "all that was asked was that it should be left alone." Such is Western gratitude for making the building worthy of the youngest city.



ALLIANCE ASSURANCE COMPA

Messrs. GODDARD, PA

23rd 1891.



BRANCH OFFICES, LEICESTER.

GODDARD, Architects.



PLAN.

COTTAGES AT MORTLAKE FOR D. DE CASTRO ESQRE

£200 EACH

JAMES RANSOME, ARCHTECT.



HOUSE AT WIMBLEDON, FOR PERCY A. BULL ESQRE.

JAMES RANSOME, ARCHITECT.



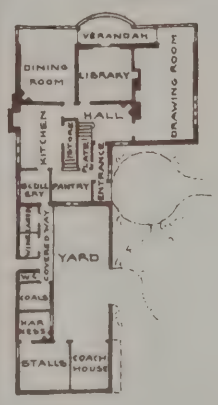
THE DRAWING ROOM, LOOKING FROM VERANDAH.

The Architect, Oct. 23rd 1891.

Printed by Sprague & Co. 4 & 5 East Harding Street, Fetter Lane E.C.

HOUSE AT USK, FOR MAITLAND WATKINS ESQRE.

JAMES RANSOME, ARCHITECT.



PLAN.



SOUTH FRONT.

HOUSE AT USK, FOR MAITLAND WATKINS ESQRE.

JAMES RANSOME, ARCHITECT.

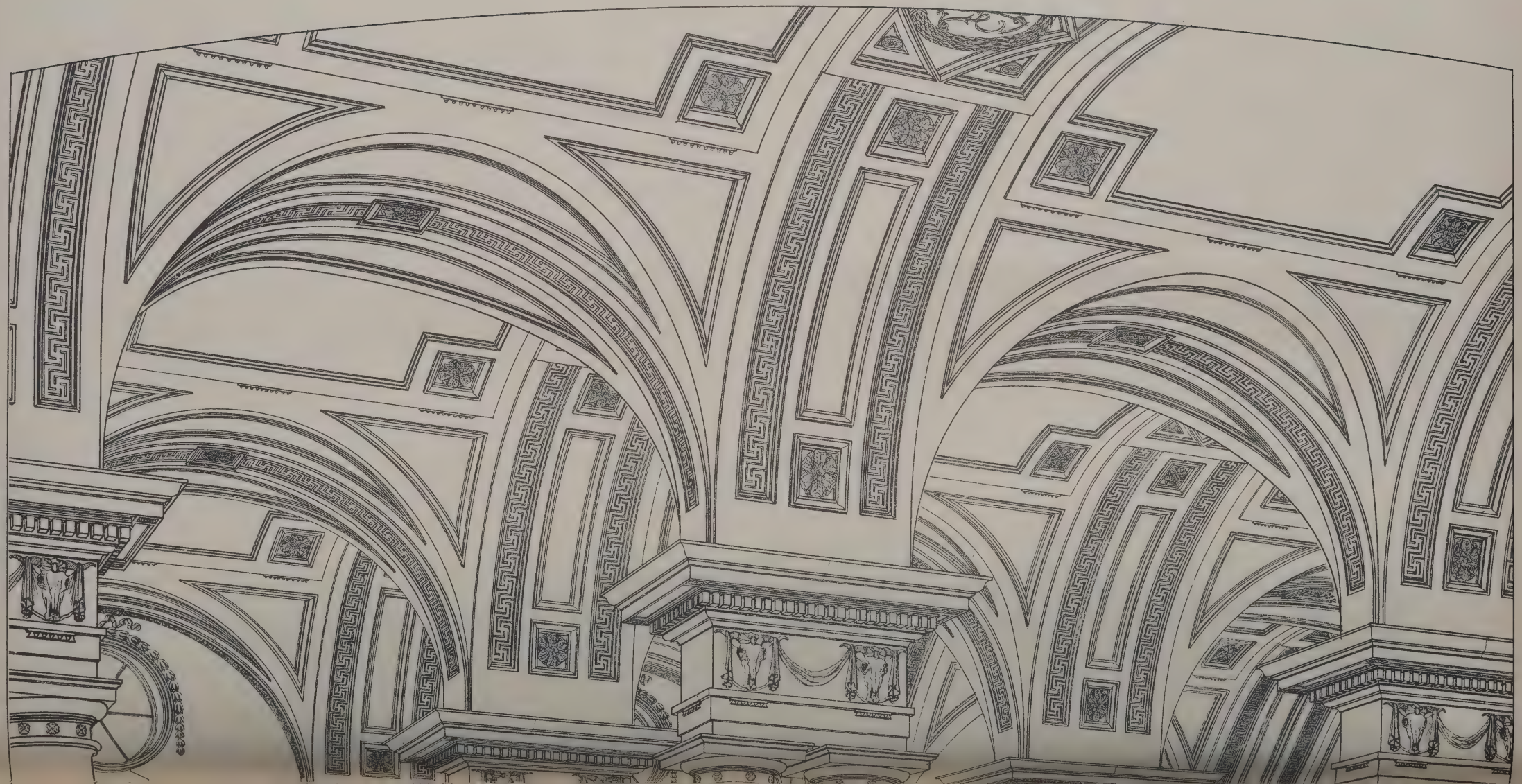


STABLES.



ENTRANCE FRONT.

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THE ENTRANCE: SOMERSET HOUSE.

From a Drawing by FREDERICK MILLER.

The Architectural Illustration Society. Second Series. Plate No. 426.

ILLUSTRATIONS.

ALLIANCE ASSURANCE COMPANY'S BRANCH OFFICES, LEICESTER.

THIS building is now in course of erection, and stands in one of the best positions in the town, opposite the Municipal Offices. The ground floor is faced with Portland stone, and the upper storeys with Bracknell sand-brick rubbers. The large office of the company, with the board, secretary's, waiting and strong rooms, occupy the ground floor, and the upper floors are arranged in suites of offices. The architects are Messrs. GODDARD, PAGET & GODDARD, M.R.I.B.A., of Leicester, and Mr. J. O. JEWSBURY, of the same town, is the contractor. The drawing that has been reproduced was exhibited this year in the Royal Academy.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 426.—THE ENTRANCE, SOMERSET HOUSE. [DRAWN BY F. MILLER.]

HOUSE AT WIMBLEDON. COTTAGES AT MORTLAKE. HOUSE AT USK.

THE ARCHITECTURAL ASSOCIATION.

THE first ordinary meeting of the session was held on Friday evening, Mr. F. T. Baggallay, president, in the chair.

Messrs. R. A. Jack, W. G. Watkins and P. J. Hanson were elected members. The list of names nominated for election as members amounted to fifty-three. Various donations in aid of the new scheme of education and donations to the library were announced, a special vote of thanks being awarded to the donors.

The PRESIDENT stated that Mr. F. R. Farrow had been appointed lecturer in connection with the new curriculum, and consequently, in accordance with their rules, had sent in his resignation as Vice-President.

The PRESIDENT then distributed the prizes, after which he delivered the annual address as follows :—

The President's Address.

It is probable that never since the constitution of this society, forty-four years ago, has the president for the time being risen to deliver his address at the opening meeting under a heavier sense of responsibility than that which I feel at this time. We stand together as an Association at the threshold of a new life; we have taken upon ourselves, as a body, grave responsibilities, fraught, in all probability, with good or ill consequences of the most serious kind, not to ourselves alone, but to the profession and ancient art of architecture. At such a time you have a right to expect from him upon whom you have conferred the highest honour at your disposal, by placing him for a time at your head, that he shall well weigh the words which it is one of his duties to utter. At first sight, the most obvious course to take at a fresh point of departure, such as the present certainly is, would be to recite the main facts of the history of the Architectural Association, and especially of the history of the past two years, during which the changes now brought about have been discussed and decided on. I am, however, afraid of wearying you by any such recital, and, moreover, it might be difficult to avoid all controversial matter such as you are probably as desirous as I am should be left alone. The main facts and considerations which, in my opinion, have been accumulating for many years, and have gradually impressed upon most of us the great necessity for a radical reform in the method of conducting our classes, were fully stated and commented on in a paper read before the Royal Institute of British Architects last July. This paper was issued to all of you as a supplement to the August number of "A.A. Notes," and I do not, therefore, think those facts and considerations need be again referred to here.

It is, however, necessary to state what changes have been made, and some of the main objects aimed at in them. This I will do as shortly and concisely as possible, premising that all that has been done is based upon the resolutions relating to the matter which were passed by the Association in June 1890. The four principal objects or central ideas have been—first, to substitute a series of classes arranged on a comprehensive system, for the old classes all independent of one another, with a view to conducting students through a regular course; secondly, to substitute a single responsible teacher or lecturer in most cases for a group of voluntary instructors, with a view to making the instruction more consistent, consecutive and effective; thirdly, to fill up gaps and make the course complete; and fourthly, to provide a place in which students could make their drawings and designs under the superintendence of competent instructors, with the advantage of their advice while at work, instead of only hearing their criticisms when it was completed. With these objects in view, a regular curriculum of study has been drawn up, the details of which are all fully set out in our Brown Books, and in the pamphlet which has been sent to you all, and for the editing and circulating of which we are indebted to our enthusiastic honorary secretary, Mr. E. S. Gale. To conduct the work of the various classes, lecturers and instructors have been appointed, whose names will be found in the Brown Book, and are a guarantee that their work will be well done. It is almost unnecessary to add that in many cases the task has been undertaken out of pure goodwill to the Association, or to the cause of architectural education. To provide the accommodation for drawing and designing, and also to provide proper classrooms, new premises at No. 56 Great Marlborough Street have been rented, where a library and reading-room and office, two classrooms and two studios have been fitted up. You are already aware that the increase in the secretarial work of the Association involved by these fresh arrangements, added to the already heavy burdens laid upon our honorary secretaries, has necessitated the appointment of an assistant secretary at a salary.

The fees to be paid by students have been fixed in accordance with the resolution dealing with that matter. They are, of course, large as compared with the old nominal class fees; but from all other points of view I think they must be acknowledged to be exceedingly moderate. At the same time it is calculated that, under the arrangements made, all expenses for instruction and the increase in rent and other expenses involved by the change, will be paid by these fees if twenty-five fresh members take up the course each year and pass steadily through the four years, or if there is an equivalent attendance in other ways. These arrangements, although they leave many important branches of our work untouched, a circumstance which has, I fancy, sometimes been overlooked, certainly represent something like a revolution in our system of education, which has always been and must, I think, always remain our chief object. The change may seem to many to have come somewhat suddenly; but those who have watched closely the position and work of the Association and the advance of architectural education in recent years, cannot but have observed the gradual approach of the time when some such change would be absolutely necessary, unless, indeed, we should be satisfied to sink into insignificance or become a mere social body. Not only had our classes become too numerous and some of them too unwieldy to be managed in the old way, but the technical training of architects had become too serious a matter to be undertaken in other than a serious spirit and systematic manner. A change of some sort has been foreshadowed, more or less, by almost every succeeding President, in the annual addresses of the last seven years, and the nature of the change has, as you know, cost us during more than two years much discussion and much thought and labour. It has now been effected with the sanction of the general body of members, and, whether for good or ill, we are launched upon a course which most of us believe is destined to lead the Association into a position of influence and usefulness very far in advance of even that that it has hitherto occupied, but which, it cannot be denied, may prove at the outset one of some danger and difficulty.

It is not easy for me to indicate precisely where the danger or difficulty may appear, nor do I wish to anticipate anything of the sort; but when we think of how small a reserve of funds —notwithstanding the generosity of our friends—the Association has to fall back upon, it is impossible to feel that we are safe in that direction. Then, again, it would be strange if all the arrangements for the future, made, it is true, with an immense amount of labour and anxious care, but still under some pressure of time and necessity, and without the data which experience alone will provide, were found to be faultless, or to work in every respect perfectly satisfactorily. We must, I think, expect as time passes to find that many improvements are possible, and will have to be introduced. Again, it would be almost as strange if such changes as have been effected had been brought about entirely without injury to some individual interests. Any considerable change or reform in such an old-established society as ours must, I imagine, almost inevitably at the moment produce a small crop of grievances. I hope it may not prove to be the case in the present instance—and at least we may be sure that *esprit de corps* will prevent anyone making more of his grievances than he can help; but that makes it all the more incumbent on us not to shirk the difficulty, but to be prepared earnestly to endeavour to mitigate any hardship inflicted upon individuals, if we can do so without injury to the interests of the Association as a body. It will usually fall to the lot of the committee that you elected last May to deal in the first instance with any difficulties which may arise. That committee has laboured almost incessantly for the last

four months, and will so continue to labour, in the interests of the Association, and for the promotion of its objects. It is unusually representative of a large number of interests and shades of opinion in the Society, and I am sure that it has the confidence of the general body of members, and will receive their support in the future as in the past.

To return to our new curriculum. The fact that the course extends over four years has been much criticised, some being of opinion that it is too long a period, and some that it is too short; but I think if you consider that among those who use our classes are not only pupils in all stages of their articles, but also assistants and others of some years' experience in the profession, and that it would be neither just nor expedient if we omitted to provide, as far as possible, for the wants of all of these; when, too, you remember that those who intend to become members of the Institute must in future, according to the regulations, allow four years to elapse between their preliminary and final examinations, then I think you will come to the conclusion that there are sufficient grounds for the arrangement that has been made. We cannot, of course, expect that all who take up the course in the first or any year will go through all the subsequent years—loss of enthusiasm, pure idleness and circumstances of various kinds will cause many to fall out, and the gaps cannot all be filled by those who come up from the country or from abroad to finish their professional education or by the occasional students who prefer to pick out only certain classes. We must, therefore, be prepared always to find a rather larger number of students working in the earlier years than in the later ones, just as hitherto our elementary classes have always been the better attended. If, however, the classes are properly and efficiently conducted, as it must be our business to see that they are, we may fairly expect that a considerable number, probably a large majority, of future members will see the advantage of working steadily through the four years' course, for, even if the opportunity of gaining an insight into all the subjects taken up were not sufficient inducement, the spur of the Institute examinations might be trusted to keep many at work.

It is still impossible to judge of the extent to which the new classes will be popular, but the number of students who have taken up the course, or parts of it, already is quite as large as, if not larger than, one could reasonably have expected to begin with, and the number increases every day. One very promising circumstance is that by far the largest number have entered as "first-year" students. If most of these gentlemen work steadily through the four years' course, and if about the same number enter each October, there can be no doubt whatever that in the estimated three years' time, or even sooner, the full number expected will be reached. Judging by the attendances up to the present time, the studio, contrary to the expectation of many, appears to be a very popular part of the new arrangements. Another most encouraging circumstance, and one deserving to be especially mentioned, is that, in a considerable number of cases, the fees appear to be paid by the principals for their pupils. In this connection it is worth while to mention that a fuller comprehension of our intentions and arrangements seems to have led to an approval of them which is not only much more general among architects than at one time seemed likely, but which appears to be now very nearly universal. Several of those who at first certainly viewed the proposed changes with suspicion, if not with dislike, have now expressed an approval more or less cordial, and one or two have subscribed to our funds or promised help in other ways. Perhaps the greatest encouragement we have received is from the fact that the Royal Institute of British Architects so far thinks well of what we are doing, that it has in the most friendly spirit passed a resolution pledging itself to afford us pecuniary assistance, and instructing its Council to consider and decide as speedily as possible in what manner and to what extent such assistance shall be given. I do not know at present what decision will be arrived at, but we have every reason to believe that the donation or subscription will be a generous one.

The premises, which after much trouble and delay we have been so fortunate as to secure, though a little small, are in all other respects admirably suited to our purposes. We only obtained possession about a fortnight before the opening of the session, and, notwithstanding every effort on our part, they were still far from ready when first used; they are now, however, in fairly good order. It will still, naturally, take a little time before we completely settle down into them: but when we have done so, I believe they will prove to be very convenient and well adapted to the uses to which we are putting them.

Funds are still much needed to meet the heavy initial expenses and the deficit on account of the classes which there must be this year, and which there will probably be for one or two years to come. Notwithstanding the generous donations we have received, the 2,000*l.* we asked for has not yet been half subscribed, and I do not think we can rest content without the full amount. A much larger sum which could be treated as capital or as reserve is, indeed, needed before the Association can consider itself in a perfectly secure and satisfactory financial position. But pressing as the financial question is, it is not so pressing that it should exclude from our minds the grave responsibility we have assumed towards those who will entrust their technical training to us, and, indeed, towards the whole of the architectural profession. I put the matter thus, because, although we have from the first held classes, and have for some years given lectures, and done a good deal of serious teaching, we have never before professed to do the greater part of it in other than a semi-amateur way, and have never pretended that the Association course was anything like a full or sufficient complement to the practical training of office work. We may say that we make no such pretension now, and shall be right in so far that private study, especially in certain directions which I propose presently to indicate, will be as necessary as ever; but as regards such technical training as lectures and classes can give, I am afraid students and the profession will now have a right to expect our course to be complete and efficient.

I think we cannot justly refuse to accept this responsibility, or to strive earnestly to fulfil the duties of the position we have assumed, by making our teaching as complete and as efficient as the most strenuous efforts and most watchful care on our part can make it. Among the duties which it is possible for a professional society to charge itself with, I can imagine none more useful or more honourable than this training of its younger members for the practice of their art, and if we are true and faithful in discharging this duty, we shall deserve the gratitude and should have the support of the whole of the architectural profession in this country. Architectural education has been the subject of much that has been said and written in recent years, and considering the many-sided character of an architect's work, and that it is quite impossible for any mere man to have all the skill and knowledge which a theoretically perfect architect would have, it is not very surprising that there are almost as many opinions as there are writers and speakers. Some hold that pupilage is all-sufficient; some that it ought to be done away with; some put their faith in sketching and measuring up what our forefathers built; others say that a modern workshop is the proper school for us; some would have the German school system, others the French atelier system; and there are plausible, indeed very good and sound arguments which can be, and have been, urged in favour of each of these theories in turn. Yet, anxious as we all are for the improvement of architectural education, I do not think these theories need trouble our minds very much, or cause us to hesitate in what we are doing, even if it does not fall in exactly with any of them. The fact that apprenticeship has an immensely strong hold upon the profession, and that, notwithstanding its many abuses, it is on the whole a good system, with many advantages, makes all talk of superseding it useless for the present, even if it were possible to prove that what we should substitute would be less open to objection. At the same time, all that we have been doing for the last forty years, and all that others have been doing recently, proves beyond a doubt that apprenticeship is not, as regards architecture, so all-sufficing in the latter half of the nineteenth century as it once was, and that there is a real and urgent call for something in addition. On this ground the Association has always taken its stand, and does so still. We aim no blow at pupilage, but we desire to provide means whereby the necessary knowledge and training, not to be obtained in the course of office work, may be accessible to those who join us. Among these means, classes and lectures, and our newly instituted drawing and designing school or studio, are not the only ones, although they are perhaps the most important. It must not be forgotten that we have a library which is, I believe, the largest and the most nearly complete architectural lending library in the kingdom. Our books are also accessible to members for reference when not out on loan, and a recent munificent donation will enable us to largely increase the number available for this purpose. I cannot too strongly urge upon you all to make all possible use of these books. Whether it is that the use of the pencil has such superior attractions, or whether it is an exaggerated notion of the comparative uselessness of mere "book-learning," I know not, but too many students of architecture, I am afraid, read but little, and that little probably only when it is needed to enable them to pass some examination. This is a great mistake; even if there were nothing to be learnt from books which might not be better learnt in some other way—which is far from being the case—still, reading exercises the brain and stimulates thought and imagination in connection with a subject. Even desultory reading is of use in this way; but the systematic study of the literature of a particular subject is obviously infinitely better.

Another of the most useful of our institutions is our system of visiting works in progress. These are usually among the most important buildings being erected in London at the time, and the opportunity of seeing for yourselves how they are being put together and what their architects consider to be the best ways of doing certain things, the best methods of construction and the best means of heating, ventilating, lighting, draining,

and so on, is an advantage which can hardly be estimated too highly. Our visits to old buildings, especially when they are buildings not otherwise readily accessible, are no less useful and are even more attractive. The annual excursion of a party to some district of architectural interest in England or abroad is as enjoyable as it is improving to those who take part in it, and I am surprised that the number of excursionists does not increase; the expense is really very small, and would be less if more joined, but notwithstanding the immense increase in the muster-roll of the Association, this number remains always about the same as it has been for many years past. It may encourage some of you to know that several comparatively younger members came with us this year, and I am bound to say that among them were some of the best sketchers, and that, as far as I could see, they enjoyed themselves and did as much work as the old hands. Whether or no the proposal to organise a junior excursion, which fell through last year, will be revived I cannot tell—I believe that by some it is not thought desirable; but for my own part I fancy good might certainly result if some of the junior members could agree to spend a few days together in studying some work of interest at a distance from London, provided, of course, that the scheme were properly thought out and carefully organised.

Another circumstance which has often surprised me is that the Sketch-book published by the Association does not share, as it should, in the general progress by attracting a larger number of subscribers; the value of the plates as records of old work, owing to their size and to the large number of drawings and sketches from which the subjects are selected, and owing to the care exercised in their selection and reproduction, is out of all proportion to the cost and would seem to deserve more recognition. Recently Mr. Lewis, one of the editors, has expended a great amount of time and labour in collecting and attaching to the plates a variety of authentic information, especially dates, which should further recommend the publication to you. One of the humbler, but not the least useful, of our institutions is our register of assistants who want work. It is an institution through which, I believe, many principals and assistants have been brought together to their mutual benefit and satisfaction.

Above and beyond all other means by which we strive to carry out our objects, our fortnightly ordinary meetings are the most ancient, and still one of the most important. I could wish to see these meetings better attended than they have been sometimes lately. I should like to hear the discussions more lively, and the chat in the room after the meeting more general. The papers which we are promised this year ought, from their titles and the names of their authors, to be at least as interesting and instructive as any we have ever had, and I venture to express a very strong hope that both senior and junior members will make an effort to come as often as they can and to contribute as often as they can to the discussions, by giving us their opinions or by relating what they know on the subject, or by suggesting points on which the lecturer might give fuller information. I remember that in past times a good many questions used to be asked of the lecturer by the younger members, and I hope the custom will be revived; it is an easy way in which to join in the discussion, and may often be exceedingly useful in eliciting information. I hope, too, to see the old custom revived of exhibiting some of the class work—it will now be the studio work—in the room on these occasions. I think, with a very small effort on the part of individuals, our ordinary meetings might be made the means of drawing us all more closely together—we should at least get to know each other's faces better—and really good discussions on the subjects of the papers could not but be of the utmost benefit to all.

To return to our classes. It may seem full early to think of another step forward, and it is not with any hope that it will be possible to undertake anything more for some time to come that I venture to make a suggestion, but only that it may be borne in mind if ever opportunity should allow of its being acted on. The step I refer to is the addition of a little workshop practice to our curriculum. I have mentioned before the theory that an architect's training should be mainly in the workshop, or, as those who have recently advocated the system put it, that the architect should be trained as a craftsman rather than as a professional man. This view is no new one, but the support which it is just now receiving in some quarters is exceptionally strong, and, because we do not at once accept it, one or two gentlemen have declared, if I do not misunderstand them, that they will have nothing to do with us. There can be no doubt whatever that those who are so enthusiastic in this matter have this much right on their side, that it is of the greatest consequence that an architect, among other acquirements, should have a thorough knowledge of his materials, and of how they are or can be dealt with; but I think a great mistake is made when it is supposed that this necessary knowledge can only be acquired by bringing up an architect mainly as a craftsman himself. I fancy I see, too in such a system a great danger of narrowing the thoughts and ambitions of our students, and of further exaggerating the faults which are already too apparent in our architecture—I mean the sacrifice of breadth and largeness of conception to mere littlenesses and prettynesses. The attention which we have for the last fifty years given to detail, first to mouldings, then to decoration, then to furniture and wall-papers, and fittings and pretty bits of all sorts, have made many architects among us equal, if not superior, to the architects of any other age in these matters. Those, and they are many, who have such skill are in the right in being proud of it; but we must not act, or even talk, as if skill in designing a sideboard or a wall-paper, a finial or a window-fastening, were the chief thing to be aimed at in an architect's training. An architect's first thought, his best work, must be given to his building as a whole; he must learn to grasp all the larger artistic and other problems presented by it, and deal with them in a large and comprehensive way, treating details as incidents, with all the care that their importance in the design entitles them to, but on no account giving them the first thought or greatest consideration.

I have been led into a digression by the suggestion which occurred to me that some day we ought to give our students the opportunity of a little workshop practice, say at least in joinery and metalwork, not with any idea of making them skilled mechanics, but to show them, in the most practical way, how wood and various metals can be dealt with. At present, we have no time, no accommodation and no money for this branch, but if some day we can appropriate two or three hours a week in the afternoons to our classes, and if money can be found, I think we should do well to remember the workshops. As regards day classes, the claims of which were rather strongly urged at one time, they have not been forgotten, but the practical difficulties in the way, and especially the expectation that the evening classes alone would at first tax all our powers of organisation and management, have led to their omission from our present programme. Meanwhile the studio, as a beginning, is to be open all day, and some few students have already intimated their intention to use it, either every day, or on certain days in the week.

Besides the financial help already promised, there are two ways in which I think that the Institute might possibly be able to assist us very materially at the present moment, to make our new classes useful and popular, if they were asked to do so. The first is this. You will notice that, although the Institute examinations are held in March and November, our course finishes at the end of May; this we cannot very well help; we can neither very well begin our work two months earlier, nor can we get it into six months instead of eight. I do not know if there is any especial reason for holding the examinations in the months named, but if there is not, or if any difficulty in the way of a change could be overcome, it would obviously be a great advantage if the date of one or both examinations could be altered so that one should fall in June, after the conclusion of our course. I have heard already of cases in which students preparing for the examinations have felt unable to join our classes because their studies would not be finished by March, and they cannot afford to be kept waiting for five or six months. The other way in which the Institute could help us would be by a declaration that, up to and including the first qualifying examination for the Associateship after the end of May 1893, candidates for that examination would not be required to have passed the intermediate examination. I believe, from what I have heard, that students who have not yet passed the intermediate examination have been, up to the present, deterred from taking our third year course by the fear that the qualifying examination would be closed against them before the end of their two years' study with us. I think we should do well to approach the Institute with a view to finding out if these two matters could be arranged as I have suggested.

I would ask our new lecturers and instructors and students to remember that they are in a sense pioneers, that their zeal, their industry, and their conduct will form precedents for the zeal, the industry and the conduct of their successors, and on their success or failure in achieving what they attempt will in no small degree depend the success or failure of the Architectural Association in the future. I beseech them to bear this in mind throughout the year, and to let it act as an additional spur to their exertions.

I believe I should fail in my duty to those of you who are on the threshold of the architectural profession if I failed to repeat the warning so often given on these occasions by asking each of you to consider well before you go too far, and to turn back, if necessary, before it is too late. I can scarcely hope in the time at my disposal to prove it to you, but you must take my word for the fact that with most men architecture as a profession has far more attraction for the romantic ambitions of youth than for the soberer sense of middle age; I ask you to remember this, and to make allowances to yourselves for it before you finally decide upon going forward. If you have the artist's love for art or his pride in the creations of his own imagination, and, to gratify this feeling, are satisfied to lead a life of self-denial, and of incessant labour and worry and frequent disappointment, you will, if you are moderately successful, find the life of an architect not bearable, but happy. But if you wish

for fortune or public fame, believe me, you can win neither among us. If you are determined to go forward remember the saying of the Hebrew King, "Whatsoever thy hand findeth to do, do it with thy might." If you will be an architect make up your mind, both for your own sake and for the sake of architecture, to be a good one. Do not trouble yourself with unnecessary conundrums as to whether architecture is an art or a profession; do not dub yourself either an "artistic man" or a "practical man," but be satisfied to be merely an architect, armed at all points, able to devise a building beautiful to the eye and adapted in all ways to the purpose for which it is required, and equally able to get that building erected with the materials and workmanship best adapted to the circumstances of the case, and without its costing more or taking longer to build than it should do. Before you can do all this you have years of hard study before you. You have your eye, your mind, and even your hand to train. You have a number of facts to assimilate, and probably certain habits to form, without which you would almost certainly get into difficulties that would overwhelm you. I do not tell you this to discourage you, but only to show you the necessity for constant application.

Begin by devoting a considerable amount of your time to learning to draw well and rapidly, not only with the aid of a drawing-board and T-square, but also, and perhaps especially, without any other aid than a piece of paper and a pencil. Drawing is more necessary to an architect than Latin is to a lawyer; it is the language in which he can most readily express his ideas and record his impressions, and until you have obtained the mastery of your pencil you will find several of the most delightful and useful avenues of study closed to you. At the same time do not forget that for you drawing is only a means to an end, and not the end itself. Do not let the pleasure you will find in the use of your pencil lead you to be satisfied to spend your time in making pretty drawings merely for their own sake, or you will, instead of becoming an architect, be in danger of becoming a mere draughtsman. Meanwhile, cultivate your sense of the beautiful by as frequent a contemplation of beautiful objects, especially architectural objects, as you can compass; do not neglect pictures or natural scenery, or indeed anything which moves you to admiration; stimulate your eyes to carefully observe and your mind to analyse these objects, in order if possible to ascertain the source of their charms. Strive to stimulate your inventive faculties and your powers of reflection and original thought by setting yourself problems, and endeavouring earnestly to find the true solutions of them.

Do not neglect to store your mind with all facts which may be of use to you. The object of our lectures and classes is to give you the most important of these facts in a form as concise, and as easily understood and remembered as possible, but there is much that with the best will they cannot give you. Here again your powers of observation, of analysis, and of reflection must be brought into play; visit buildings in progress and workshops whenever you can, watch the men, examine the materials, question the foreman, ascertain the usual way of doing certain things, and if possible why they are so done, and take all opportunities of comparing the drawings and the specification of a building with the work on the spot, in order that you may the better understand the connection between the actual work and the representation and description of it. Make yourself acquainted, too, as far as you can with all the business of the office in which you are engaged, and with the manner of conducting it. Finally, do not fail to test your progress, if only for your own satisfaction, by means of the Institute examinations. If you do all this you will in a few years become a competent architect's assistant; and if you persevere in the same course for a few years more, you may then venture to undertake any little work on your own account with which you can get anyone to entrust you; but do not be in a hurry to accept any such responsibility, that is, do not try to practice for yourself too soon; I believe that many a man has ruined his prospects by this fatal step. It is so pleasant to be your own master, and to be an architect instead of a mere assistant; but it is, at the same time, so easy to fail for lack of experience, and to get a character for incompetence which it may take years to get over, if it does not affect your whole career.

While striving to perfect yourself as an architect, do not, as you value your peace of mind, your reputation and even your success, neglect your character as a man; cultivate courage and energy, perseverance and patience, and keep in mind the oft-quoted advice of the late Professor Cockerell to be "an artist among gentlemen, and a gentleman among artists." Strive to be as honest and true in your inmost thoughts as you are in your dealings with others; shun all affectation of opinion as you shun affectation of manner; shun, too, that vanity and the pharisaic spirit too common among us, which leads a man to think himself the superior of others who happen to be of a different profession or to hold different opinions. Be forbearing and courteous in all your dealings with the world, and never believe ill of others if you can help it.

In conclusion, cultivate that spirit of fellowship with your colleagues and fellow-students which it is one of the chief aims of this Association to foster; do not neglect the opportunities it affords you for forming friendships with some of the nearly 1,200 members who compose it, and, if possible, make the Association your creditor by taking some part in the good work which it is doing, and will, I hope, continue to do in the future. If you would reap the full benefit of your membership, identify yourself with our work, and be ready to exercise a little self-denial for the general good. This is the spirit which has animated the Architectural Association in the past, and has enabled it to perform what no other society of the kind has ever attempted, and this is the spirit which must animate it still. Believe me, if you act in this spirit you will never regret it, but will rather consider the honour and pleasure of having helped in such a work so great that you will say what I say now from my heart, namely, "I owe more to the Architectural Association than I can ever hope to repay."

Mr. MacVicar Anderson, president of the Institute of Architects, said he had taken the invitation to be present at the opening meeting as a compliment. Neither he nor any older members of the profession would be the worse for meeting with the young men of the profession; it would inspire them with some of the enthusiasm and vigour that was associated with youth. It had afforded him pleasure to be present, and to have listened to an address that was both interesting and able. Naturally the address had been devoted in considerable part to the subject of architectural education, and rightly, as nothing of more importance could have occupied their time and thought. They were by this time all familiar with the features of the new curriculum. It had been criticised as too wide and too diffuse in its scope. Such critics forgot what an architect was. A painter, a sculptor, a lawyer and other professional men had their studies limited. An architect, on the other hand, was a sort of hybrid creature, a man of business, an artist, and also a practical man. In wishing the new curriculum well, he hoped that what had been the great characteristic of architectural education, namely, office training, would never be submerged. The advice given in the address was admirable. But on one point their President was not competent to speak, viz. in regard of men of middle age. Their President was not old enough to speak personally. He (the speaker) was now verging on the sere and yellow leaf, and years had only confirmed him in professional love for his work. In his opinion fortune and prizes were open to those who adopted the profession with pure affection for architecture. He could not be expected to give an opinion as to the action of the Institute of Architects, but their President was a member of the Council, and his suggestions would be received with all favour and consideration. The aims of the two bodies were the same, though the functions of the two were very different.

Professor Kerr congratulated the President on his very able and eloquent address, which he said was a useful one not only to the members of the Association, but to the profession at large, who were equally interested in the success of the work of the Association. Professor Kerr noted, as a remarkable fact, and one peculiar to the architectural profession, that so much had been and was being done, and successfully done, for architecture by students. There might be peculiar circumstances attaching to the architectural profession—he would not go into that subject now—but whatever the peculiarities that did attach to the profession it was a matter of pride that the work of the students, who forty-five years ago had started on their career of education, had been carried on so steadfastly. Adverting to the number of students of architecture, those in the Association, those in the Institute of Architects, and many others outside both bodies, the question arose, What would become of them all? It was easy to express an optimistic opinion, and it was equally easy to give a pessimist opinion. The opinion he had held for years was that all students of architecture would not become practical architects. As time went on the number of students who become practical architects or assistants diminished. An architect's office, he thought, was the best school for training a votary of art. He could mention the names of many who had become distinguished in architecture, and the names of many who had drifted into the auxiliary arts, or, as they used to be called, the subsidiary or minor arts. These arts were not only most pleasing to pursue, but they were most profitable to pursue. The whole field of industrial design was open to the architectural student of the day. The architectural student trained in an architect's office acquired artistic knowledge of the philosophy of design, which was altogether different from that superficiation of design that characterised the goods in the shops of upholsterers, design that was perfect rubbish.

Mr. Aston Webb, in the course of his remarks, expressed his entire approval of the enlarged aims of the Association, and praised the arrangements of the studio in Marlborough Street. The classrooms and all appliances were admirable. He did not uphold the idea of paying students' fees for them. In many cases students valued advantages so offered them too lightly.

A vote of thanks to the President for his address, proposed by Mr. MacVicar Anderson and seconded by Professor Kerr, was put to the meeting by Mr. Leonard Stokes and carried by acclamation.

The President having replied, the proceedings terminated.

HAM HOUSE: ITS HISTORY AND CONTENTS.*

Of all the Surrey houses, this perhaps claims the strongest association with history, and our Society may be congratulated on having, through the courtesy of the Earl of Dysart, obtained permission to view a mansion hitherto regarded as an almost inaccessible treasure-house of antiquarian and artistic fame. The annals of its ownership are to be traced to Sir Thomas Vavasour, Marshal of the Household, who, in 1611, was appointed Judge of the Marshal's Court, conjointly with Sir Francis Bacon, afterwards Lord Chancellor.

The house would seem to have been finished in 1610, as that date, together with the words "Vivat Rex," is seen on the ornamental carving over the front door of the principal entrance. Subsequently, the house and its lands were secured to John Ramsey, Earl of Holderness, who died in 1624 or 1625, and who was created Lord Huntingtower and Earl Dysart by Charles I. It may be in memory of this honour that we notice among the several busts around the façade of this house one of that monarch. The eldest daughter of the above Earl Dysart married Sir Lionel Tollemache, Bart., of Helmingham, in Suffolk. This lady gained great influence at Court during the Interregnum, and she obtained a new patent from Charles II. (1660), whereby she was created Baroness Huntingtower and Countess of Dysart. Sir Lionel Tollemache died in 1669, and in 1671 the Countess married John, Earl of Lauderdale, afterwards created duke. He died in 1682, and his property, after being in the possession of his widow, devolved on her death in 1698 on her eldest son, Sir Lionel Tollemache, Lord Huntingtower, and has ever since continued in the possession of his descendants. Subsequently to the above period, several conflicting claims about the estate have taken place, almost down to the present time. The property is now vested in the Earl of Dysart, who entered into possession in May 1890.

Intimately connected with the house is the manor of Ham,† once a part of the royal domain, Henry VIII. having granted it to Anne of Cleves in 1540, as well as that of Petersham and Sheen, the whole being Crown property. We learn that Charles I. gave to Sir Wm. Murray a lease of this manor in 1636 or 1637, and created him Baron Huntingtower and Earl of Dysart in 1646. After the Restoration, in 1660, Charles II. granted to Sir Robert Murray a large extent of ground and the manors of Ham and Petersham in trust for the daughters and co-heirs of the late Earl of Dysart. The said manors then devolved on John, Earl of Lauderale, who married the widow of Sir Lionel Tollemache, the famous Elizabeth, Countess of Dysart, whose portrait hangs on the walls of this celebrated mansion.

The best and generally-known view of this house is from the Thames, and as approached by the meadows from the river the brick façade is before us, whose mellowed tints form a pleasing contrast to the sombre yew-trees and foliage which surround the main entrance.

The principal front is of brick, with stone dressings. Two projecting wings support either side of the doorway, which is flanked by arcaded recesses. These and the terrace walk give this part of the house some resemblance to Bramshill, in Hampshire, a famous Jacobean structure of the same period, but of greater richness of design and detail. The entrance doorway, supported by two marble pillars, is a good example of Renaissance work, which is more fully displayed in the decorative scrolls on the base of the pillars. The date, 1610, and the words "Vivat Rex," are seen in the upper portion of this doorway, and initials "T. M. V." for the builder. The principal approach to the house from the Thames is rendered more impressive by the large iron gates, and in passing along the garden walls are oval niches, containing busts of celebrated men, some twenty in number, made of lead and painted stone-colour. This decoration is carried out somewhat in the same way at Hampton Court Palace, where, in the garden front of that building, are busts of the Roman emperors, sculptured in terra-cotta. In the centre of the garden at Ham is a colossal and emblematical figure of the River Thames, executed in stone. We now, after surveying the principal front of the house, enter the great hall, an imposing and elegant structure, paved with black and white marble, and surrounded by an open gallery above, which leads into the different apartments. The general effect of the hall is striking, enriched as it is with old family portraits, antique furniture and china. We can, however, notice only the principal paintings, which are as follows:—1. *Louisa, Countess of Dysart*, by Sir Joshua Reynolds; 2. *Charlotte, Countess of Dysart*, by Sir Joshua Reynolds; 3. *Lionel, Third Earl of Dysart, and his Countess;* 4. *Lady Huntingtower*, by Sir G. Kneller; and others.

Passing through the hall, we turn on our left into a small private chapel, neatly panelled throughout, lighted by two windows, which are placed somewhat high up on the walls. On the communion table among the service books is a Prayer Book, the gift of Charles I. to William Murray, Earl of Dysart; on the covers the royal arms are wrought in gold and silver filigree work.

Retracing our steps into the hall, the great staircase leads to the state rooms above, all of which have their own rich artistic beauty and historical importance. The carving of the balusters on the staircase is worthy of notice, military trophies, shields and arabesque ornaments being gracefully intertwined, and forming a good specimen of the wood-carving for which the seventeenth century was famous.

We next enter the Round Gallery, overlooking the hall, and here are placed choice examples of china, antique vases, cabinets, and on the walls hang several family portraits, among which can be mentioned:—1. *The Dukes of Lauderdale and Hamilton*, by Janssen. 2. *Lady Worseley*, by Kneller. 3. *Duke and Duchess of Lauderdale*, by Sir Peter Lely. 4. *General Tollemache*, in armour; he was wounded when commanding an attack on Brest Harbour, 1694. 5. *Sir Lionel Tollemache*, and others. Besides portraits can be recognised paintings by Vandevelde, Wouvermans and like masters of the Flemish school; also by Watteau and other artists.

The series of rooms called the royal apartments next claim our attention, and this appellation may have arisen from the fact stated by some historians, "that the Court for the king is kept at Ham House." The proximity of Richmond Palace may very possibly have caused the visits of royalty to be made to Ham, and hence the association of the word "royal." Ham House was for a short time a royal residence, and Prince Henry, the eldest son of James I., dwelt here during part of his brief life. In the different rooms we now examine, is such a wealth of Jacobean furniture, paintings and other artistic gems that Ham may justly rank with such well-known houses as Knole and Penshurst in Kent, Petworth and Parham in Sussex.

Entering what is called the North Drawing-room, we find it hung with tapestry and decorated with an ornamental plaster-ceiling, enriched with gilt scrollwork. In this room are copies of Raphael's cartoons, possibly wrought at Mortlake, where Sir Francis Crane had established a tapestry manufactory, which was patronised by James I. and Charles I. The chairs here are replete with old embroidery and rich artistic design.

Before entering the Long Gallery, note the small but richly-decorated room in which are many fine miniatures, amongst them one of Catherine Bruce, wife of the first Earl of Dysart, painted by Hoskins in 1658. In a small cabinet is an authentic lock of hair of Robert Devereux, Earl of Essex, the ill-fated favourite of Queen Elizabeth.

From this room the Long Gallery is reached. This apartment is perhaps the most striking of all in the mansion, and may favourably compare with the famous Cartoon Gallery at Knole in Kent. This room, 80 feet long, is hung with portraits, chiefly by Vandyke and Sir Peter Lely, and its panelled walls are charmingly set off by the various inlaid cabinets and tables, carved and antique chairs, wrought in rich damask and other material and by many artistic treasures. Of the portraits of greatest interest and connected with the traditions of Ham the following may be selected:—1. *General Monk.* 2. *Sir Lionel Tollemache* (Lord Dysart), by Vandyke. 3. *Charles II.*, by Sir Peter Lely. (It is said the King sat purposely for this picture for the Earl of Lauderdale.) 4. *Sir Harry Vane and Charles I.* (Vandyke). 5. *Countess of Dysart.* This picture is known from others of the same lady by a black boy with fruit being introduced on the canvas. 6. *Elizabeth*, Queen of Bohemia, daughter of Charles I. Also portraits of Henrietta Maria, Lauderdale, and last, but not least, the artist Vandyke himself. It should be noticed that this Long Gallery measures the depth of the house from north to south, with a bay window at each end.

From the rooms on the south side of the house, on which we are now supposed to have entered, a view of the extensive garden and lawn is obtained, backed by dark firs and other foliage, and in the distance are seen the large iron gates, which once formed the main entrance, and are now disused.

These gates are of ornamental design, of the time of Charles II.; over the centre are the Lauderdale arms. In the far distance are seen the Ham avenues, almost a mile in length.

We now reach the room known as the Cabal Room, so called from the five ministers (Clifford, Arlington, Buckingham, Ashley and Lauderdale), whose initials make the word "Cabal,"

* A paper by S. W. Kershaw, F.S.A., hon. member, Société des Antiquaries de Picardie, read at the meeting of the Surrey Archæological Society, October 3, 1891.

† It may be in the recollection of our readers that the late Sir Gilbert Scott resided for a few years at the Manor House, Ham.

having held their secret cabinets here. In this and the adjoining apartments are to be remarked the fine marble mantels sculptured in relief, the inlaid floors, and the abundance of tapestry and silk hangings.

The Queen's Audience Chamber contains tapestry after Watteau of pastoral scenes, while the Duchess of Lauderdale's "boudoir," which adjoins the Cabal Room, is much to be noticed. On the polished parquet floor is the monogram "E.D.L.," surmounted by the ducal coronet, and at the end of this room are two handsome armchairs, under an arched recess, and which tradition assigns to the Duke and famous Duchess of Lauderdale. With the adornment of this part of the mansion must be associated the celebrated Countess of Dysart, who in 1672 married the Earl of Lauderdale, and it is said her influence had been greatly exerted over him in political matters. During the Interregnum she obtained so much power as to obtain a new patent from Charles II. in 1660, whereby she was created Baroness Huntingtower and Countess of Dysart. Her ambition and domineering spirit caused her to be disliked. She had a restless spirit, lived at great expense, and died in 1698, having survived her husband, Lord Lauderdale, sixteen years. It must, however, be conceded that much of the decorative richness of Ham House owes its origin to this lady, whose admiration for the arts is well known. It may not be inappropriate to mention a small picture-room, whose carved ceiling was painted by Verrio, and whose miniatures and cabinet pictures form a very treasure house of art. Here are likenesses of Queen Elizabeth by Hilliard, also of Mary Stuart, Charles XII. of Sweden, Mary d'Este (second wife of James II.), Louis XIV., by the famous artist Petitot, and several others. Descending from the upper to the ground floor, we find many apartments of interest, but hardly of such artistic merit as those which in this brief sketch I have been enabled to give you an outline. Other "stately homes of England" may possess collections more rich and rare, but Ham House claims especial importance as retaining all the traces of bygone history just as it was at this present day, and the county of Surrey may be proud in reckoning within its boundaries such a time-honoured mansion.

It would be incomplete were I not to mention the celebrated library, where rare Caxtons and other volumes have made the fame of the Ham collection known to all bibliographers. Among some of the Caxtons here may be noted Chaucer's "Canterbury Tales" (first edition), "The History of Godfrey of Bologne," "The Life of Jason," "The Mirror of the World" (first edition), "The Polychronicon," "Tully on Old Age," and "The Life of St. Winifred." Also a unique copy of the "Governail of Health."

When our survey has been made and the central hall again reached, one is irresistibly carried back to the times in which these houses were built, and to the influence and surroundings which prompted their erection. The early part of the seventeenth century witnessed the growth or commencement of several English houses of note. Bramshill in Hampshire, Hatfield, Audley End, and Charlton in Kent, may be named as some of the leading examples, while a number of smaller buildings were in course of construction. Inigo Jones was a ruling favourite. He was surveyor to Prince Henry (son of James I.), and his visits to Italy had not been without their influence on English art and architecture, in giving what could almost be called a second Classic revival and a foreign touch to many a detail of Jacobean work. All the buildings about England showed a tendency in this direction. The Universities of Oxford and Cambridge had Classic portions in many of their designs, which asserted themselves in several other examples, both in London and elsewhere. Later additions or alterations to such structures would constantly occur, and one is tempted to think this had been the case with the north or river front of Ham House, and that the projecting bays at each end had been once much more decorative; and this theory is supported by the fact which is known that the house was much enlarged in the time of Charles II., the garden front having been then erected by the Duke of Lauderdale, of whom we have before heard, as well as his wife, the famous Duchess. Whatever impressions such a house as this may leave on the mind, certainly it is of the wealth of art united with much that is historical, and it is a matter of congratulation that such buildings exist in a way we do not find on the Continent, and that they have escaped to a great extent the ravages of revolution and civil war.

Jacobean structures, such as Ham House and others, were but a sequel to those grand Tudor mansions which had sprang up so mightily over our land, and gave evidence alike of building skill and enterprise. Such houses have helped to form the history of our country and people, and in the altered conditions they exhibit in their structure we only see another interesting phase of art adapting itself to more modern requirements. The revival of letters had synchronised with the new ideas of the period, and in the joint re-birth, as it were, of art and letters we recognise one of the great moving forces in English Mediæval life so forcibly expressed in the pages of the late accomplished historian, J. R. Green. Though Ham House is of a somewhat later century, it is no less important as a link in artistic history, and fully illustrative of the ancient homes of "Merrie England."

ST. MICHAEL'S STEEPLE, COVENTRY.

THE request of the church authorities, "That in order to preserve a permanent record of the extent to which St. Michael's steeple leans towards the north-west, Mr. Councillor Andrews be requested to mark two points upon the pavement of the tower," has been carried into effect by him, with the assistance of two churchwardens to help in taking the measures. Our forefathers who constructed these splendid buildings, says the *Coventry Herald*, had no notion of cast-iron exactness. For instance, the clerestory windows appear to be of the same size and pattern. Yet during the restoration it was found that no two were exactly alike. A similar state of things is the case with the tower. Its four walls are of unequal lengths, and consequently it is not an exact square. The western wall is about 3 inches longer than the eastern wall. Therefore the method of finding the centre of a square by drawing diagonals between the four corners was not applicable in this case. The centre of the tower was consequently found by measuring at right angles from the centre of the four side walls. Measurements were then made from the side walls to discover the point occupied by the plumb-line when suspended from a point 267 feet from the ground, and the point beneath the centre of the weathercock, 290 feet high, was then adjusted, and two small holes drilled in the pavement, one at the centre of the tower and the other under the centre of the weathercock. The distance apart is 3 feet 5½ inches. Finally, a true east and west line was marked upon the pavement. The sides of the tower do not correspond with the four cardinal points. The new ordnance plan of the city shows a deviation of 9 deg. A line was therefore drawn centrally through the tower from the middle of the west wall to the middle of the east wall, and 9 deg. set off from the central point with a protractor. This was then tested by a compass, and, allowing for 18 deg. of magnetic declination, the line was found to be exact. The two points on the pavement are to be marked by brass plates, the one at the centre will be star-shaped, with the points adjusted to the true cardinal points.

Correspondence

Greek at the Universities.

SIR,—It has been announced that a grace will be offered to the Senate of the University of Cambridge on Thursday, October 29, at 2 P.M., appointing a syndicate "to consider whether it be expedient to allow alternatives, and if so, what alternatives, for one of the two classical languages in the previous examination, either to all students or to any classes of students other than those already exempted." As members of an executive committee, appointed last August by a meeting of resident graduates to oppose this grace, we trust you will permit us to offer, through your columns, reasons which, in our opinion, are sufficient to justify the course we propose to take.

1. The adoption of an alternative for one of the two classical languages in the arts' course at the Universities would tend to the extinction of the study of Greek in all but the greater public schools. A knowledge of Greek would thus cease to be within the reach of the sons of many professional men, and of the middle-class generally. In the interests of the smaller schools and of parents of limited means, we deprecate any change which would eventually place it among the luxuries of the rich. The whole history of education shows that the study of Latin has never flourished apart from the study of Greek.

2. We know of no alternative which may be regarded as a worthy substitute for a classical education. Experiments which have been tried are at once too recent and too indecisive to justify legislation upon the basis of their results. If not ideally perfect, the present system possesses advantages which cannot be claimed by any other with which we are acquainted. It has been matured by long use, it supplies a training which is definite and precise, and yet subtle and refining; its tendency is to widen the range of thought and to counteract the too exclusive interest in present and visible surroundings, which is a growing danger of modern life.

3. Beside its educational value, the study of Greek has a quite unique importance in connection with literary and scientific work, which forbids us to regard with equanimity a proposal to dismiss it from the place it has held in England since the sixteenth century. We regard the Greek language and literature as the ultimate basis on which all literary study, in the highest sense of the word, must rest. Nor can we forget

how largely the language and thought of ancient Greece enter into other subjects of knowledge. The loss of Greek could not fail to make itself felt in every profession; and, in particular, it is scarcely necessary to point out how serious a misfortune it would be if many candidates for holy orders should have received no training in Greek.

4. Those who desire a change, while commonly admitting the educational and professional importance of Greek, allege several reasons why, under present circumstances, some alternative for Greek should be allowed. We ask leave to deal with the weightier of these arguments in as few words as possible. (*a*) It is contended that modern requirements have brought so many new subjects into the course of schoolwork, that no room is left for the teaching of Greek. But the proper end of school life is to educate the mind rather than to fill it with facts; and all experience goes to show that schoolboys who have followed the old classical course are at no disadvantage in their future life, as compared with those who have taken modern subjects in lieu of Greek. (*b*) It is urged that the amount of Greek that can be required in the previous examination is so small as to have no value. If this argument has any force it applies equally to all the subjects in the previous examination. But even an elementary knowledge of Greek has an educational value of its own, not always recognised by the student himself, but not on that account to be overlooked; and it may always be carried farther at a later time in life by those who have made a beginning. (*c*) It is urged that men who have not had the advantage of a classical education at school suffer hardship by being excluded from the older Universities. But it seems sufficient to answer that the loss incurred by such students is not to be compared with that which would ultimately arise from the abandonment of Greek. And students so circumstanced can obtain the advantages of a University training and degree from other academical bodies, which do not require a knowledge of both the classical languages. (*d*) Lastly, if it be asserted that the progress of the science school in Cambridge is hampered by the requirement of two classical languages, we reply that the growth of that school during the last ten or twelve years is the most notable feature in the recent history of the University.

5. Many who have followed us so far will demur to our purpose of offering opposition at this early stage. It will be said that the appointment of a syndicate pledges the University to nothing beyond discussion. But the subject has been discussed in Cambridge more than once. In 1870 and again in 1878 a syndicate was appointed to consider this question, and the deliberations of the second syndicate lasted a year and a half. On each occasion, although the syndicate reported in favour of change, the Senate refused to sanction it. It may be urged that the last of these decisions was reached eleven years ago. But there is no reason for supposing that a third syndicate would have fresh arguments to lay before the Senate. And, in another shape, the question of Greek has been again decided by a recent vote of the Senate. Within the last two years the entire system of pass examinations has been laboriously revised, and, after a vote, both classical languages were retained in the general examination. Under the circumstances we submit that the present demand for a reopening of the question is not justified, and we cannot but regard as mischievous the expenditure of time and the agitation it would involve.

We rejoice in all signs of true progress, but we are convinced that the abandonment of Greek as an essential factor in a liberal education would be a retrogressive measure. We beg the non-resident members of the Senate who think with us to come up to Cambridge on Thursday, October 29, and record their votes against the grace in numbers which may not only secure its rejection now, but save the University from similar proposals for years to come.

C. Taylor. W. Robertson Smith.
H. B. Swete. A. H. E. Boughey.
R. C. Jebb. W. L. Mollison.
G. F. Browne. R. A. Neil.
John E. B. Mayor. J. Larmor.
Alfred Newton. W. Bateson.
J. W. L. Glaisher.

Cambridge: October 14, 1891.

A Model from Vienna.

Sir,—You have for years allowed me to plead in your pages for a more liberal use in the architecture of the City of London and of other fuliginous towns of those hard but beautiful and imperishable materials to which Phillips was, I believe, the first to give the name "pyrogenous," my argument being that the requisite machinery for their economical conversion having been invented, and railways and ships having penetrated almost into the heart of the quarries yielding them, all that was required to enable us to build with them as cheaply as with freestone, handsomely worked, was a suitable and characteristic mode of architectural treatment. Perhaps I ought now to be satisfied, for granite building is certainly in great favour in the City, and must inevitably command increased approval if the last requirement I have mentioned be secured. It is, I believe, an admitted axiom in design that each material must have its own special consideration. I have done something to illustrate this matter (*The Architect*, June 6, 1890), but I suppose the result was so novel, so rich in colour, and therefore would have been so subduing and even killing to surrounding drawings in the usual black-and-white rendering that the selecting committee of the Royal Academy refused to permit the public to see it. As I do not know the names of the committee I have not been troubled in spirit in the slightest degree. But to the object of this letter, "A Model from Vienna." I need not take up much of your valuable space, because most, if not all, of your readers will have seen the description in Monday's papers of the new museum of art in the Austrian capital. My purpose will be served by briefly and simply copying the names of the materials used—used externally, for my efforts to get porphyry, granite and other igneous rocks appropriately treated are entirely and solely applicable to outside work. The writer says:—"The new museum of art is an edifice which, by the magnificence of its architecture . . . is a glorious proof of what art in the present Emperor's reign is able to produce . . . the style and character are entirely modern . . . for those who wish to see the perfection of technical art, the display of wealth of colour, Vienna is the place to come to . . . red Swedish granite and the most valuable pink, grey, yellow and white marbles of Italy and the Alps have been used. The steps of the staircase from Carrara are 18 feet wide. The great columns are of brilliant noir antique. The smaller are of precious Porto Venere."

The opening of this beautiful museum is of the utmost importance to the entire art-loving world, for it contains under one roof all the treasures of art which the Imperial house has collected during the last 400 years. Baron Hasenauer is the architect, but Semper, I believe, had something to do with the design.

Streatham: October 20. Henry Travis.

The New Lock and Handle.

Sir,—In your description of the new lock and handle which you gave in your last week's issue, and which in the main was accurate, you omitted a most important point which by your kind permission I should like to supply, namely, that this patent lock is about 20 per cent. cheaper in its original cost than anything durable that has ever been previously made. This invention is the result of three years' thought and experiment of one of our largest timber-merchants, and the collection of locks which he has in his workshop, showing his ideas of a model lock in a crude state to its present perfect development, would interest any of your readers. In the company which will shortly be brought out, its history and advantages will of course be fully detailed. Will you kindly note that my name is not as inserted last week, but that I am, sir, your obedient servant, T. Freeman.

200 & 202 Phœnix Street, St. Pancras:
October 21.

Sir,—I read in your last issue of yet another new lock, which I heard of with regret, as ironmongers are already worried with the number and variety of locks they have to keep in stock. The new lock will have to be an exceptionally good one if it is to have any chance of competing with the admirable locks that are at present supplied by Chubb, Hobbs, Hart, or, coming to a cheaper article, those supplied by James Hill and others.—Your obedient servant,

Ironmonger.

CHURCH BUILDING AND RESTORATION.

Carshalton.—The corner-stone of a new chancel in course of erection at the old parish church of All Saints has been laid by the Duchess of Albany. The walls and roof being unsafe, thorough restoration aud repair was deemed to be necessary. The present church stands, it is believed, upon the site of one of the earliest churches built in England, and contains in its nave some traces of Norman work. But the whole structure has been altered and enlarged at such diverse periods that it possesses no particular style or harmony of its own. Sir Arthur Blomfield, A.R.A., is the architect of the new chancel, which is to be in Perpendicular style, and it is estimated that the additions and improvements will cost about 10,000*l*.

Ebbw Vale.—The fine church, Christ Church, which may be called the cathedral of the surrounding valleys, has been reopened, after undergoing elaborate alterations and improvements. The interior has been redecorated; the tower, which was not previously finished, has been completed, with new wooden floors, large double doors, and ceiling, windows glazed,

&c.; new handsome brass gas standards, a gift from Dr. Davies, have been fixed in the choir; and the Welsh church, underneath the chancel, has also been cleaned out, and finished in colour. The church has a large nave and aisles, with massive columns to the arcades, and a fine apsidal chancel a good height above the nave, approached by a flight of bold steps, giving the structure a lofty and good general appearance. The chancel decoration may be thus described :—The upper portion is in blue, resembling the firmament, with large and small gold stars dotted here and there ; the middle portion is of buff, with Indian red ornament separated from the top by a string of ornament (the True Vine) and with Tudor roses, &c., over the arches, while the lower portion is a series of crocketted gables on columns, with the arches and cusping under in green, red, purple, black and gold on a light red ground. The Crown of Glory is depicted over the altar between gables. The whole is carried out from designs and under the superintendence of Messrs. Kempson & Fowler, architects, Llandaff. The builder was Mr. W. Morgan, of Ebbw Vale, and the decorator was Mr. J. E. Morgan, of Canton, Cardiff.

Selby.—The abbey church at Selby has been reopened after restoration. The portions of the old church which have just been dealt with are the choir and north transept. Twenty years ago the nave was restored under the direction of Sir Gilbert Scott. The improvements just made have been carried out under the superintendence of his son, Mr. J. Oldrid Scott. The south-west wall and the clerestory above have been rebuilt, whilst the floor has been raised to the old level. The old miserere stalls have been restored, but the fronts are entirely new. The north transept has been underpinned, the lead on the roof has been recast, the arcading on the sides of the aisles has been attended to, and the parts of the edifice east of the tower have been thoroughly overhauled. There are other parts of the abbey still needing attention. Two hundred years ago a fine tower fell, demolishing the south transept in its descent. These should be rebuilt. The cost of the work has been about 8,000*l.*

St. Donat's.—The ancient Welsh St. Donat's Church, an interesting fourteenth-century church, has been reopened, after undergoing a thorough restoration. The old church was fast going to decay. The open oak roof (a fine specimen of construction) was dangerous, the plastering was perishing on the walls, the floor was damp and unhealthy, the windows were badly glazed, water came in through the tower, the tower itself was cracked and in an unsafe condition, and there was neither light nor heat in the church. In addition, Godwin's tile floors have been placed in the chancel, and a new wood-block floor under the chairs on concrete, a new oak pulpit, altar, lectern, font-cover and chair have been furnished, all the windows have been newly glazed in fret lead, new seats have been placed in the chancel, two new windows have been provided, &c. The cost of the entire work has been about 700*l.* The contractor was Mr. W. A. James, of Cowbridge, and the architects Messrs. Kempson & Fowler, Llandaff.

SCHOOL BUILDINGS.

Castlethorpe.—New Board Schools have just been opened. The schools are situated in the centre of the village, and are built of brick, with Bath stone dressings. The roof is of Broseley tiles, and over the principal entrance is a small tower and bell-cot. The rooms are adapted for the accommodation of about 150 children. The architects were Messrs. H. H. Dyer & Son, Newland Chambers, Northampton, and Messrs. Adnitt & Everard, of Rushden, were the builders.

Longsight.—The memorial-stone of the new Catholic Day Schools at Longsight was laid on Saturday, the 17th, by Sir Henry Roscoe, M.P , in presence of the Bishop of Salford. The schools are erected in Richmond Grove, consist of two storeys, about 100 feet by 35 feet, are faced with Ruabon stocks, and accommodate about 500 children. The contractors are Messrs. Wilson & Toft, of City Road, Manchester, and the architects are Messrs. Heathcote & Rawle, of 6 Princess Street.

Leeds.—Two new schools have been opened for the Leeds School Board. One is a day industrial school, situated in Czar Street, Holbeck, and the other an elementary school at Harehills, Roundhay Road. The principal contractors have been :—For the brick and masonry and carpentry and joinery, Messrs. Gould & Stevenson ; for the ironwork, Messrs. Taylor & Parsons ; for painting, Mr. G. Thompson ; for slating, Messrs. Atkinson & Son. The works have been carried out from the plans and instructions of Mr. Landless, architect to the board. The cost of the site was 1,221*l.* 17*s.* 4*d.*, and the estimated cost of buildings and fittings 7,000*l.*

Arrangements are to be made for lighting the Mansion House by electricity, at a cost not exceeding 1,500*l.*

GENERAL.

Sir James Kitson has presented *The Return of Persephone*, painted by Sir Frederick Leighton, P.R.A., to the Leeds Fine Art Gallery.

The Thirty-first Annual Exhibition of the Glasgow Institute of the Fine Arts will be opened on February 2 next, the Council having found it advisable to return to the old date. Acting in the interests of the artists who kindly contribute to the Exhibition, the Council have resolved to limit the number of works which each contributor may submit to two—the same as in the Paris Salon.

The Birmingham Art Circle opened their winter exhibition on Wednesday. Fifty-seven paintings and drawings have been hung.

The Royal Society of British Artists, at a general meeting held on Tuesday, elected Messrs. F. W. Davis and Sutton Palmer as members.

The School of Art Wood-carving, City and Guilds Institute, Exhibition Road, South Kensington, has been reopened after the usual summer vacation. One or two free studentships in both the day and the evening classes are vacant. These studentships are maintained by means of funds granted to the school by the City and Guilds Institute.

The Council of the Senate of Cambridge University recommend the acceptance by the University of the bequest of the late Mr. W. K. Foster of his collection of antiquities, and that the prehistoric and Anglo-Saxon portions be kept and exhibited together in the Museum of General and Local Archæology, and be designated "The Walter K. Foster bequest."

The Statue of the Queen, which it is proposed to have erected in London, is estimated to cost 12,000*l.* or 13,000*l.*, and designs submitted by several eminent sculptors have already been tentatively considered. Various sites have been suggested for the statue, but no site seems to find stronger support than a spot facing the Horse Guards parade, just within the railing of St. James's Park.

Mr. Alfred Gilbert, A.R.A., has been commissioned by the committee of the Bombay memorial of Sir George Birdwood to execute a bust of that gentleman in bronze for the Bombay University hall. A medal of Sir George Birdwood is also to be struck.

Mr. J. W. Tottenham has presented a collection to the Hastings Museum of the value of 10,000*l.*

Mr. Walter Merrett has been selected to execute a marble bust of the late Alderman Sir R. N. Fowler, M.P., for the Guildhall.

Probate Duty has been paid on 27,787*l.*, as the net value of the personal estate of Mr. Keeley Halswelle, R.I., A.R.S.A., 4 Albemarle Street, Piccadilly, and Stower House, Steep, Hants, artist, who died at the Hôtel de Lille et d'Albion, Paris, on April 12 last, aged fifty-four.

Manchester Society of Architects.—The awards of prizes in the students' competition have just been made by the Council. The Society's first prize of 10*l.* goes to Mr. Roger Oldham, and the second prize of 5*l.* to Mr. A. Jennison. Mr. H. E. Sterry has gained Mr. Holden's prize of five guineas.

Mr. George Reid, P.R.S.A., has been appointed a Commissioner of the Board of Trustees for Manufactures in room of the late Sir William Fettes Douglas.

Mr. C. Purdon Clarke, Keeper of the Indian Museum, has been appointed Principal Keeper in the South Kensington Museum, in succession to Mr. G. Wallis.

The Plans of Mr. Thomas W. Cubbon, architect, of Birkenhead, have been unanimously adopted for new lecture-hall and Sunday-school buildings in connection with Milton Congregational Church, Widnes, accommodation being provided for 550.

The New Pavement in the choir of Peterborough Cathedral is being laid down by Italian workmen. It is to cost 2,000*l.*, which will be paid by the Dean. A new reredos is also to be erected.

An Eiffel Tower and Winter Palace is proposed to be constructed at Brighton, and a limited company has been formed to promote the scheme.

The Surveyors' Institution will hold the first ordinary general meeting of the session 1891-92 on November 9, when the president, Mr. R. C. Driver, will deliver an opening address.

The Halifax Technical Committee are about to invite competitive plans for the erection of a technical institute in Hopwood Lane, on the west side of the People's Park.

A New Chapel has been erected at Hereford which has been ventilated by the "Climax" Ventilating Co., of 15 Great George Street, Westminster, S.W., whose direct-acting ridge ventilators have been used for the exhausting of the foul air, in conjunction with their improved air-inlets for the admission of fresh air.

The Architect.

THE WEEK.

The owners of insanitary property have reason to rejoice, for the Courts appear to be on their side. That their rusty ægis can still shelter abuses is evident from what has just occurred in Liverpool. Last year the grand jury condemned certain property because it was insanitary. Soon afterwards the value had to be determined. For that purpose the Board of Trade appointed Mr. Hunter Rodwell as arbitrator, and from his long experience as a leader of the Parliamentary Bar, his qualifications were undoubted. It was held, as a result of the inquiry, that when property is condemned by the local authority it cannot be occupied, and therefore ceases to have a rental value. That is a common-sense deduction from the action of the authorities, but it was not accepted by the owners of the condemned property in Liverpool, and the case was brought before the Divisional Court and the Court of Appeal. The decision of the superior Courts was, to put it shortly, that the arbitrator should not have considered the condemnation of the property, his business being the discovery of the market value. A surveyor would find a difficulty in comprehending the Courts' doctrine, for it is impossible for property to be unaffected in the market by circumstances that are notorious and of a depreciating kind. Purchasers of houses are only mortals, and are not given to abstraction; but their lordships suppose, no doubt, it is as easy to ignore the defects of property as to imagine the site on which it stands as having length and breadth but no thickness. The question of value of the condemned property in Liverpool was again ordered to be investigated by Mr. Rodwell, and the difficulty of his task will be understood from his own description of it, for, *per se*, the order of demolition was not to affect the value, but he was not to throw out of consideration what were the circumstances which led to the order. A more difficult mental feat could hardly be imagined. The fact was that if sanitary conditions were a standard, the houses were worth no more than would be given for them by a dealer in materials. A fortnight ago the second investigation was held. As a result Mr. Rodwell awarded the owner of eight houses 468*l.*, or 58*l.* 10*s.* per house; the owner of sixteen houses 135*l.*, or 8*l.* 10*s.* per house; and the London and North-Western Railway Company 117*l.* for six houses. This may be taken as about nine years' purchase of the assumed net rental, taken on the average of seven years prior to condemnation. It must be considered as far too high a price for the ratepayers of Liverpool to give, but the Courts would allow at least 50 per cent. in addition, and if there should be an appeal it is possible a much increased amount will be awarded. Local sanitarians may well hesitate about improving a town when they discover how precious, when seen from a judicial standpoint, are structures which are not safe enough to shelter cattle.

On Wednesday Mr. James Orrock gave a lecture in Manchester on "English Art," in which he referred to the peculiar position of England in having no recognised school. He pointed out that the French had been our fairest judges, for Constable, and now Reynolds, Gainsborough, and Crome, occupied a very high place in their esteem. Presently they would discover that John Constable, the founder of the fashionable and costly Barbizon school, was only one of our many masters who could each found a school of his own. This no-school of England had the living and lasting foundation of many schools, reckoned by the number of its masters. Long might we have literally no school, no leaping and racing after the bell wether. The beginning of a so-called school invariably meant masses of imitators who provided for the public the skim-milk of the art. Our art needed studying, not developing; it was full grown already, and had been so for a hundred years. Our little island was a quarry of fine art, out of which were shipped annually tons of masterpieces. There were more fine pictures sold in London than in all the world besides. We had produced the most exquisite embroideries and needlework which adorned some of the Catholic sanctuaries in Europe. Our mezzotint engravers had no rivals, and this applied to wood and line engravers also. We bought more foreign pictures than all the world, and the hall-mark of London must be secured for all works of great value. We had more fine Dutch and Flemish pictures than the nations put together, and we bought Rembrandts, Cuyps and Holbeins when their countrymen were starving them. If all this did not show us to be an artistic nation, what did it show? It was a remarkable coincidence that on the day when the lecture was delivered Mr. Agnew, among other gifts, had presented Turner's drawing of the *Salisbury Chapter-House* to the Wentworth Institute. Manchester alone probably contains as many paintings that were gifts as all the towns of France—if we omit those which were presented by the Rothschild family.

The provincial exhibitions in France are advantageous for artists. Out of one recently held in Rheims the sales of pictures amounted to 83,283 francs. The exhibitions are generally controlled by local amateurs, who endeavour to make them successful. Care is also taken to regulate the periodicity of the exhibitions by the wealth of the district. In Rheims only twelve exhibitions have been held since 1869, and as the sales amounted to 910,078 francs, the average has been 75,839 francs. It is evident also that this year's purchases exceed those of the past years, and it may be assumed that the next exhibition will be still more prosperous. Similar exhibitions, with guaranteed local support, are now being held in Nancy, Roubaix and Rouen, while next month one will be opened in Angers.

Mr. E. L. Hussey has enriched the Kentish collection in Lambeth Library with an important gift of prints and drawings of the late Mr. Hussey, architect. They represent churches and domestic buildings in the county of Kent. Several interesting details of Leeds Castle, Addington, and other houses are among the sketches, which will be of value to the student of Mediæval work. There are also many drawings of church furniture and antiquarian fragments, in all about two hundred examples. The Kentish collection is now becoming so representative as to require a printed catalogue, which is in preparation. Meanwhile, if unknown (as seems to be the case), these prints and drawings are readily accessible, with the other contents of the library, daily, on application to Mr. S. W. Kershaw, F.S.A. (except Saturday), from 10 A.M. to 4 P.M.

It is intended to open a museum in Alexandria mainly for the reception of objects of the Greco-Roman period. The director will be a Frenchman, M. Grebaut. A part of the contents of the museum at Ghizeh will be transferred to Alexandria, and in course of time it is expected that many things will be presented. It is understood that the museum and contents will be Government property, but donors will be able to stipulate if they desire that their presents are to be considered as the exclusive property of Alexandria. The Egyptian authorities profess to be unable to bestow much money on anything that relates to archæology. In order to uphold the museum, a charge of a shilling will be levied on visitors unless during one day in the week.

A new edition of "Rivington's Series of Notes on Building Construction" is in course of publication by Messrs. Longmans, Green & Co. The value of the work is evident when it is known that the present edition is the ninth of Part I. The alterations and additions consist in the transference of chapters on rivetting, centres, built-up beams and plate girders from Part II., the addition of eight plates taken from contract drawings, and a general revision. Part I. is now increased by eighty pages, and the number of cuts is nearly doubled. The addition of examination papers is also a boon for students. The "Notes" have been a treasury for compilers of similar books, and it would be difficult to estimate the limits of their utility. In their revised state they will be no less serviceable to students of architecture and building, for they are the best guides to construction.

THE BRITISH ARTISTS.

THE walls of the galleries of the Royal Society of British Artists are occupied this year by paintings and drawings that are more varied in quality than usual. It is in the galleries of the Society that many an able artist first gained a name, and everybody is disposed to make the best of the collection, in the belief that most of the works were produced by beginners. But this year much is seen which is not praiseworthy, unless we can admire the efforts of young people to appear as artists in spite of the privation of natural gifts and adequate training.

The one painting which cannot be passed without attention is *The Kingdoms of the Sun*, by Mr. Edwin Ellis. It requires a wider gallery and a higher position to be properly seen, but, with all drawbacks, it is most impressive as a representation of a moment when a change is impending among the clouds. The darkness which appears amidst the brightness is much bigger than the proverbial man's hand, and the rigid lines of the mass of vapour recall the towered citadel and pendent rock which Marc Antony beheld amongst black vesper's pageants. As a representation of aerial force of a kind that does not commonly appear in paintings, although no doubt it was observed, Mr. Ellis's work is successful. But is it for the sake of contrast that he paints so tame a sea for the bottom of his picture? Another startling work is *The Ferry*, by Mr. Cayley Robinson. In the boat we see a sort of Japanese shepherdess with a flock of goats, drifting by a bank on which tall lilies grow with almost mathematical precision. A picture of this kind is not seen every day, and if the elements seem incongruous, there is no doubt they are well painted. If there was more haziness in the lighting the attraction of the picture would no doubt be increased. In spite of its size and novelty the price of the picture is only 70*l.*, and, in fact, low prices prevail this year.

In the same room is an exceptionally large water-colour drawing by Mr. W. J. Morgan, *Old Cronies*, three men drinking, which is skilful in characterisation and quiet in colour. The settle, heavy chair and table aid in giving relief to the figures. Mr. Wyke Bayliss, the president, has two of his four architectural drawings in the room. The cathedral, Aix-la-Chapelle, is an exterior, a rather unusual subject with the artist, and, although somewhat cold, is suggestive of the building. The *Westminster Abbey* does not express the colour of the stone which is used in the interior of the Abbey, and Mr. Bayliss would find it advantageous if he turned during a year or two to Renaissance or other round-arched buildings, for he appears to be tending towards the conventional, or rather the stereotyped, in his later drawings, and is not sufficiently discriminative in treating Gothic buildings. Mr. Harding Smith has a drawing of San Zeno Maggiore, Verona, in which he does justice to one of the noblest examples of Italian Romanesque, and the treatment seems to be in keeping with the style. The view of Canterbury Cathedral from the garden near the baptistery denotes that the artist can be no less successful in representing Gothic work.

The single contribution of Mr. Sidley is called *The Miller's Daughter*, but many other titles would serve as well for the young lady who is represented. It is, however, very carefully finished in figure and background, and the style saves it from appearing to be a survival of the subjects in the ancient "Annuals." If Mr. A. E. Proctor's *Willow Walk* appeared as the work of a Frenchman, it would be praised for its softness and the tendency to blackness in the trees. There is no better manipulation in any of the landscapes of the gallery, and the general quietness is a creditable result. Mr. Kingsley's *Year's Decline* is almost as impressive as a work by Mr. North, whose colour and handling it recalls. Among Mr. Carlton Smith's pictures, the single figure of an Italian peasant girl, *Waiting*, is one of the most pleasing. The *Breaking Waves*, by Mr. Mottram, shows a timber groyne of a very dark brown against which a wave breaks into foam, with that excess of force which is necessary in a pictorial subject. Mr. Glendenning's *Heath and Bracken* was evidently produced by painstaking labour, but the general effect does not appear to have been considered, and hence it is too spotty. Mr. W. G. Foster's *Fisherman's Plot* is a picturesque bit of greenery. The four works by Mr. Yglesias in the room are satisfactory from the vigorous manner of grouping trees and flowers. Mr. H. H. Canty's *Rosebuds*, a girl and child in a garden, is smoothly painted, but graceful. Mr. J. Frazer must have been fortunate in finding a very bright day when painting his *Sheerness*, which appears to be an ideal watering-place. One of the best landscapes is Mr. Stuart Lloyd's *Harford on the Ouse*, in which the old church and the river are worthily depicted. He is also successful in Ely, where the cathedral is seen under a glowing light. Mr. J. L. Pickering, in his *Pine Wood*, has selected a moment when the trees become more sombre by a delicate light that glances on parts of the trunks. The *Doreholm*, by Mr. Frazer, shows a small island not unlike the Bass Rock surrounded by the sea. Mr. Birkenruth's *Amrai's Garden* represents a girl of a Bavarian type in white in a garden. This work is painted with skill and certainty of process. There is no other work by the artist in the room, and his limits are therefore unknown. Shakespearean subjects are out of fashion, and Mr. Eyre is to be commended for venturing on such a work as *Rosalind and Celia*. If the pair do not correspond with one's ideals, they are at least well drawn. Mr. W. H. Pike has a dramatic scene, *Too Late*, which at first sight suggests a highway robbery, especially as the figures in the foreground are of a criminal type, but it appears a duel has been fought, and a lady has not been in time, owing to using a lumbering coach, to prevent it. The picture is dramatic enough, and is painted so as to be seen at a long distance.

In the South-east Room there are some fine landscapes, *Tangiers*, by Mr. A. Mann; *When the Evening Sun is low*, by Mr. Proctor; *At Eventide*, by Mr. Watson; *In the New Forest*, by Mr. Holmes; and *A Berkshire Hayfield*, by Mr. Snell, being among them. Mr. Yeend King's *Girl Feeding Ducks* would be more successful if it were not for a spottiness that is unusual with the artist. Mr. Sheridan Knowles reveals great progress in his portraits, and his *Old Garden* shows skill of another sort. Mr. L. C. Henley is as careful as ever with his figures in the costume of the early part of the century. Mr. Hamilton Jackson has four excellent works, his *Spring has come*, an old Roman scene, being the most important.

Humour is rare of late in exhibitions. Mr. Strutt's *Family Broils*, a contest between cats and puppies, and Mr. Finn's *Is it genuine?* a scene in a broker's shop, where vendor and buyer are alike puzzled about the merits of a picture; Mr. Morley's *Eavesdropping* and *Poached Eggs* are all pleasant pictures, and are most welcome this year. Among works of different classes which merit notice are *Sunshine and Showers*, by Mr. Rouse; *Different Versions*, by Mr. Almond; *A Thames Mill*, by Mr. Proctor; *A Pastoral*, by Mr. F. H. A. Parker; *Curiosities*, by Mr. Lomax; *'Twas ever so*, by Mr. Bundy; and *Sundown*, by Mr. Dawson. If a good many of the pictures, which are not worthy of the galleries, could be removed, there would be more chance of justice being secured by the remainder. This year the search for signs of talent is not easy.

A SYDNEY HOSPITAL CASE.

WE have received a couple of blue-books from Sydney, N.S.W., which are evidence that two important building schemes have occupied the attention of the Parliamentary Standing Committee on Public Works. In both cases difficulties arose out of the evidence of the architects.

The first scheme related to a hospital in Macquarie Street, Sydney. Some years ago it was alleged that some of the walls of the old Sydney Hospital which stood in the street were affected with hospitalism, which interfered with surgical cases, and accordingly the front buildings were pulled down. The wings, being in a sound condition, were allowed to remain. It was arranged that front buildings should be erected out of a sum of 20,000*l.* which had been subscribed for a memorial to commemorate the escape of the Duke of Edinburgh from a murderous attack. The money was, however, used for the erection of the Prince Alfred Hospital.

After a time some money was obtained and more was promised towards the rebuilding of the front part of the Sydney Hospital. Designs were accordingly sought in a

competition, and it was stipulated that the outlay should not exceed 45,000*l.*, and every design was to be accompanied by a certificate from a builder to the effect that the design could be carried out for such a sum. The choice fell on a design by Mr. Thomas Rowe, who has had thirty years' experience as an architect in Sydney. Strange to say, there is no certainty about the builder's certificate in his case. Mr. Rowe believes that one was sent in, the secretary of the hospital is of the same opinion, but the document is not forthcoming. Mr. Rowe maintains that his building could not have been carried out for 45,000*l.* With slight brickwork and in an inferior manner the design might be realised for 50,000*l.*, but the architect says that to have completed the work in a substantial manner over 150,000*l.* would be needed. It was, however, stated by a builder before the Parliamentary Committee that a design by another of the competitors, Mr. Kirkpatrick, need not cost more than 45,000*l.* for its realisation.

Building committees have a habit of acting in a way that would not answer in ordinary business transactions. Instead of excluding Mr. Rowe's design on the score of not being in accordance with the conditions of cost, it was decided by the Hospital Committee to make it still more costly. Mr. Rowe was asked to prepare a new design in which some of the features in the premiated designs were to be included. One of the wings was also to be taken down and a new building erected in its place. It was also decided to use stone instead of brick for the walls, which in Sydney meant an additional cost of from 20 to 25 per cent. The number of beds was increased from 180 to 264. The Building Committee apparently considered they were possessed of an enchanter's wand, and could make buildings arise from the ground. What followed is thus described by the Parliamentary Committee:—

> The probable cost of the buildings designed in the first instance by Mr. Rowe he was, he states, never asked, and the probable cost of the enlarged design does not appear to have been known to the Board until after several contracts in connection with the erection of the new buildings had been carried out. The buildings were, in fact, commenced and raised to a certain height without the Board having any definite idea of the money that would ultimately have to be expended upon them, and it was not until 68,923*l.* 7*s.* 8*d.* had been spent and operations had come to a standstill, in consequence of the late Sir Alexander Stuart refusing the Hospital Board a further grant of money, that calculations to get at the cost of completing the buildings were made. It was then found that the amount required to complete the work was 140,000*l.*, making the total cost in round numbers 209,000*l.*

This agreeable information was duly conveyed to the Government in 1883, but what Financial Minister could deal with a case where the actual was nearly five times the anticipated cost? The works were suspended, and we believe they have not been as yet resumed. As is not uncommon when building enterprises fail, the wisdom shown in the utilization of the site of the old hospital was doubted, and the subject gave rise to much official correspondence. It was suggested that temporary wooden buildings should be erected, but the Government would have no substitutes. The affair was complicated by the circumstance that Mr. Rowe's plans had been approved by the Government, but it was understood that what was represented by them was a building that was to cost 45,000*l.* In fact, all the parties concerned in the case appear to have muddled it after well-established British precedents. There is no use in censuring them.

But while the confusion was becoming more confounded the poor in Sydney and the country around who needed a hospital must have suffered. An application was accordingly made in 1887 for authority to erect a building that would not cost more than 56,000*l.* in addition to the sum expended. It would have one storey less than was intended and 144 beds instead of 264. Sir Harry Parkes agreed to the proposal, but it was not until 1890 that his Government gained sufficient courage to ask Parliament to vote the money required. Subsequently it was decided to refer the subject to the consideration of the Parliamentary Standing Committee on Public Works.

It did not take long for the committee to make the discovery of being in a cleft stick. It seemed vain to inquire into the history of the misadventure, which seemed to have originated in the rivalry and jealousy of physicians. The new Prince Alfred Hospital made all concerned in the reconstruction of the old hospital eager to make it as fine as its younger rival. The architect said, "I knew what the work would cost, but I was never asked; and was it my duty to force my business upon the committee? The committee were vying with the Prince Alfred Hospital people, and the desire was to have a city hospital equal if not superior to the Prince Alfred Hospital. There was no desire to know the cost, I am sure of it. There is no letter in existence finding fault with me or my conduct in connection with this hospital building. The secretary cannot produce such a letter, and I have none. For five years I was never asked the cost of that building, and I have never received a letter complaining of its cost." That more expense was contemplated than was named in the conditions would appear to be inferred from the evidence of Mr. Horbury Hunt. He related how he objected to the smallness of the specified sum, and the reply was, "Mr. Hunt, do you suppose we are going to stick at 45,000*l.* for a building that we take a fancy to?"

The main question to be considered was whether the work already executed and on which nearly 69,000*l.* had been dispensed was to be entirely abandoned. The plans which had been carried out so far as that sum of money admitted were considered by their author as being perfect. The committee say:—"Twelve years have passed since the original plans were prepared, during which period the architect of the buildings, Mr. Rowe, has travelled in England and on the continent of Europe, where he visited many of the largest and most improved hospitals, and he states that he saw nothing to show that his plans for the buildings in Macquarie Street could be improved in any matter essential to hospital construction. But buildings after plans so perfect could not be erected for less than 140,000*l.* in addition to the 69,000*l* already expended. The amended plans for buildings of three storeys instead of four and accommodating 144 beds could not be carried out, as we have already mentioned for less than 56,000*l.*" The committee tried to discover some plan that would need a smaller sum, but the character of the work already done made one impossible. The walls are very thick; Pyrmont stone is used for the two storeys that have been built, and the use of brick for the rest of the walling would produce a hybrid structure that would not be suitable for so important a street as Macquarie Street. The Parliamentary Committee are therefore compelled to declare, "though the evidence shows forcibly that the plans have been prepared on a scale much more elaborate and expensive than is necessary, and that the expenditure already incurred, if not reckless, indicates a want of ordinary carefulness, the erection of the buildings having been carried to a certain point, the only manner in which any future expense may be saved is by reducing the height to which the buildings should be raised." The committee therefore recommended that the Sydney Hospital should be completed according to the modified plan at a cost of 56,000*l.*, an amendment to the effect that the outlay should be 80,000*l.* having been rejected. It was also recommended if any further revision should be necessary, the plans were to be submitted to the Government architect.

It must not be supposed, however, that all the evidence was in favour of that conclusion. Mr. O. H. Lewis, who is the senior architect in Sydney, recommended, in spite of all the money laid out, that the part of the buildings erected should be taken down and reconstructed on a different plan. Mr. Kirkpatrick, who was no doubt a competitor, and whose design was recommended for adoption by a sub-committee, said he was fully convinced that the hospital would not be a success, and recommended that the part commenced should be turned into a technological museum and art gallery, or, better still, as he said, "make the first loss a bad loss, and pull the building all down and clear it away." Mr. Dean, one of the directors of the hospital, who is a builder, said he considered the completion, according to the plans, could not be carried out for 80,000*l.*, or for less than 100,000*l.* It appears the 80,000*l.* has been arrived at without the aid of a specification. Mr. Horbury Hunt, although willing to have the hospital completed, admitted "that the design is defective and faulty, and not up to the requirements of present scientific knowledge." Dr. Bowker, when asked whether he recommended the completion or demolition of the hospital, replied, "My

notion is that it should be used for some other purpose if possible, or if it could not be utilised for any other purpose should be pulled down."

The case is one of those which make so many people lose confidence in architects, because it is supposed that clients' interests are sacrificed for the sake of the commission. The architect of the hospital was asked by one of the committee, "I want to know why you sent in plans of a building to cost 100,000*l.* when you were asked to prepare plans which would cost 45,000*l.* Why did you not tell the committee the cost?" The answer was, "If I had told them that I should simply have had to stand aside." And afterwards he said, "The committee were deceiving themselves. I did not think it proper to stand aside, so I competed under the conditions and sent in a builder's certificate, which I think was rather a humiliating thing to have to do, to the effect that the buildings could be put up in a certain way for the amount stipulated." There are many architects in England and elsewhere who will admire the diplomatic skill with which Mr. Rowe was able to dodge all those who were concerned in obtaining funds for the building. As far back as September 1879 the minute book records that "the architect stated that as soon as he has completed the plans to submit to Government he will be in a position to give an estimate of the cost of the building." And that position continued to be held without any estimate appearing, until the funds were exhausted. It may be a sign of ability to keep clients in the dark for a long period; but sooner or later there is a revelation and the architect must suffer. We regret to see from the evidence of Mr. Horbury Hunt, the president of the Institute of Architects of New South Wales, that the practice is becoming too general in that part of the world. When asked whether it was usual to send in plans which could not be carried out for the amount, he replied, "It is a disgraceful practice and becoming a common one." "Is it done," he was asked, "by a respectable class of architects?" and the answer was, "There is a certain class of men who, by persistent pushing, eventually get to be considered very clever men, and then there are some directors and members of the competitive committees who delight in this vicious system. I look upon the system as pitting one man against another to see who can tell the biggest lie on paper." In reply to the question, "How many architects are there in Sydney who would not lend themselves to this kind of thing?" Mr. Hunt said, "Perhaps half a dozen out of fifty are strictly non-competing architects."

To this depth has the practice of architecture fallen. Is it any wonder that, after hearing so much about modern practice, one member of the Parliamentary Committee should describe competitors as clever blacklegs, or that, as Mr. Hunt said, "The secretaries of these competitive committees treat our men as if we were pick-ups from the street?"

JAPANESE ARTISTS.

In a letter to the *Times* Mr. Ernest Hart writes as follows:—I spent lately many deeply-interesting weeks in the society of the artists, art-workmen and art-patrons of Japan in Tokio, Kioto, Osaka, Nikko and Nara. I rejoiced in your tribute to the memory of Shibata Zeshin, a great artist, as you say, in lac and in water-colour painting. Of his works I frequently received specimens, which are now in my collection, some of which I shall be happy to hand over to South Kensington. They are almost equal to those of his great predecessor, Ritsuo. Shibata Zeshin died in the darkness of a blind old age and in straitened circumstances. Allow me a little space to explain how largely Europe must share the responsibility of this state of things with his own countrymen.

Zeshin was one of the last of the "old school" of Japanese artists, and suffered with them from the uprooting of the old order of things and the substitution of Western "civilisation" and commercialism. In old Japan the artist-workman was a feudal retainer. He ranked socially far above the merchant or trader, who was a heimin—that is to say, of the fifth class in society, and who could carry no sword nor receive any title of honour.

I have before me as I write pictures, sword-guards, illustrations and even "No" masks, signed with the honorary titles of "Hogen" (baronet) and "Kami" (prince). Two of the ceremonial masks in my collection are signed Kami No Wakasa (Prince of the province of Wakasa). The favourite and affectionate title by which Motonobu, the famous painter of kakemonos in the seventeenth century, is still known is Ko-Hogen, the baronet of olden time, the chief and most honoured therefore of baronets. Ritsuo was the favourite companion of the Daimio of Tsuguru, and I have before me a noble work, a great "tsuba" (sword-guard) in lacquer, which he presented to his prince as a memento of their frequent fencing bouts, and which the latter offered as a votive gift to the temple.

Nowhere in the world did artists, poets and art-workmen occupy a higher or more honoured position than in Japan until some forty years ago, when we forced upon them, in conjunction with the Americans, treaties of commerce by the aid of war-ships, bombarded their cities, and exacted heavy indemnities for every hostile manifestation of their aristocratic dislike to mercantilism. We finally succeeded in so impressing them with our superiority of arms, laws, science and power that feudalism went by the board, the feudal provincial chiefs were disarmed and expropriated, and Board Schools, the new police, a Germanised army and Anglicised ironclads superseded the old samurai (two-sworded men) and the feudal system.

Four millions of samurai were thrown out into the world to earn their living, some as farmers, some as shopkeepers, some as jenricksha men (jarvies). The artists and artist workmen shared their fate, and it went hard with the latter. In Japan there is no abstract art; it is wholly decorative, the art of Benvenuto Cellini, of Giotto, of the Raphael of the Vatican Loggie. Their occupation was gone; the Daimios were impoverished, and for the swords, the tsubas (sword-guards), the inros (medicine-boxes), the chaire (bowls used for the tea ceremony), the lacquer-boxes and despatch-boxes—favoured products of the ancient art—there was no longer any demand. Habits were changed, requirements altered, the local castle enclosures in which the artists lived, and the provincial courts at which their art was fostered, were swept away. They had to look to Europe and to the merchants. Here they came into contact with a new order of requirement. Mechanical reproductions of cheap objects made in vast numbers and sold to pattern became the chief demand of the European markets.

There are in Western countries some connoisseurs who will pay handsome prices for works of ancient Japanese art, but there are few people in this country who do not think that everything which is new in Japanese art should be exceedingly low-priced. The consequence is that, with certain exceptions, the older school of artists have languished and starved.

Some of the new men have adapted themselves to the new order of things—men such as Namakawa, of Kioto, his namesake of Tokio, and Honda, of Nagoyo—are producing splendid specimens of fine cloisonné enamels, but they even are handicapped by the facility with which common imitations of their work are multiplied for the English market, and find a far readier sale to the undiscriminating masses because they are cheaper. So also with the porcelain of Seyfou, of Kioto, Inouye and Takemoto, of Tokio, Makuza, of Yokohama and others.

There are still great art-workers in Japan, but little of their best work comes to this country—it is bought chiefly in Paris and in America, where high prices are willingly paid for fine work, even though it be modern Japanese.

So great is the craze for cheapness in modern Japanese art-work, and the willingness to pay much higher prices for reported "old" work, that I found a large number of the best art-workers employed in fabricating pieces to which the appearance of age was skilfully given. Of many thousands of so-called "old" Japanese works of art which passed under my notice at the shops of the dealers in the great towns, at least 90 per cent. were fabrications of this sort, made to meet the demands of the many thousands of globe-trotters who now annually travel through Japan with eyes that cannot discriminate, and all demanding "old curios" which are manufactured for them by the thousand. The only other great demand for art-wares (so-called) is for the wholesale dealers of Yokohama and Kobe, who supply the warehousemen of London and other great cities, and these demand chiefly objects which they can sell by the casefull and in "large lines" to the retail curio-shops, the linendrapers and the grocers.

Thus have a variety of causes, to which "European influence" is no stranger, done much to debase and travesty current Japanese art and rendered hard the lot of the old artist and art-worker.

But under the influence of the Emperor and his household, and with the assistance of such men as Viscount Kuki and Mr. Okakura, better days are being prepared. At Uyeno Park, in the great art schools and technical institute, the remnant of the old art-workers of Japan are being gathered together. The son and some of the best pupils of Zeshin are there; so is Natsuo, the last of the great metal-workers of old, a descendant of the Gotos, and one of the Miochins. They are working in the service of the Emperor and under his patronage. Some large commissions have been accepted, one lately for the production of an equestrian statue, intended as a present to the Emperor from one of his wealthiest subjects.

Amongst a people so permeated with the love of art and so devoted to the admiration of all its manifestations, neglect of its professors can only be a temporary and transient phenomenon incidental to a period of revolution. When Englishmen learn to understand and to admire what is really fine and mature in workmanship, material and method in modern Japanese art work, and to cease to look for it among the bargains of the cheap linendraper, we may begin to atone for what we have done to degrade and darken the lot of the art-worker of the far East. It would be very helpful, both to our own growth in knowledge and taste and to the restoration of art in Japan, if the collections of our national museums were more complete and typical of the best work of earlier and modern Japanese. At present they are very incomplete and misleading.

GREYFRIARS CHURCH, ABERDEEN.

AT the last meeting of the Aberdeen Ecclesiological Society the Rev. Mr. Cooper proposed—"That this Society, having regard to the great historical and ecclesiological interest of Greyfriars Church, Aberdeen, and the ease with which a worthy restoration of the building, either as a parish church or as a college chapel and graduation hall, could be effected, protests against the proposal to demolish or remove it; calls upon the people of Aberdeen and all interested in the ancient buildings and ecclesiastical art of our country, to assist in its preservation; and respectfully asks the University Court of the University of Aberdeen to receive a representation on the subject." Mr. Cooper pointed out that the Society uses its influence for the conservation of buildings of ecclesiastical interest or artistic value; and they should be as salt that had lost its savour were they to shrink from or neglect this duty. He was sure he spoke for them all when he disclaimed any wish to embarrass either the university authorities or the Town Council in the efforts they were making at great sacrifice for extension of university accommodation. The Society recognised fully the pressing need for enlarged accommodation, but they believed that ample room could be obtained without the destruction of Greyfriars Church, and they should regret its demolition as at once a barbarism and a calamity. Mr. Cooper then proceeded to argue under various points in support of his resolution. First, Greyfriars was the most important of the very few fragments of Mediæval work which remained in New Aberdeen. Second, but Greyfriars Church was not merely a venerable relic. He begged to call special attention to the fact that it was an important "document" in the history of Scottish architecture. Students of the history of painting knew the historical as distinguished from the artistic value of "signed work" by an old master. Greyfriars Church was a "signed work" in architecture. They knew it was built "from its foundation" between 1518 and 1532. They knew the name of the architect who planned it—Alexander Galloway, parson of Kinkell—as well as of the munificent patron for whom he erected it—Bishop Gavin Dunbar. There were very few Gothic buildings in Scotland of which they could say the same. The difficulty of tracing chronologically the course of Scottish Mediæval architecture was very great, and it would be a terrible loss from a historical and scientific point of view if this "document" were erased or falsified. Third, it was of national design and workmanship. It was planned by a Scotsman—a north countryman—and built by Scotsmen. They could trace in the later work at Melrose and at Stirling the influence of the English Perpendicular; the influences of the French Flamboyant were not less evident at Linlithgow; while in regard to King's College Chapel, Aberdeen, their learned principal had justly drawn attention to the Flemish character of its details; but no contamination from any of these sources had affected the design of Greyfriars. Fourth, a further plea ought to have weight with the University Court. The architect—Alexander Galloway—was one of the chief of the early benefactors of the University of Aberdeen. Thrice over—in 1516, 1530 and 1549—he held the office of rector of the university. As rector he made the first recorded visitation of King's College. They would find the account of it at full length in the "Fasti." His donations, alike to chapel, hall and library were numerous and splendid. The very scarlet robe which the present Lord Rector wore was successor of one which he presented. In fact, to no one after the two great bishops—Elphinstone and Dunbar—did the university in its early stages owe so much as it did to the reverend architect of Greyfriars. The friars in their obituary notice were warm in the praise of their benefactor. Would the university so far forget him as to erase the last example of his work in Aberdeen, in order to erect in its place a modern structure of not half its artistic value? He would not attribute to them such ingratitude, but it was well to remember that gratitude was sometimes prudence, and that institutions which depended on benefactions ought to show that they did not forget their benefactors. Fifth, Mr. Cooper went on to say that, from a purely artistic point of view, the ancient parts of Greyfriars had high artistic value. Simple yet handsome, the design stood out in marked contrast to English buildings of the same period, which were generally overladen with ornaments at once uninteresting and needlessly repeated. On the other hand, it had none of the uncouthness which disappointed them in most contemporary Scottish work, for example, in the windows on the north side of King's College Chapel. He did not hesitate to say that Greyfriars was architecturally the finer work of the two. It was more symmetrical and more dignified. Nor did its regularity exclude invention. Nothing could be finer than the treatment of the great window in the south gable, where the basket tracery of the side windows reappeared, but so much modified that the seven lights seemed to group themselves into three divisions of three lights each—a fine suggestion of the Trinity in Unity. The window was probably unique in Scotland, and it had always been much admired by the discerning. He remembered, when he was a student, old John Ramsay told him it was the finest thing in Aberdeen, and now that the old houses in the Longacre which obscured it externally had been removed, it could be seen both inside and outside. After describing the frightful things that were done to the church in the last century, Mr. Cooper pointed out how Greyfriars could, with as much certainty as ease, be restored almost to its pristine beauty. He then spoke of its associations with the stirring times of the Covenant, and proceeded to ask why it was that a building of such merit and interest should be in imminent danger of destruction. Its beauties, after a woeful marring, had been buried, and the deformities, which were not part of the original building, alone exposed. That misfortune had left it without friends, save the comparatively few who took the trouble to look at its hidden and more worthy side, and had the knowledge to discern the capabilities it still possessed. The university was in clamant need of enlarged accommodation, and the site of Greyfriars Church, though not by any means the only ground that could be got, was the nearest and the handiest. Absurd, however, was it not, that the objection which chiefly ruled in the Town Council and decided them against those plans which showed the retention of the church, and in favour of an entirely new façade, was simply the idea that its grey old sandstone would not harmonise with the dazzling granite of the new building. On the same principle the West Church, the latest work of their great townsman, Gibbs, should be demolished next because it did not harmonise with the whiteness of the East Kirk and the spire. Surely an ancient seat of learning like Marischal College ought to have one ancient building to witness its three centuries' pedigree. He would add that, of the many needs of Marischal College, there was none more urgent than a chapel for the medical students. It was not right that so many young men, gathered there from all parts of the Empire, should have absolutely no provision made by those who for the time being were their guardians for their spiritual needs. Greyfriars would make a perfect college chapel. Nor could he believe that arrangements for its use for that purpose were impossible. Either as a college chapel or as the parish church of Greyfriars it should certainly remain. The proposal—which seemed to find much favour in unexpected quarters—to take the church down and reproduce some of its features in a new church, was open to many objections. It would deprive them of their antiquity with all its associations, and of their architectural "document." Even if there was an undertaking to remove Greyfriars stone by stone and re-erect it on a different site, they ought to reject it. The sad example of Trinity College, Edinburgh, ought to be enough. Some time ago a friend of his called on a Fifeshire minister, and was asked to come and see a Druidical circle. They went, and there were the stones beautifully arranged in a ring in a corner of the manse policies. "Dear me," said the visitor, "I had no idea you had an antiquity like this so near your manse." "Oh," was the reply, "it was not here. The circle was up on the hillside yonder, but I had the stones carried here for convenience sake." In conclusion, Mr. Cooper added a word in favour of the retention of Byron's house. Though not ecclesiologically in itself interesting, the memory of that great poet was a splendid association, worth infinitely more for those educational purposes a university was intended to promote than all the grandeurs which masons' hands were likely to create in Aberdeen.

Mr. Patrick Cooper, secretary, seconded the resolution, and in doing so mentioned that in a letter of apology for absence from Mr. Henderson, that gentleman wrote that he was strongly of the opinion that every possible effort should be used to prevent the fabric of Greyfriars Church from being interfered with, and that at all events, so long as he was a member of Presbytery, he would resist all proposals to demolish it.

It was stated by the Chairman that Mr. George Reid and Mr. N. Comper had written in a similar strain.

In the course of conversation which took place on the subject, the opinion was expressed that the public had not been hitherto aware of the destruction involved in the demolition of Greyfriars Church.

The motion was thereafter unanimously agreed to, and the president and secretary appointed a deputation to wait on and make a representation on the subject to the University Court.

TESSERÆ.

Reynolds as a Connoisseur.

THE best artists are not always the least fallible judges in their own art, of which Sir Joshua Reynolds was a remarkable instance. No unfledged peer or full-plumed loan-jobber was more liable to be deceived, even in those branches of the art which he professed most to admire—false Correggios, false Titians and false Michel Angelos swarming in his collection which he certainly believed to be true, for he was a man of correct moral feelings as well as elegant manners and enlarged understanding, and, so far from being capable of acting the dupe for the purpose of duping others, he both courted and practised the most open freedom of criticism on all occasions, and would no more have connived at the sale of a counterfeit picture than at the issuing of a counterfeit bank-note.

The Italian Style.

The Italian style may claim the preference over all others in virtue of its length of possession. A modern Gothic building, however unique a combination of elements it may boast, always looks like a reproduction of a Mediæval one ; while an Anglo-Italian example, though of as recent a date as the other, and without one original feature, has an air of genuine and entire modernness. Why is this? It is because the style of the former work, discontinued years ago, was only resumed within our own recollection, and because its original examples are amongst us to remind us of the gap between their date and that of the nineteenth-century representatives ; whereas the style of the latter, however it originated, was in operation centuries before our time, and its example of to-day is therefore, as it were, one of an apparently interminable series, coming down from the past and leading on to the future, to which it more significantly and eloquently appeals, and to which it has as much reference as to the past.

The Interior of St. Albans Abbey.

The shrine which contained the remains of the proto-martyr was emphatically the central point of all the manifold decorations with which the interior of St. Albans was once resplendent. Besides the painted decorations which covered pier and arch and wall and ceiling, there were a vast number of precious works of art connected with the numerous altars that were scattered all over the building. Of all these it is impossible now even for the most lively imagination, coupled with the soundest archæological knowledge, to form anything like a faithful picture, but we are not without some valuable records of some of the most important of them. Among these we have the shrine of St. Amphibalus, the Christian priest, who took refuge at the house of St. Alban. Mathew of Paris says that in 1186 the relics of this saint were transferred from the coffer in which they were first placed by Abbot Simon some fifteen years before, "into a new shrine prepared for this purpose, splendidly adorned with gold and silver of unrivalled workmanship . . . which wonderful shrine a certain middle partition divides interiorly, and in that part, whose front on the inside exhibits the passion of the saint, are reserved the relics of the martyr and of three of his companions; but in the remaining part the relics of his six other companions are reserved. In the coffer which before contained the said relics a small portion of the same remained, together with a considerable number of venerable bodies, and that coffer, with another like it, was placed in the presbytery upon the wall, at the right side of the high altar. In the second coffer are placed the dust found with the bones." Between 1195 and 1214, "by the industry of Master Raymond, the prior, and Brother Roger de Park, the cellarer, a great frontal was made (of which part is of metal and part of wood, most elaborately finished), which is before the high altar in our church ; also two texts of silver gilt, on one of which a crucifix and Mary and John are figured, and on the other the Majesty, with the four Evangelists, is engraven in elegant chasings by the mechanical skill and diligence of the monk Walter de Colchester, whose brother William painted a tabula for the front of the altar of the Blessed Virgin, with a super-altar carved, and a cross placed upon it; as also the frontals before the altars of St. John, St. Stephen, St. Amphibalus and St. Benedict." His brother and disciple, Master Simon the painter, wrought the frontals of St. Peter and St. Michael. The upper and lower frontals of the altar of St. Thomas were painted by Simon, assisted by his son, the monk Richard. To this family of artists, two of whom were monks, the monastery was indebted for the frontals of the altar of St. Benedict, and many other carvings and paintings. Another of Walter de Colchester's great works was the rood loft erected between 1214 and 1235. The chronicler says that this "incomparable painter and sculptor erected a loft in the middle of the church, with its great rood and Mary and John and other carvings and handsome decorations. Then the Abbot, William de Trumpington, solemnly translated the shrine containing the relics of St. Amphibalus and his companions from the place where it formerly stood, namely, near the high altar and shrine of St. Alban towards the north to a place in the middle of the church which is enclosed by an iron railing and grate, the altar which stood there being most handsomely constructed, and the frontal and super-frontal richly painted; and he caused the altar to be solemnly rededicated in honour of the Holy Cross and in honour of the saints whose relics were deposited near it, at the same time consecrating the great rood with its images, which stood over above this altar. The same abbot constructed certain framework round the high altar, on the top of which is represented the history of St. Alban, which most splendid work Master Walter de Colchester effected, not without very laborious study and diligent application, the Abbot generously bestowing ample means." To go back again to Abbot Simon, 1168–83, we find mention made of the "painted 'almery which is in the church against the tomb of Roger the Hermit," made expressly for the purpose of keeping the best books of the Scriptures, that any lover of the Scriptures might refer to them. As to images and figures, they must have been very plentiful in St. Albans. Mathew of Paris, artist friend of Walter de Colchester, who he seems never tired of praising, carved a most elegant image of the Blessed Virgin, the old image it replaced being preserved and set up over the altar of the Blessed Mary. At the same time the Abbot, it seems, carried out a number of other changes, including the removal of a certain beam from its place over the high altar to a place in the southern part of the church near the new image of the Virgin, on which beam he had figured the twelve patriarchs and the twelve apostles, and in the midst the Majesty with the church and synagogue.

Early London Conduits.

According to Stow, "The said river of Wells, the running water of Wallbrook, the bournes aforenamed and others the fresh waters that were in and about this City, being in process of time, by encroachment for buildings and otherwise, utterly decayed, and the number of citizens mightily increased, they were forced to seek sweet waters abroad, whereof some" springs, "at the request of King Henry III., in the twenty-first year of his reign, were, for the profit of the City and good of the whole realme thither repairing, granted to the citizens and their successors by one Gilbert de Sanford, with liberty to convey water from the towne of Teiborne by pipes of lead into their City." The Tybourne rivulet ran through Tothill Fields to Scholar's Pond, and thence into the Thames ; it is now a common sewer. The grant was made in 1236 ; the work was commenced in 1285 ; the waters from Tybourne were conveyed by a 6-inch leaden pipe to Charing Cross, and from thence to several conduits in the City, the first and greatest of which was erected at the Cross in Cheapside, at the end of Wood Street, in 1285, the distance being about 3½ miles, and for the first time water was conveyed by pipes into the City. In 1401 the prison-house called the "Tun, on Cornhill," was converted into a cistern for the Tybourne water, and was afterwards called the Conduit on Cornhill. In 1423 water was brought from Tybourne to Billingsgate, Paul's Wharf, and to a cistern in the wall of St. Giles's Church, Cripplegate. In 1430 the conduits reached the Standard in Cheapside, near Honey Lane. In 1432 water was conveyed to the gaols of Newgate and Ludgate, and in 1438 was brought from Tybourne to conduits in Fleet Street and Aldermanbury, and from Highbury to a conduit opposite Cripplegate Church. The abbot of Westminster granted the City in 1439 one head of water, containing about 800 square yards, or the sixth of an acre, together with all its springs in the manor of Paddington, provided the intended work did not draw the water from the ancient wells in the manor of Hida, showing by this proviso that four hundred years back it was discovered that any great draught from one well would be likely to leave the other neighbouring wells dry. This grant was confirmed by Henry VI. in 1441, and other advantages were granted by a writ of Privy Council to enable the citizens to bring water by means of leaden pipes under the ground for "above three miles" to a conduit in Cheapside, which was erected in place of the old one at the Cross, which Cross was also re-edified at the same time, and this conduit was used as a reservoir for the supply of other conduits. The water was conveyed from the springs to cisterns at Tybourne, from thence to Charing Cross and thence to the City. In 1443 a new conduit was erected near St. Paul's Gate, at the upper end of Cheapside. In the Old Bailey, a little lower than the Sessions House, was a large cistern with divers cocks, which received the waste water from the prison of Ludgate for the use of the neighbouring inhabitants. A fresh supply of water was brought by leaden pipes from Tybourne in 1471 to a conduit erected in Fleet Street, at the end of Shoe Lane, and to other conduits for the benefit of the people, viz. "for the poor to drink, the rich to dress their

meat." In 1478 a cistern was added to this conduit to hold the waste water, and another at Fleet Bridge. In 1491 a conduit was erected in Grasse (or Gracechurch) Street. In 1498 a conduit was erected at Oldbourne Cross, and was again new made in 1577 by William Lamb, citizen, who, having drawn together several springs of water into a head at the upper end of Red Lion Street, which was called Lamb's Conduit, conveyed the same to a conduit on Snow Hill by a leaden pipe 2,000 yards long. A stone conduit was erected in 1509 in the Stocks Market which stood at the north corner of Walbrook. About the year 1513 a conduit was erected in Bishopsgate Street, and in 1528 one was erected at London Wall. In 1535 water was brought from Hackney to a conduit erected in Aldgate. In 1543, notwithstanding the vast expense the citizens had been at in bringing water to, and erecting conduits in the City, the supply was very inefficient, and an Act was passed in the thirty-first of Henry VIII., empowering them to bring water from Hampstead Heath, St. Marylebone, Hackney and Muswell Hill, upon their compensating the owners of land for damage done by digging or otherwise. In 1546 water was conveyed in great abundance from divers springs lying between Hoxton and Islington to a handsome conduit erected at the west end of St. Margaret's Church, Lothbury. The Charterhouse was supplied from White Conduit Fields; Christ's Hospital from the Devil's Conduit, north-east of Brunswick Square. Stow mentions amongst the remarkables in the City of London a well at Aldgate curbed with a stone of great depth, and rising into a house two storeys from the ground, which is peculiar, "for I have not seen the like in all this City to be raised so high." There were other conduits of less note than those now enumerated and wells with buckets or pumps in Threadneedle Street, Leadenhall Street, &c. Sir John Evelyn writes that about the accession of Queen Elizabeth, in 1558, the waters of Dame-Annis-the-Clear Spring at Hoxton were carted to the breweries in London at an expense of 800*l.* per annum, and about the same time wells were dug and pumps erected in every corner of the City and suburbs.

Bronze Castings.

There is no section of industrial art, not even that of furniture, with its applications of carving, wherein the influence of fine art upon manufacture, and it may also be said the reciprocal influence of manufacture upon fine art, is more direct and perceptible than in works in bronze; indeed, the greater number of such works (those classed as *bronzes d'art*) are really works of fine art reproduced in large numbers for general sale, and coming under the name of manufactures only from this multitudinous reproduction. The skill that is required in the workman must approach that of the original artist, at least in technical execution, and in the power of fully comprehending the details of his form and the intention of his labours. It is to be recollected that in almost all cases the whole surface of the metal after it leaves the sand is submitted to the chisel of the chaser, and that even in the mode adopted by Barye to remedy this evil many joints have to be made, and their intersections and the numerous founts to be cleared away, leaving but small real difference in the skill required at the workman's hand, however much more of the artist's own treatment of surface may be thus retained. Thus it happens that in preparing these fine-art bronzes for sale, a large amount of intelligent finish is demanded, of which finish, in works of art manufacture as in works of art, there are various kinds and degrees. There is, for instance, first, the finish of the artist himself who originates the work, which, whatever the amount, is just so much as he considers conducive to its right and full expression. In the eyes of others this may or may not be sufficient, but who shall add to it judiciously, add to it, and not remove some of its individual characteristics. Many would think the works of Michel Angelo very unfinished, yet could a touch be given to them which would not injure their completeness, since every touch has been a thought, every mark of the chisel cut with understanding and judgment.

Unity of Style.

There must be some predominating influence, some prevailing sentiment present in the minds of men to produce a style. Did this influence really exist, it would be seen in all a man possessed, and unity of character in his house and all the furniture and chattels it contains would be the necessary result. In the Mediæval times this predominating sentiment was the respect of the many to religion; thus the aspect of all a man possessed was ecclesiastical, his furniture carved with emblems of the Church, and his walls covered with the choice precepts of religion. The principle of unity or congruity, however observable in the Mediæval period, was never attended to by the great artists of the Renaissance, and we continually see in their works and in their additions to other works, the strangest inconsistencies and anomalies. These revivalists, coming with all the ardent enthusiasm of converts from the study of Classic art, and convinced in their own minds of its ideal perfection and beauty, found the land covered with vast and magnificent temples and structures, deep in the love and reverence of what they deemed the vulgar public, and venerable from age and from consecration, yet of a style and character wholly opposed to that they sought to introduce. The reconstruction of these time-honoured edifices was hopeless, and the new race of architects began to seize upon and adorn the interiors of the old cathedrals and churches of Europe with rood-screens, stalls, altars, confessionals, pulpits and monuments, in the new style of the Renaissance, quite irrespective of the character of the original structure. In process of time they even ventured to make additions to the very structure itself. Thus, in our own country, Inigo Jones, not foreseeing the fiery purgation that was to prepare the way for the great monument of the new art, did not hesitate to build a Classic portico to the Gothic structure of Old St. Paul's; and it is impossible to enter the churches and cathedrals of France and Belgium and overlook how continuous was the endeavour to seduce the people gradually into the new faith in art, by additions such as those spoken of above. The apostles of the new faith did, in fact, but follow the practice and example of the early missionaries of Roman Christianity. These sought to humour the superstitions of the Pagan worshippers, and to wile them into truth by adopting, not only their festivals and holidays, but their temples and altars, consecrating them to the new faith, and at the same time smoothing down those distinctive differences that were most repugnant to their old belief.

Ornament and Material.

The homogeneity of grain in stone, and its perfect freedom under the tool, admirably adapt it for carving, but necessitate a different treatment to that for the continuous fibre of wood. The latter will bear more finesse of execution than the former, and a more detached relief; the colour, as light or dark, or veined and mottled, the hardness or softness, the intractability or freedom of the grain in wood, moreover, require peculiar renderings of the ornament; while metal, whether the ornament be cast, chased or embossed, evidently demands a totally different treatment to either. Again, the position of the ornament requires special consideration, as, for instance, its height above the ground, or point of view, which will govern both its relief and execution; much more varied quantities, bolder relief and coarser execution being not only allowable but absolutely necessary at great heights above the eye. The practice of cutting the ornament after the stone has been placed in the structure, so universal with the best Gothic carvers in Mediæval times, and still practised by the French workmen, admits of a right estimate of the true relief and just quantity of ornament; but from this very circumstance (its relation to situation) the mere reproduction of such ornament is often very unsatisfactory, for it must be remembered that the fitness of ornament for its special situation, and for the peculiar material in which it was to be wrought, was a necessity in its first production, but is overlooked in its mere imitative repetition. If then the translation of ornament, even from one position to another, requires that it should be greatly modified and changed, still more so is this the case when the material in which it is to be wrought is changed also. The heavy scrollwork of a Roman frieze carved in stone, although appropriate in its place far above the eye, must be quite unsuitable carved in wood as the back of a sideboard, and still more so cast in iron as part of a gate or a balcony, where it is not only close to the eye, but pierced through between the foliage, which in the original was backed out and supported by the ground from which it was carved.

Galleries and Museums.

Europe does not maintain sufficiently the distinction between a gallery and a museum of art. The latter, as in the Louvre, should contain everything good or bad which illustrates its history. The former should be confined to choice specimens of the best masters in their different styles and of all ages, so that the spectator should see nothing but what is excellent in subject and treatment. A few good pictures are far more effective than a myriad collected solely in reference to number. There are upwards of 1,000 in the Dresden Gallery. Two hundred culled from this mass would constitute a far more interesting and instructive gallery. The mind then would not be distracted and lose half its time in simply refuting, or, perhaps, misled by trash, overlook those of importance. It may be assumed that art would actually be benefited if one-half the gallery pictures were burnt; but as that would favour of vandalism, it would be better to put aside the inferior into museums open to those who wish to study the progress and spirit of art in different generations or masters, reserving for public eye only those that instruct or exalt popular taste. A few, also, have a better opportunity for being rightly placed, and therefore appreciated according to the intent of the artist, than when there are a great number. No gallery in Europe attracts more attention and gives more satisfaction than the Pitti, at Florence, yet in numbers it is one of the smallest. So of the Lichtenstein Gallery at Vienna, which never exhausts; but the body and mind weary over the interminable ranges of the Louvre.

NOTES AND COMMENTS.

A case of great importance to the building trade and others who make use of Belgian girders has been determined on appeal in the Edinburgh Courts. A firm of builders in Glasgow entered into a contract with Messrs. P. & W. Maclellan, the well-known iron merchants of that city, to supply beams and girders for new tenement buildings. One of the conditions was that the girders were to be delivered "at such times as may be required by the mason." There was some difference of opinion as to the meaning of the words, but when the case was first tried it was held that what was intended was that the rate of delivery was to be regulated by the needs of the masons, in order that the works might not be blocked up by the girders, which would be the case if all were supplied at one delivery by Messrs. Maclellan. The girders were obtained from Belgium; some arrived in good time, but owing to strikes and other causes the supply was retarded. Afterwards it became necessary to take an action for the recovery of the balance of 244*l.* due on the account, whereupon the builders took a counter action for damages on account of the delay. The sheriff who tried the case held that Messrs. Maclellan had proved that it was a custom in the trade that the buyer in such cases took the risk of delay from strikes and other unforeseen causes beyond the seller's control, and in both actions judgment was given in favour of Messrs. Maclellan with costs. The builders appealed. The judgment of the Courts below was affirmed on the ground that Messrs. Maclellan had exercised due care in placing the order for the iron with a proper and suitable manufacturer in Belgium; that they were not responsible for the delay which occurred, not having been able to anticipate its causes; that they were therefore not chargeable with breach of contract in unduly delaying delivery. It will be observed that in the judgment of their lordships the custom of the trade is not recognised, and that the issue was made to depend on the facts stated in evidence.

There are temptations enough around French artists to lead them into representing the nude in painting and sculpture, but an additional one henceforth awaits them. A couple of years ago M. Piot, a collector who was fascinated with the *putti* and *amorini* of the Italian masters, bequeathed a sum of money to the Académie des Beaux-Arts which was to be employed in founding a prize to reward the painter or sculptor who produced the best representation of a nude infant, whose age was not to be less than eight months or more than fifteen. It was arranged that the prizes were to be awarded after competitions. But it has been decided that the picture or statue which is considered worthy of the Piot prize is to be selected by members of the Académie in one of the annual exhibitions. It was supposed that the prize was intended for young artists, but for the future there is to be no restriction on account of age. Foreigners are also eligible for the prize. Visitors to the various Paris exhibitions may therefore expect to see naked babies on all the walls, and, like Charles Lamb, they must in consequence think kindly of "the much-calumniated King Herod."

The cities of Manchester, Liverpool, Glasgow and Dublin are often cited as examples which the County Council of London would do well to follow in dealing with the most important problem of water supply. Another case worth imitation is that of Leeds. Fifty years ago the town was supplied with water by a company. It was obtained from streams in the neighbourhood of Eccup and Alwoodley. In 1852 the company were empowered to take water from the river Wharfe, near Harewood Bridge, and it was about this time that the undertaking was transferred to the Corporation for the sum of 225,730*l.* Extensions of existing works were sanctioned from time to time, until, in 1867, it was felt that Leeds required both purer water and a larger supply. The Corporation were therefore, in that year, authorised to take water by gravitation from the river Washburn, a tributary of the river Wharfe, and the following magnificent reservoirs were constructed:—Lindley Wood, with an area of 117 acres and a holding capacity of 750,000,000 gallons, at a cost of 199,221*l.*; Swinsty, with 156 acres and a holding capacity of 960,000,000 gallons, at a cost of 162,707*l.*; and Fewston, with 156 acres and a holding capacity of 866,000,000 gallons, at a cost of 151,379*l.*, making in all a total area of 429 acres, 2,576 million gallons holding capacity, and a total cost of 513,307*l.* In 1877 the Eccup reservoir was enlarged, and it now has an area of 195 acres, with a capacity to hold 1,331 million gallons. Altogether the capital cost of the Leeds Waterworks represents a sum of 1,698,137*l.* On the other side of the account, it is found that when the waterworks were taken over by the Corporation, the gross income in 1853 was 14,172*l.*, the number of houses supplied being 25,000. The gross income on revenue account for the year 1891 was 101,744*l.*, the number of houses supplied 88,000, and the net profit for the year, after meeting expenses to the extent of 80,000*l.*, and setting aside 15,146*l.* for payment to sinking fund, was 6,588*l.*, as against 3,965*l.* in the previous year, or an increase of 2,623*l.*

The opening of the French Chambers is of late years sure to be marked by some resolution or report concerning the ruins on the Quai d'Orsay. As on former occasions, the duty of representing the ruins has fallen this year on M. Antonin Proust, whose name must be associated with them in the minds of all Parisians who undergo the pain of noticing parliamentary proceedings. He brought up a report recording the transactions of the past year, the abandonment of the sale of the ruins, and the reopening of negotiations with the Union des Arts Décoratifs. It would appear that history has been repeating itself, and that documents which were set aside several years ago could be utilised at the present time, the only alterations being a change of dates. After all that was said and done, nobody seems to be able to comprehend the present state of the affair. It appears to be agreed that the Union can possess the site and remains for a term of fifteen years, and can erect new buildings for the collections at an estimated cost of 3,171,000 frs., and that the Union will surrender its rights after the terms specified, when the property will belong to the French nation. But everything appears so clear there seems to be no obstacle to a commencement of the works, and yet it is impossible to say if they will be commenced. The whole history of the scheme is enveloped in mystery.

It will be remembered that a memorial was lately presented from some of the most influential trustees concerning the proposed extension of the Royal Manchester Infirmary. They said that, while of opinion that it was manifestly important the infirmary should be retained on its present site, any extension of the accommodation was undesirable. The Board of Management now say that they fully recognise the importance of not encroaching needlessly on the vacant ground belonging to them by enlarging the present infirmary. At the same time, when the fact is urgently pressed upon them by their medical advisers that fully to meet the increasing requirements of the hospital some additions on the present site are necessary, it becomes their duty, as the executive of the trustees, to submit to those trustees a plan for such increased accommodation as they deem requisite. On January 1 next the Board expect to receive from the selected architects plans for the additional accommodation proposed. Should the Board approve of any of the designs, they venture to hope the memorialists will give to such plans their impartial consideration when submitted to the judgment of the trustees, in fulfilment of the pledge given by the chairman at the annual meeting in July last.

That various trades are busy in Paris is plain from the increase in the *octroi* or duties which are levied at the boundary of the city. During the nine months of the present year there has been an increase in the duties of 2,493,028 francs over those received during the corresponding period of last year. Over one-fourth of the increase arises from building materials. Last year the duties amounted to 5,362,553 francs, while this year the duties on building materials already reach 6,111,502 francs, or 748,949 francs in excess of last year's receipts.



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EAGLE HOUSE, WIMBLEDON.—THE DINING ROOM.



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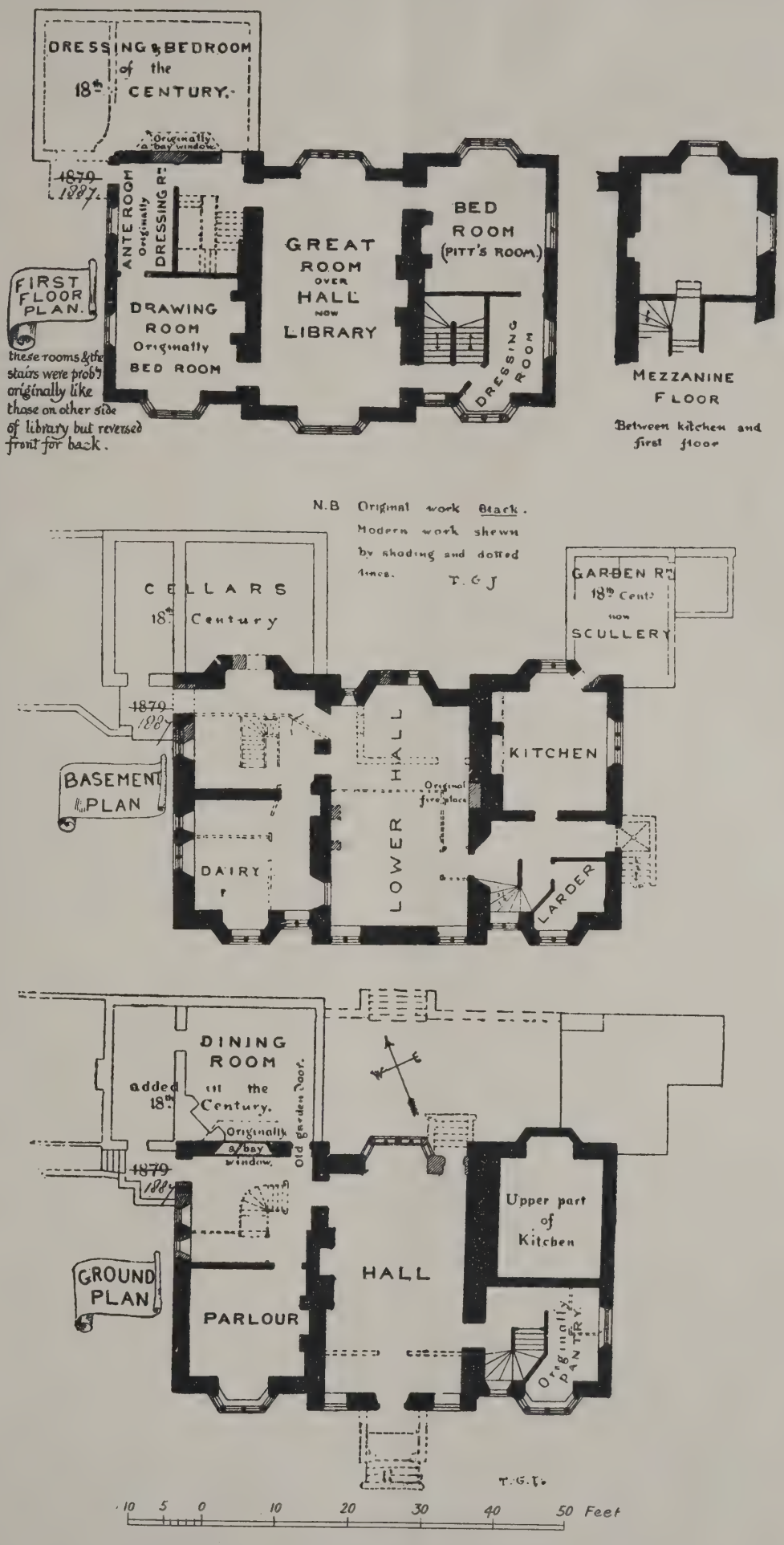


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ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NOS. 427–432.—EAGLE HOUSE, WIMBLEDON. [T. G. JACKSON.]

BRONZES AND ART CASTINGS.

A FEW weeks only have passed since Mr. George Wallis retired from the charge of the art collections in the South Kensington Museum. He was not destined to enjoy a long leisure, for his useful career came to an end on Saturday. Mr. Wallis was born in Wolverhampton in June 1811, and since 1841 he has been associated with the Governmental system of education in art. When he retired we referred to the reports which he prepared on some of the international exhibitions. As they are never likely to be reprinted the occasion is opportune to give some extracts from one on a special subject in which he was obliged to take much interest as head-master of the Birmingham School of Art. The report relates to Class 22 (bronzes, art castings, &c.) in the Paris Universal Exhibition of 1867. The parts now published are of permanent interest, and supply information that is not easily to be obtained :—

The metallic alloy called bronze varies slightly in its composition in various countries. In France, which is most undoubtedly the leading producer of this class of artistic and decorative works, the principal metals employed are "the copper of Chili, Russia, New Zealand and Minnesota, on Lake Superior, but the greater portion from Chili ; zinc from Silesia and the Vielle Montagne ; tin from Banca, Sumatra and Cornwall." M. Barbedienne, from whom this statement is quoted, also states that the zinc used in France for the purpose of casting figures, &c., to be afterwards wrought into imitations of bronze by the electro-deposit process and artificial colouring, is chiefly of the Vielle Montagne.

The conditions necessary for the development of this branch of industrial art appear to be a knowledge of the principles of artistic design and a love of art fairly spread through the people generally. The exceptional products exhibited by some countries, however excellent in themselves, are no evidence that the public sentiment existing in these countries at all approaches what we see at this day in France, and especially in Paris.

Partaking so largely of the highest artistic elements of design, the bronze manufacture may be considered a trade only by the extent to which it is or can be carried in the constant reproduction of the same subjects. Beyond its power of extension and the readiness with which the designs and models, together with the proper appliances for repetition, can be obtained in a properly-trained community, the manufacture of bronzes and high-class metal castings is in reality a fine art, and depends for its success upon its close approximation to, and continuous connection with, the art of sculpture in its best and most enduring forms. The marvellous reproductions of antique bronzes exhibited in the Italian section of the exhibition would go far to prove this, even if it were not patent to everyone that the education and training of the bronzist who is to be at all successful in his business must be essentially that of the artist, for however skilfully the model may be executed, or however perfect the casting produced from it, the fact that the finish must be that of the artist is self-evident.

The French bronzes may be broadly divided into two classes :—

1. Those which are designed and modelled as works of sculpture, and owe their interest and value to the higher qualities of fine art, in which statuesque severity of form, expression and dignity of treatment are combined to produce a given result in the material selected, without factitious aids from variation of colour, gilding or silvering, or combination with other materials.

2. Those which are essentially decorative in character, and which, whilst possessing many of the qualities of those named above, are yet so finished in detail and so varied in their effects of colour, gilding, silvering and enamelling as to make them ornamental and picturesque, rather than statuesque and severe.

Upon the capacity to produce works in the first class the power to achieve success in the second class must entirely depend. The art education of the bronzist in France is that of the sculptor, and the power thus cultivated is directed to the special manufacture or continuous repetition of designs. The growing demand has undoubtedly encouraged the development of this kind of art-skill until it has produced an important industry of great national importance, not only in this special direction, but also in the production of works in iron and zinc.

In 1844 I visited nearly every bronze foundry in Paris. It was easy to see that the skill manifested by the bronze casters and chasers would, at no very distant period, be directed to the manipulation of ornamental and decorative iron castings ; although at that period very little had been done in this direction, and the iron trade of France can scarcely be said to have had even an incipient existence. Personally, I regarded the position of the bronze manufacture at that period with a lively interest ; not so much in relation to itself as in its probable bearing upon the ornamental iron trade of England. In the present exhibition we see the very result which everyone would naturally expect after examining carefully into all the bearings of this question, in the exposition of ornamental iron castings in which the skill of the bronzist and the artist has been successfully combined with the best science of the ironfounder and trained metallurgist. Nor has the skill thus developed and carefully cultivated failed to react upon the practice of the bronzist. The efforts of the latter to overcome what, at first sight, appear insurmountable difficulties in casting art works in iron in one piece, from the fact that the system of "firing on" portions which in bronze can be cast separately cannot be applied to iron, has led to the adoption of a similar course of action in the casting of bronze figures and groups in one piece, thus eventually simplifying and cheapening the process. It is, therefore, perfectly in accordance with common sense and experience to assume that many important works in bronze of a complicated character produced on this occasion owe much of their success to the manipulative skill and experience gained by the moulder in the successful efforts to produce fine works in the inferior, or at least cheaper, metal, iron, from the fact that if produced at all they must be cast in one piece.

Fine Art Bronzes.

Taking the first-named class of bronzes into consideration, the principal works are represented by Victor Thiebaut. As works of fine art in bronze, Thiebaut's castings stand very high, and deserve careful examination. The most remarkable are a series of statues, life size, designed and modelled by several able sculptors, most of these being cast by Thiebaut. One is by De la Planche, a boy standing on the back of a tortoise with a bullrush poised above his head, as if using it as a whip. The spirit, expression and composition of this work are admirably adapted to the material in which it is produced. Another is entitled *The Winner of a Cock Fight*, a boy running with a pet cock held caressingly on one arm, modelled by A. Falguiere. *The Young Equilibrist*, as it is aptly named, is also an excellent work of the same class. It represents a boy spinning and balancing a plate on the point of a stick. This is designed and modelled by Blanchard. A boy with a tambourine, *The Saltarelle Dancer*, by Sanson, is another work of the same character ; whilst the bronze of *St. John the Baptist*, represented as a boy, preaching, designed and modelled by P. Dubois, differs from the works above quoted by its sternness, severity and ruggedness of character, not so much of treatment as expression.

All these works are excellent illustrations of artistic modelling and design, as adapted to this special material and mode of production. There is no trick in first making them apparently, if not really, difficult to mould and cast, and then overcoming these difficulties by methods skilfully provided for in the course of the modelling, thus frequently producing a constrained result in the arrangement of the group or pose of the figure. Everything has been kept simple in treatment, and there is a natural look about each figure which takes it out of the class of commonplace works in bronze or marble. No effort has been made to avoid "firing on" separate parts essential to the completion of the design, and when this is done it is with such consummate skill as to render it scarcely visible even to the trained eye accustomed to look at the right point for the usual evidence. This is especially the case with the advanced leg of *The Young Equilibrist*. The chasing and finishing of the surfaces at these points present examples of true art-skill—the power to conceal the method of the work rather than to display it. The manipulation is never overdone ; the touch of the original artist has been artistically, not mechanically, preserved throughout.

Decorative Bronzes.

The very remarkable and extensive collection of decorative bronzes and works in metal which may be comprehended in the second of the classes into which it has been thought advisable to divide the French bronzes for the purposes of this report, will now claim consideration.

As a matter of course, there is an incessant repetition of the same general characteristics. Novelties are attempted by one manufacturer, and repeated in varied forms by others. Thus it frequently happens that a decorative effect, which in itself is tasteful and successful, runs into positive extravagance and mere conceit by changes introduced as variations, which are not improvements.

There are two features in this class of metalwork which give a distinctive character to the collective exhibits, different from that of similar collections in previous exhibitions. One is the extent to which *cloisonné* enamelling has been introduced as a polychromatic and decorative adjunct, and the other is the use

of variegated marble, chiefly the onyx marble or alabaster of Algeria, in connection with metal.

The most remarkable enamelled works, both in size, elaboration of design, harmony of effect, perfection of execution and finish, are to be found in the collection exhibited by F. Barbedienne. In these objects a new development of decorative art in Europe is illustrated. Based on Oriental taste and modes of production, they rival the enamels of the East alike in design as in execution. In the best example, the vitreous colour is rich in tint, solid in the body, and becomes perfectly homogeneous with the metal base, so far as the two substances can combine in the formation of one surface. It would be quite useless to quote special objects here, inasmuch as to appreciate the real position of this phase of decorative art the whole should be carefully examined.

The bronzes, statues, statuettes, busts, &c., exhibited by Barbedienne are of the very highest class as decorative works. The more severe style, however, is avoided. Some of the finest works are in tinted bronze, and probably the best example of this class is a bust of Bianco Capello, a pendant to the Gorgone of the Duchess Castiglione-Colonna, purchased from the Royal Academy Exhibition 1866, for the South Kensington Museum. In its style the treatment of the metalwork is most successful. In the flesh it is large and grand; whilst the decorative character of the costume, which is arranged and rendered with great skill, gives ample scope for the variation of tint in silver, gold and black bronze. Nor does the work lose so much in dignity as might be expected from these variations of surface tint, owing, no doubt, to the thoroughly artistic character of the modelling, which no after treatment in the way of colour could well destroy.

M. Barbedienne has some specimens of casting in bronze, chiefly small busts, in which the amount of metal is reduced to a minimum by skilful casting. In these examples the "core" has been so carefully graduated from the full size of the model, and the fitting to the centre by the moulder so skilfully managed, that the metal is not very much thicker than stout paper or ordinary cardboard.

It may be remarked as worthy of attention by those whose business it may be to arrange works in bronze as the decorative adjuncts of the drawing-room or dining-room, that the French carefully consider the colour of the bronzes which are to form part of any given arrangement as a necessary element in the success of the *ensemble* to be produced. This may appear so obvious as not to be worth mentioning here; but however distinctly the fact may be seen and acknowledged, it is for the most part practically neglected in England.

A certain specialty of treatment has always characterised the amorini of the French bronzists. The works exhibited by Victor Paillard illustrate this in a most pleasing and satisfactory manner. There is a certain degree of conventionality about these works no doubt; in fact they are furniture bronzes of a very high class, and as such they are decorative rather than sculpturesque. It is not often, however, that the character of infancy is so thoroughly well treated. There is a full appreciation of the innocency of childhood in its happiest moods which is rarely to be found in far more ambitious works. As studies of treatment in metal, especially in this direction, M. Paillard's bronzes are excellent, for there are few things done so often by modellers for metalwork as amorini, and certainly there are few things in which so small an amount of real success is achieved.

One of the most useful and suggestive exhibits is that of J. Fel. It illustrates in a very effective manner the method of moulding and casting bronze groups in a complicated character in one "jet." The subject of the Laocoon, the three figures being cast in one mass of metal, is in itself an illustration worthy of careful examination and study. The others simply illustrate special points in the arrangements of the moulds and cores, but repay a prolonged inspection technically, although they have nothing specially inviting about their appearance, as all the "jets" are left upon them as they came from the sand of the casting-pit.

The extent to which the art industry of bronze ormolu has been carried in France, and the excellence of the gilding in brass and bronze by the use of mercury, have become traditional. The electro-deposit process of gilding, even when done with an extra quantity of the precious metal, produces a dull effect in comparison with the rich brilliancy of tint which results from the mercurial system. Unfortunately this process is a very unhealthy one for the workmen, and no one can be surprised that the Imperial Commission sanctioned the award of a "Grand Prix" to M. Henry Dufresne for his invention, by which it is stated gilding by mercury can be executed without danger to the health of those employed in the process.

Personally I cannot say that the examples shown by M. Dufresne appeared to me at all equal to the usual works in ormolu; but from his reputation as a damascene worker and metallurgist of great scientific and practical skill, there can be no doubt he satisfied the jury of the excellence of his system, and it is to be hoped that it will be adopted in England as readily as certain English processes have been adopted in France and with equal success.

Objects in ormolu form a portion of the display of most of the bronzists, whilst in many instances the exhibits consist entirely of works finished in this manner; but it must be confessed that the finest examples are those which have been executed by the more skilful bronzists as special proofs of their skill in this direction.

Amongst the very excellent decorative bronzes of Auguste Lemaire will be found some of the finest examples of ormolu. The "mat" of these works is especially noticeable for its richness of tint, whilst the judicious introduction of "burnish" gives greater value to it, since the latter does not, as is often the case in less artistic specimens, overpower the former.

M. Lemaire exhibits a pair of bronze statuettes of nymphs, designed and modelled by Carrier, also a bacchante crowning a bust of Pan. These works are executed in the artist's best manner, which is always artistically decorative, and, although approaching the conventional, is essentially original. The system of chasing adopted in the flesh portions of these works is very novel and effective, and deserves examination and study. It may, perhaps, be considered too near an attempt to imitate the pores of the skin; and when looked at very closely this objection holds good, but seen at a proper distance it imparts a charmingly soft surface to the bronze, making the flesh portions contrast well with the drapery, and yet the metallic character of the material is in no way interfered with. It may be "trick," but it is so skilfully and artistically done that one is not disposed to find fault with it, although in the hands of an unskilled chaser the effect would become vulgar and commonplace.

Zinc-bronze and Zinc.

The production of decorative objects in zinc has taken a very decided position in France. At first it seemed destined to be confined to architectural details of various kinds and to objects suitable to the flower garden and hothouse. The application of the electro-galvanic process, by which the surface could be covered by a deposition of metal and made to imitate bronze, and by which also it could be silvered and gilt, not to mention the more factitious methods of colouring the zinc surface to imitate bronze without incurring the cost of any metallic deposit, has led to the development of a very extensive manufacture in Paris. Practically this industry has arisen since the International Exhibition in Paris in 1855, on which occasion there were but comparatively few specimens of zinc, electro-coppered and bronzed, displayed.

In the present exhibition the aggregate display is a very extensive one, but it is simply a reflex of the style and art-power shown in the production of bronzes, occasionally running into decorative excesses in the way of gilding, variegated tintings, imitations of coloured enamel, &c. The works are chiefly reproductions of bronzes, cheapness being the main object. Little originality is attempted, and when such is the case it mostly runs into an extravagance which would not be tolerated in the true bronze. Occasionally the treatment is heavy, and more like that of carved work in stone or marble rather than of works modelled to be cast in metal.

It would be easy to dismiss these zinc-bronze works as "shams," and so far not worth further notice, but as they are honestly shown as imitations, and present features in which considerable art-skill is combined with much ingenuity in manufacture, they are so far worthy of examination as specimens of a distinct industry.

In the less complicated works a plaster-of-Paris mould will yield three or four, and sometimes more, castings in zinc, thus giving a great economical advantage over the casting of a bronze of the same character. As regards the comparative durability of works in zinc properly covered with a deposit of bronze or copper, it must be borne in mind that the zinc has such an affinity for the deposited metal as to practically unite itself with it more firmly and tenaciously than would be generally supposed. This is the best possible guarantee for the enduring character of the surface, which becomes as far as possible homogeneous with the metallic base constituting the cast.

As an illustration of the extent to which extravagance in colouring, enamelled effects, gilding, silvering and the admixture with other materials is carried in zinc-bronze objects, the exhibit of L. Hottot may be quoted. Here even flesh tints have been introduced, and imitation enamels in green, red, blue and black predominate over the bronzed surface of the zinc; and these things are made still more garish by imitation ormolu and silvered effects—a warning to all who desire to see true art-manufacture make that genuine progress which comes of art-skill directed by science and common sense.

As might be expected, the prices of these imitations vary considerably from those of similar objects in bronze. There is, however, no fixed proportion, as the prices vary from one-third to two-thirds less, and the average may be taken at about one-half.

There are a few exhibits, chiefly in Class 40, of works in

zinc, uncoloured and ungalvanised. The most remarkable example is that contributed by Grados. It consists of an architectural structure suitable for a gateway to a park or garden, and forms the entrance to the French galleries for the class in which it is placed. The columns and archivolt of the central opening and the architecture of the two sides are all of a decorative but decidedly architectural character. It is severe in its adherence to architectural precedents, and the workmanship is excellent; but, as the forms are those usually seen in stone, the lithic character of the treatment contradicts the metallic material in which the work is produced, and it is rather a lesson what to avoid than one suggestive of imitation.

Works in Cast-iron.

Allusion has been already made to the remarkable progress which the numerous contributions in cast-iron prove to have been made in France. This progress creates no surprise in those who have watched the development of the bronze industries, because it was inevitable that the art skill and power obtained over the various conditions necessary for making good castings in metal, although in the first instance applied to works in bronze and zinc, would of necessity be directed to the production of works in iron, when the gradual development of the French iron trade rendered such an application of skill to the cheaper material at all feasible. The result is now before us in the several contributions of leading French ironfounders. The quality of the iron is excellent as regards its surface and perfect finish as a casting material. It is said to be rather brittle, as is usual with charcoal-made iron.

Contrasting the very remarkable series of examples now exhibited with the few specimens of ornamental iron casting which were the subject of so much pride and congratulation in 1844, the change is a triumphant answer to those who so rashly declared at that period that whatever France might do in the production of art-bronzes, the casting of such works in iron or anything approaching to them would always be beyond the power of French artists or artisans to accomplish. Here, however, all is done which was so dogmatically pronounced as impossible, and very much more than even those who calculated what the art-power and manipulative skill and experience gained in the bronze-foundry would be likely to do, could have expected.

Although it is not proposed to discuss the question of ornamental or artistic iron casting at any great length, yet the successful application of the founder's art in this direction renders it desirable that certain salient points should be noticed. The practical ironfounder cannot look upon these specimens of his industry without receiving many invaluable hints from the skilful and thoroughly artistic manner in which these works have been treated by the moulder. The wonderful sharpness and beauty of the smaller specimens, the slight seams left on the surface from the perfectly even and correct fitting of moulds or "cores," the fact that very complicated examples are cast in one piece, and that this has not been done once or twice only and as a *tour de force*, but is the rule rather than the exception, all tend to prove that the skill of the French ironfounder has overcome most, if not the greatest, difficulties in the art of casting in metals, and especially in iron—a material of which twenty years ago he was traditionally supposed to know little or nothing, at least, industrially.

Prussia.

As might be expected, from the traditional skill of the workers of Berlin in cast metals, the bronze and iron castings of Prussia are of a high class in the best and most representative examples. The style of finish varies as much from the French as the nature of the objects selected and the treatment of the modeller. This treatment is invariably more statuesque and architectonic, without running into severity or stiffness. The chasing, too, in the best examples, is careful without being mechanical; rarely, if ever, running into the English mistake of over-finish, to the destruction of the spirit of the original model. In short, the Prussian chaser is as much an artist as the modeller, and probably, in most instances, is the same individual; at least, there is strong evidence of this fact in the best examples.

Bronzes.

As a specimen of refined casting and chasing in bronze, the reduced reproduction of the great monumental erection at Berlin to the glory of Prussia, the equestrian statue of Frederick the Great, executed by Rauch, in 1856, is the most perfect example of German taste and skill in this direction. Every portion of the detail of this noble national monument is carried out with a conscientiousness quite unique; no point has been neglected. From the most elaborate and important down to the minutest detail of the work, all is in harmony. As a lesson in the bronzist's art it could scarcely be surpassed. Happily too, there is no affectation of colouring or tinting in any way; and the metal being thus left in its integrity, tells its own story, so to speak, without any adventitious adjuncts or trickery.

Another remarkable specimen of art-bronze founding is a group, about one-fourth life-size, of a young mounted Greek killing a lion. This work is modelled by Albert Wolff and cast by Gladenbeck. It is of the same type of subject as the Amazon, by Kiss. The arrangement of the parts for the purpose of sustaining each other and yet preserving the utmost freedom of action, in horse, rider and lion, is very skilful. There is no sacrifice of art to the exigencies of production, but both are made distinctly subservient to each other, and both unite to produce a complete result. The horse rears on his hind legs, one foot being placed on the inside of the thigh of the fallen lion, the other resting on the base. The lion, wounded by a spear broken in his side, rises with his head, chest and fore legs, and is dashing, open-mouthed, at the fore-quarters of the horse, having already struck him with one of his claws. This claw and the fore leg is made to support the whole weight of metal in the mounted figure, the fore legs, head and fore-quarters of the horse. The rider is poised in his seat with a graceful and vigorous action, as he is about to strike the lion with another spear which he holds ready in his right hand. As a work of art, this bronze is very fine; but as a casting and as an example of the skilful arrangement of materials in perfect quantities, it is a lesson of no ordinary character.

Two large and important works are exhibited by Count Einsiedel, of Lauchhammer, together with a few small objects in bronze. These colossal statues of Frederick the Wise, of Saxony, and Philip, the Landgrave of Hesse, are thoroughly German in character. They are large in treatment; with an intelligent attention to costume. The finish is excellent as applied to works of colossal size. The artist has evidently studied, and with decided success, to render the moulding as easy as possible, the parts being kept in masses; yet nothing is sacrificed either in the way of truth of effect, dignity of pose or artistic arrangement, to the exigencies of making the cast practically in one piece.

Cast-Iron.

In addition to these colossal bronze statues, Count Einsiedel exhibits some very remarkable specimens of iron casting. A panelled iron door forms the centre of the group of which the two bronze statues are the lateral supporters. It is an elaborate and successful example of iron casting in the best manner. The design is admirably adapted to bring out the skill of the moulder and founder, and to show to what extent finish in this material can be carried in the casting pit or frame in skilful hands. The details of the ornamentation are very perfect, especially in the floral design in the panels. The figures are a little hard in effect, but this is a general characteristic of German castings of the draped figure.

Italy.

The Italian bronzes are chiefly reproductions either of full size or on a reduced scale of antique works. The skill shown in most of them is very great, in fact, perilously so for purchasers travelling in Italy. The fractures, patina, stains, dints and other damages incidental to disinterred objects of bronze art, are so skilfully reproduced, especially in the smaller and more portable examples, as to render some considerable insight into the "art and mystery" of the manufacture of old things from new materials indispensable before giving a judgment or making a purchase. One can therefore excuse the pertinacity with which an amateur who has seen an antique (?) bronze discovered in some classic spot, and dug up in his presence, adheres to his opinion that it is genuine in every particular.

It would be quite useless to note special examples of this integrity of reproduction, as nothing but a careful personal examination will be of the least value in forewarning collectors as to the only truth about the works—the truth of imitation.

In the larger reproductions there is less elaboration of the incidental details of forged antiques, but the skill of imitation is none the less evident on that account.

The peculiarity of the larger examples of the Italian bronzes above named is the remarkable absence of any appearance of an artificial system of colouring the metal. Of course, this is simply an appearance, as in reality they are most carefully treated; but then this is done with great skill, and is evidently not the result of any sudden or violent chemical action. In short, the object of the Italian mode of treatment is to give as nearly as may be the tone and tint which time gives, and not a special colouring as part of the artistic effect to be produced, which is essentially the French system, tint being an element of finish.

Conclusion.

In concluding this report I may be permitted to state that, as far as possible, every section of the class of objects included in the arrangement adopted by the French executive as belonging to Class 22, of which there are examples in the exhibition, has been examined and noticed, so far as I deemed them of practical value to the artist, the manufacturer or the artisan. The objects specifically described appeared to me to possess points of special interest likely to be valuable to those engaged

in the same or in kindred industries, or to present features which it seemed desirable to record among the achievements of art, science and manufacture in their relation to each other. In this respect the object I have sought to accomplish has been to make this report at once a lesson and a record—a lesson, so far as my knowledge and experience of art, as applied to manufacture, would enable me to apply the principles and practice accepted as the foundation of success in the great works of past ages and even of the present time, and a record of such novel features as appear likely to influence the future, whilst indicating the progress of the past twenty years by the facts derived from personal experience and observation, the result of opportunities of a somewhat exceptional character, but which rendered the task undertaken so much the more difficult to fulfil to my own satisfaction.

THE LATE GEORGE WALLIS.

MANY of the older art-students in Manchester and elsewhere, says the *Manchester Guardian*, will regret to hear of the death of Mr. George Wallis, F.S.A., late museum-keeper of the art-collections at South Kensington, and a former distinguished head-master of the Manchester School of Design. Mr. Wallis was born at Wolverhampton in 1811. At sixteen years of age he left Wolverhampton Grammar School with the determination of becoming an art-student. With this end in view he first visited Liverpool, but finding few facilities there for pursuing his studies he made his way in 1832 to Manchester. The art-world of Manchester at that period was exceedingly limited, its best men being William Bradley, Charles and Michael Calvert, James Parry, Arthur Perigal, John Ralston and Peter Williamson. George Jackson, with whom Wallis became afterwards so intimately associated in the work of the Manchester School of Design, was then following the humble occupation of a Roman cement ornament maker in Greengate, Salford. The facilities afforded too for art-study at the Royal Institution were of the most meagre character, as is evidenced in a passage in B. R. Haydon's journals of May and June 1837. "I find Manchester," writes Haydon, "in a dreadful condition as to art. No school of design. The young men drawing without instruction. A fine anatomical figure shut up in a box; the housekeeper obliged to hunt for the key. I'll give it to them before I go." Notwithstanding these drawbacks, the experience gained gave the keynote to Wallis's future career. "Thrown thus early in the very centre of a certain class of industrial design, and associating with patrons of art engaged in calico-printing, George Wallis," we are told, "became interested in an industry which appeared to him as singularly illustrative of the then essentials of modern decorative art, the perfection of science in machinery, a complete range of colour in chemistry, with the greatest possible freedom as regarded the art-conditions of design. The fact, however, that nearly all designs came from the Continent, and that Manchester paid 30,000*l.* per annum to Paris for such designs, which were frequently spoiled by the ignorance of elementary art in the 'sketch-maker' and 'putter on' in the technical adaptation of the pattern, appeared so preposterous that George Wallis naturally asked himself why these things were, and came to the conclusion that a more diffused knowledge of the art of design as applied to manufactures, based on sound elementary instruction in drawing, had become a national necessity. A visit to London in 1836 to see the exhibitions of the year opened a new field of observation and had a marked effect on his productions for the annual exhibition at Manchester, as it also helped to confirm him in his views of the national importance of artistic training." Wallis at this period worked hard as a landscape and historical painter and was an occasional exhibitor at the Royal Institution. He subsequently exhibited at the Royal Academy and British Institution, but never achieved any distinction as an artist. In 1837 he visited the Potteries in Staffordshire. Here he was as much struck with the poverty of artistic designs as he had been in Manchester, remarking that "a greater wilderness of ugliness it was impossible to conceive, and that with the exception of some good flower-painting at Daniels's (afterwards Minton's) there was nothing to show that Josiah Wedgwood had ever lived and laboured in that locality."

It was mainly owing to the persistent preaching and teaching of Haydon that Manchester saw its School of Design established in 1838. To the meeting held for establishing that school on February 19, 1838, Haydon was invited by the chairman, Mr. James Heywood. Other moving spirits in the establishment of the school were George Jackson (the first hon. secretary), James W. Fraser, Edmund Potter, Joshua Satterfield, Joseph Lockett, Salis and Louis Schwabe. Haydon, writing to his wife from Leeds on November 3, 1838, referring to the recently-formed school, remarks:—"At Manchester last week they told me that Chantrey, Wilkie and Shee had been there, and that Chantrey grumbled at the School of Design; but they told me that their influence was gone. The school is getting on pretty well. I am to make a report to the committee. It is infinitely better than it was, but on my second visit I had to find fault." What Haydon was doing for the advancement of art design in a general way Wallis was accomplishing in the various centres of industry with which he became identified. As we are told, "It is now generally conceded that about this date art as applied to industry and decoration had reached its lowest point. Haydon preached the study of pictorial art as a remedy, but the real question was a revival of art power in our artisans in its application to their everyday work. George Wallis saw this and worked in this direction." In 1837 he returned to his native town, Wolverhampton. In 1838 he delivered his first lecture in the Athenæum of that town on the "Cultivation of Popular Taste in the Fine Arts," and in 1839 another on "The Principles of Natural Form." Government now established a central school of design at Somerset House, under the direction of William Dyce. In 1841 Wallis joined the normal class for the future masters of schools of design, and carried off one of the six exhibitions offered by the Board of Trade. In January 1843 he was appointed head-master of the Spitalfields School of Design, London. This position he held with much distinction until the following December, when, on the resignation of its first master, John Zephaniah Bell, he was appointed master of the Manchester School of Design. The school, which had been in existence some six years prior to Wallis entering on his duties, had made fair progress, but it received a decided impetus from the new master. The school, originally founded, independent of Government aid, by a local council on a plan recommended by Haydon, subsequently adopted the scheme of Somerset House, which mainly led to Wallis's appointment. "His success here," we are told, "was unmistakable, whilst the course adopted at Somerset House—Mr. Dyce having retired as director and accepted the post of inspector of the provincial schools—had been the very reverse. This led to complications alike in London and the provinces, and a proposal was made to adopt a system said to be followed at Toulouse, for teaching the drawing of the human figure from flat examples. Mr. Wallis, having hitherto taught the figure through the cast and anatomy only, declared that the system proposed was much 'too loose' for him, and naturally declined to adopt it." At the reopening of the school under its new master (January 15, 1844) Wallis explained, in an address to the students, the new system of instruction intended to be pursued, and the discipline which would be enforced according to the regulations of the Central School at Somerset House. His various reports to the Council showed the rapid advances the school was taking, though he was not quite convinced that it was carrying out its mission as perfectly as it ought. In October 1845 he addressed an important "Letter to the Council of the Manchester School of Design on the System of Instruction pursued in that School," which was published and extensively circulated. In every way he endeavoured to carry out in the most practical manner his ideas of what a school of design should be in a great industrial centre like Manchester. He was constantly appealing to calico-printing firms requiring youths possessing a talent for art to communicate their wants to the school. Then he never missed an opportunity to address his students on any subject which bore the slightest relation to their studies. The last year (1845-46) he held his office he successfully organised an exhibition in the galleries of the Royal Institution, Mosley Street, of examples of art and industry combined. During the time this exhibition was open Wallis delivered a series of powerful lectures on "The History, Principles and Practice of Ornamental and Decorative Art"—lectures which attracted, considering the subject, very large audiences. In alluding to this exposition the *Art Union* (afterwards the *Art Journal*), in January 1846, remarks:—"This exhibition was opened to the public on Monday the 22nd (December 1845), and has excited great attention, not only from its novelty, but on account of its intrinsic merits. . . . We may here state that though in extent and variety the Manchester exposition cannot be compared with any of the great displays on the Continent, it nevertheless contains articles of great merit in textile fabrics, porcelain, the precious metals, electro-plated goods, carved wood, stamped leather, papier-maché, &c. The prize designs of the pupils of the school exhibit creditable proofs of progress; and though the printed patterns of mousselines, chintzes and furniture cottons are far from realising our notions of perfection, they are indisputably far in advance of the patterns which were prevalent in Lancashire a few years ago." So much importance was attached to the subject that the proprietors of the *Art Union* issued a special illustrated supplementary number entitled "Exposition of British Industrial Art in Manchester," which, as they remarked, formed "not only a guide and catalogue, but also a historic record which may afford important aid to those who may subsequently engage in the getting up of similar expositions." In his preliminary remarks the writer of the article pays a well-merited tribute of praise to Wallis as the originator and to Manchester as the pioneer of these industrial art expositions in England. One of Wallis's pupils at the school—one who took the second prize

in the prize competitions at this exhibition—was afterwards a distinguished member of the Manchester Academy of Arts and Royal Water-Colour Society—Mr. H. Clarence Whaite. Another distinguished pupil in the school under Wallis, and a first prize exhibitor of an original design, in one colour only, suitable for a muslin print, called *Cullings from Nature*, was Mr. Thomas Oldham Barlow, R.A., the famous engraver. Other pupils connected with this exposition were Mr. W. G. Gibbs, Mr. Robert Mudd, Mr. Edward Furniss and Mr. William Wallis. During his residence in Manchester, Mr. Wallis paid a visit to Paris to inspect the Quinquennial Exhibition of the National Art and Industry of France, held in 1844. "A careful inspection of the Communal *Ecoles des Dessein*," it is said, "confirmed Mr. Wallis in his views of the inapplicability of the French system of instruction to English wants, and of the importance of periodical displays of art industry, and side by side with his advocacy of art education for the people he urged the necessity for such exhibitions." How he raised the character of the School of Design in Manchester—seconded as he was, too, by the valuable co-operation of the then honorary but most energetic secretary, Mr. George Jackson—is exhibited in every passage of its progress. It was mainly owing to the line taken by Mr. Wallis and the Council of the school that Joseph Brotherton about this period introduced a Bill into Parliament "to enable Town Councils to establish museums of art in corporate towns." In the early part of 1846 Mr. Wallis resigned his position. His reasons for so doing are best explained by the Council in their report:—"The resignation of Mr. Wallis is the result of circumstances arising out of instructions as to the mode of tuition conveyed from the Government School at Somerset House, which Mr. Wallis, regarding as at variance with his own views, felt that he could not consistently adopt, and in consequence tendered his resignation. This resignation your Council, after the most careful consideration of all the circumstances, and with every desire to have retained Mr. Wallis as their head-master, felt themselves called upon (not without deep regret) to accept. With this expression of their feelings on the subject, your Council desire to add how much they are indebted to Mr. Wallis for the zeal, talent and unwearied industry evinced by him in the discharge of duties of no ordinary kind, the results of which have been manifested in the great progress made by the pupils under his able superintendence, and so fully evidenced by the specimens of their art at this moment in the course of exhibition on the walls of the Royal Institution."

Soon after Sir Henry Cole established his *Journal of Design* (in 1848), Mr. Wallis became one of its most valued contributors. His help was enlisted in organising the great embryo Exhibition of 1851. In connection with that historical undertaking, he acted as deputy commissioner for the eastern district of London, most of the counties in the North of England, and the whole of Ireland. Returning to London, he assisted in laying out the general space of the exhibition in Hyde Park; was superintendent of the British Textile Division and deputy commissioner for the textile group of juries. During his engagement with these arduous duties he was offered the head-mastership of the Birmingham School of Design. This offer he at first declined, but afterwards accepted. During his residence in Birmingham he was appointed a commissioner—with the first Lord Ellesmere, Sir Charles Lyell, Sir Joseph Whitworth, Sir C. Wentworth Dilke and Professor John Wilson as his colleagues — to visit the United States and examine and report on the state of art, manufactures, &c. Mr. Wallis's report on arts and manufactures and Sir Joseph Whitworth's report on machinery formed undoubtedly the two most important results of the commission. With the Paris Exhibition of 1855 he was intimately associated, being charged with the organisation of the British and colonial section. It was during this year that he may be said to have initiated the system of loans from South Kensington to local or provincial exhibitions, having induced Sir Henry Cole to send the first collection from the Museum to the School of Art Exhibition at Birmingham. Owing to various causes Mr. Wallis, early in 1858, resigned his position as head-master of the Birmingham School of Art and art superintendent of the Birmingham district. In 1863 he was appointed keeper of the art collections at South Kensington. This office, owing to advancing years, he resigned only a week or two ago. His last official connection with international exhibitions was at Paris in 1867, when he was superintendent of the British section in that part of the exhibition illustrative of the "History of Labour." His public appearances since that period have been mostly at annual meetings or distributions of prizes in schools of art, particularly of those with which he had been more or less personally associated. His last appearance in this capacity was in connection with his old school in Manchester in 1878, when he delivered an address to the students of the School of Art.

By his marriage—early in life—Mr. Wallis had a family of six children, four of whom survive. The eldest son, Mr. George Harry Wallis, who was for several years assistant to his father at South Kensington, is the director and curator of the borough of Nottingham Castle Museum and Art Gallery, where he has done some admirable work since his appointment in 1877. His youngest son, Mr. Whitworth Wallis, has won much distinction as the director of the Birmingham Corporation Museum and Art Gallery, whilst his youngest daughter, Miss Rosa Wallis, of South Kensington, is an artist of high repute, who has devoted herself to flower-painting in pure water-colours, and who has been for some years an important exhibitor at the Royal Academy, Royal Institute of Painters in Water-Colours, Society of British Artists, and at the Birmingham autumn exhibitions.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE second lecture of the session was given by Mr. Thomas Mair, tilelayer, his subject being "Fireplaces." The president, Mr. William J. Anderson, occupied the chair. Mr. Mair gave the experience acquired in many years' practice, and, while approving most of the model of fireplace his name is connected with, did not confine attention to it, but extended his notice to all other types commonly in use. The proportionate dimensions of fireplaces in relation to the apartments they heat, and the fuel required to give in winter 60 degrees temperature, he had tabulated. All iron he would prefer to see give place to tiles, as better radiators of heat. Flues in general, he thought, were built too small. Dog-grates, so admired for appearance, not infrequently prove troublesome. The ordinary causes were noted, and the remedial methods the lecturer adopted were described with the aid of diagrams. The customary vote of thanks was awarded at the close.

RESTORATION OF PILLATON HALL.

DURING the last three or four years, says the *Staffordshire Advertiser*, the old moated mansion of Pillaton, near Penkridge, the ancient seat of the Littleton family, has been in process of restoration, and the venerable pile now presents many features of interest, not only on account of its antiquity, but chiefly because of the fact that the restored portion of the mansion is, so far as can be traced, an exact counterpart of its appearance some three hundred years ago.

The remote antiquity of Pillaton Hall is sufficiently proved by early ecclesiastical records, which in the eleventh century describe it as a "capital mansion," the tenant of which for the time being was bound to lodge the abbot "honourably" whensoever he should travel in those parts and "desire to divert himself there." The history of the present building dates from the year 1480, when Richard Littleton built the chapel of stone (dedicated to St. Modwena) and the domestic buildings and offices of brick. Seven Sir Edward Littletons in succession inherited the family mansion at Pillaton, and the eighth, who succeeded in the year 1742, pulled down a large portion of the old house and built a new hall at Teddesley. During the partial destruction of Pillaton a large number of foreign coins were found concealed behind an old wainscot, of the aggregate value of some 16,000*l*.

For about a century Pillaton remained much as a writer in the *Gentleman's Magazine* described it in 1789. Except for some fragments of a wall, a few picturesque chimneys and a great oven, only the range of buildings which bounded the northern side of the quadrangle remains. This is the part which has recently been undergoing restoration. It consists of the chapel and gatehouse. The towered gateway is of three storeys, flanked by four corner turrets pierced with arrow-slits. On either side are two storeys of small rooms, those to the left as seen from the front facing the chapel. This venerable edifice, after centuries of disuse, was restored a few years since by the late and much-lamented Hon. William F. Littleton, C.M.G., and is now regularly used for divine service. It contains, among other interesting details, two lynchnoscopes, or "squints," narrow, oblong, slantwise slits through which the altar might be seen. A stone in the east wall is inscribed with a device of fifteen small triangles. The restoration of the chapel is very complete down to the minutest detail, and bears ample evidence of the labour of love which the work afforded to the late Mr. Littleton, who personally superintended it in every stage of its progress, and to whose intelligent research and cultivated taste the artistic completeness of the restoration is mainly due.

Within the last two years the restoration of the rooms adjacent to the chapel has been effectively carried out, mainly under the superintendence of the Hon. Henry Stuart Littleton, the original features being reproduced with great fidelity and minuteness of detail.

In the course of this later restoration a curious painted wooden figure was discovered in a hidden recess, the date of which is believed to be as remote as the thirteenth century, and

its history has given rise to much speculation among archæologists. A lady writer in a recent number of the *Antiquary*—Charlotte S. Burne—has given an ample and lucid description of this lay figure. It is, she tells us, 19 inches in height, and represents a man in a sitting posture, his hands on his knees, and his elbows raised and turned outwards. His face is turned to his own right, the mouth slightly open, showing his teeth, and his general countenance determined and threatening. His hair, which has been gilded, is cut short and straight across the forehead, but long at the sides, where it has a stiff horizontal curl. He has no beard, but there are evidences of incipient whiskers. He is clad in a long-sleeved collarless tunic, belted at the waist and reaching to the ankles. The cuffs, belt and bands are gilded. The right shoe is brown and the left green. A voluminous gold cloak, lined with blue, hangs from the shoulders and is arranged over the knees. A slender gold circlet on the head and large white gauntlets, with a red pattern on the back, complete the costume.

It was found in a recess behind the chimney in the first-floor room. The recess is 30 inches square and of the same height as the room. It was entirely plastered up in front, making the wall of the room level with the chimney-jamb, and was only accessible from above where there was a space among the rafters. It is just such a hiding-place as in many old houses—such as Boscobel for instance—is known as a "priests' hole," or hiding-place for the recusant clergy of the stormy times of the Great Rebellion.

The figure was exhibited at a meeting of the Society of Antiquaries some eighteen months ago, when its date was determined, and it was said to have a resemblance to the grotesque stone monarchs who till lately sat in the niches in the west front of Lichfield Cathedral. But what the figure really represents or how it came where it was found, are matters of conjecture, all the more puzzling when it is considered that it is to all appearance some two centuries older than the house in which it lay so long concealed.

ENGINEERING.

THE inaugural address to the members of the recently-formed Carlisle Architectural, Engineering and Surveying Association was delivered by Mr. W. Howard Smith, city surveyor, in the committee-room of the Town Hall. The chair was taken by Mr. H. Higginson, architect, and the three professions were well represented.

Mr. Howard Smith having first stated that the formation and aims of the Society had his full concurrence, he proceeded to remark that architecture, engineering and surveying were closely allied professions, and instanced his own experience as a proof of that. He was articled and spent the first few years of his life with an architect and building-surveyor in London, but finding engineering work more to his taste he, after having attended several courses of lectures at King's College, obtained an engagement upon the engineering staff of one of the principal English railways. He then turned his attention to gas and water-engineering, and after two years of this was engaged upon the working surveys and soundings for the Channel Tunnel. When the headings of that tunnel were stopped by Government he went abroad, and was employed upon the exploration for and construction of a railway in Brazil. When this was finished he returned to England, and was made Parliamentary Surveyor for 73 miles of a proposed railway in Yorkshire. He then went to Ireland and made a survey for what he believed was the first proposed light railway. Returning from Ireland, he became resident engineer in charge of the construction of some railways in the West Riding, being afterwards appointed deputy borough surveyor of Leeds, and coming thence to Carlisle. Mr. Smith next dealt with the general outline of municipal engineering in all its numerous branches, illustrating it by means of a diagram, similar to that prepared by the city engineer of Liverpool for the recent Congress of Hygiene and Demography. From a study of that, he said it would be apparent that it was almost an impossibility to be thoroughly master of the whole of the subjects in all their details, but there was no reason why an amount of knowledge should not be acquired of each such as would enable the municipal engineer to give reliable advice upon any of them. The use of such a Society as this was the imparting of knowledge and he gave a sketch of the workings of the Architectural, Society of Leeds, with its museum and sketching club, aided by the Yorkshire College, with the view of showing how much could be done in the way he had indicated. Then followed some pertinent observations upon competition and the professional training received by young men, Mr. Smith adding that in his experience young architects and civil engineers were not sufficiently practical. He thought it would be well if, after a young man had served his pupilage in an office, say for three years, during which time he should have acquired a fair knowledge of the theory of his profession, he were to spend a couple of years either in the workshops of a builder or of a mechanical engineer. Generally speaking, those in large towns had better opportunities of acquiring knowledge in these professions than those in smaller towns, but with the establishment of technical and art schools he thought these advantages would be to some extent more nearly equalised. In conclusion, he urged the members of the Society to remember that success could only be obtained by the reading of good papers, by harmonious working and by regular attendance at the meetings.

Bygones.

"Antiquity after a time has the grace of novelty."—Hazlitt.

HAYDON'S APPEAL.

IN 1820 Benjamin Haydon exhibited his *Christ's Entry into Jerusalem*, on which he had been engaged for six years, in the Egyptian Hall, Piccadilly. The experiment was novel, and it was not approved by all. A publicist of the day who was friendly to the artist, and pronounced the picture to be the finest historical picture ever produced in England, commented on the policy of exhibitions in the following words :—

"The plan of a public exhibition, at a shilling a head, is, we think, a bad one on the whole, though it would be clearly unjust to place the fault chiefly to the artist, as has been sufficiently explained in the preceding observations. Yet we cannot help suggesting that the painter who should occasionally employ himself on portrait, as a means of subsistence, and at the same time devote himself with ardour to history, as the means of fame, would (if the union be practicable, which perhaps it is not) take, in our view at least, a more dignified and pleasant mode of providing for his necessities. Public exhibitions (we mean exhibitions conducted by the artist himself) involve a number of things in their train which can have no salutary effect on an artist's character. Descriptive catalogues, advertisements and posting bills are dangerous stimulants, besides the temptation unduly to consider the popular taste in the selection of a subject, and to introduce accessories calculated to gratify popular prejudice in the mode of treating it. If we were once assured that an artist had fairly adopted this system, and meant to stick by it, we certainly should not lend ourselves to an abuse of terms by describing him as engaged in a gallant struggle for the triumph of high art and the elevation of the fame of his country. The utmost we could conscientiously say in that case would be that he had resolved on distinguishing himself, that he possessed great talents to effect this, and was not averse to supply all deficiencies, as well in them as in his opportunities, by a dexterity of management not exactly reconcilable to that dignity with which the public display of genius should always be invested. It is very possible, however, that in such an example we might see more to regret than blame ; we might acknowledge the influence of necessity rather than of personal disposition in the result, and deplore that a want of generous allowance and magnanimous encouragement at the outset had driven a noble ambition to avail itself of unworthy resources. We are carefully informed in his advertisement that his picture has been 'six years on the easel.' What is meant by this ? Does he mean to say that he cannot paint such a picture in less time than six years ? And if he has only been prevented by accidents from completing it sooner, what ground of boast is there in the delay, or what occasion for its announcement ? The public, we think, have nothing to do with the time employed in productions of talent to which their attention is called. Suppose we were to advertise 'a criticism on Mr. Haydon's picture which has been six hours on the author's writing-desk' ! The advertisement would be a silly one, that's all ; nor can we regard Mr. Haydon's as judicious. The fact is, that we see here the artist's eye turned towards the door of his exhibition-room. 'Six years on the easel' is something for those to repeat who could say nothing for themselves. It serves to raise the eyebrows of country cousins. It may be whispered round a female group, passed from a pretty girl's lips to her sweetheart's ear, stimulate the curiosity of papa, overcome mamma's economical scruples, and thus fix the tardy consent to pay a family visit to Bullock's the first fine day."

One of the changes produced since 1820 is in respect of similar exhibitions. Nowadays it would not be considered as derogatory to art if a painter hired the Egyptian Hall, but Haydon as a pioneer had to suffer from conservative criticism. He found compensation by the receipt of 1,700*l.* The price that Haydon placed upon the picture was 3,000 guineas. A committee was formed for the purpose of purchasing it, and presenting it to a church. The trustees were Sir George Beaumont (the amateur whose recipe about the "brown tree" in a

landscape will make him remembered) and Mr. G. Phillips, M.P. Among the subscribers were the Marquis of Stafford, the Marquis of Lansdowne, the Earl of Aberdeen, Lord Ashburnham, &c. It was afterwards exhibited in Edinburgh, and a writer in *Blackwood* described him as "greasy-pate Haydon," because the painter belonged to a set with Leigh Hunt and John Keats. Haydon was then in his thirty-fourth year, but he had gone through a more varied experience than many of his older contemporaries. He had discovered that, in spite of all his efforts, the public and purchasers of pictures were not disposed to accept him as the regenerator of art, and that aims, however exalted, were not a preservative against visits from sheriffs' officers. The truth, it is now seen, was that Haydon was better as a teacher than as a painter. His pupils went beyond him. Haydon was a skilled writer, as the following appeal which he made to the public "On the Relative Encouragement of Sculpture and of Painting in England" will testify :—

"There is nothing of which the nobility and the public of this country are so little aware as the expenses of a great historical picture. A sculptor, an architect, and a portrait-painter are allowed to estimate their expenses, to calculate their time, and to put upon these a reasonable profit, that they may live respectably and like honest men ; but the moment these things are done conscientiously by an historical painter, from the comparative ignorance that exists of the nature of his undertakings, and from the greatness of the sum required, an outcry is raised of the exorbitancy of his expectations and at the supposed unjustifiable nature of his pretensions.

"The other reasons for this are evident. For sculpture, for architecture and for portrait-painting there is a demand ; and the world must allow a man a fair profit on what is essential to its own pleasures or its own comforts ; but for historical painting there is no demand, and the purchase of such a production as an historical picture in England is considered a voluntary piece of charity on the part of the gentleman who purchases, and a voluntary piece of conceit on the part of him who has painted it, more gratifying to his own presumption than essential to his country : 'Quod super nos, sed nihil ad nos.'

"Nothing can be more essentially different than the modes of encouraging sculpture and painting with us. No sculptor begins a national work without an order ; he expects and he is paid half its price to meet the necessary expenses ; he makes a model in clay, which can be chiselled on the marble for eight or nine months by other hands than his own while he proceeds with other models, and finally goes over his work before he sends it home, and then receives five, six or seven thousand pounds for his production. The consequence of this rational and fair mode of patronage is that the sculptor works with tranquillity and ease ; he meets his expenses without anxiety by the advance of half his price, and, conscious of having his reward at the end of his labours, he completes his statue without impediment, because he is allowed to put a profit on his labour and his time.

Look you now what follows.—Hamlet.

If an historical painter wishes to paint a great picture, he begins it without employment, because it is not wanted, though everybody is convinced it ought to be done. He paints every touch with his own hand ; he meets his continual expenses in the best way he can, for his 'revenues' are like those of Horatio, 'naught but his own good spirits to feed and clothe him.' He sends it into the world finished by violent snatches of labour in the intervals of pecuniary want ; he takes years about it, if he wishes to do it well, and then, when he asks the price which will remunerate him fairly, he finds the sum so large that the nobility and the public, from knowing nothing of the circumstances connected with large pictures, accuse him of being either fond of money or of wishing to take advantage of the approbation they have given ; whereas he is actuated by a sincere desire to place himself above difficulty in putting a fair profit on his time and expenses, so that he may try for once what he can do when his mind is unshackled and free.

"I appeal to the country if this is a fair state of things. Is historical painting, or is it not, essential to the pleasure and the greatness of this country? If it be, ought historical painters to be left in such a state of uncertain reward?

"An historical painter is not like a poet ; he cannot put forth his effusions in the fields or in a small room ; he must have a large painting-room and a plaster-room ; he must have casts, books, prints, draperies, lay-figures, armour, hair and models of every description if he wishes, as he ought, to paint everything from nature.

"Again, in England time is so valuable to all, and all is so occupied, that no individual with either a fine head or a fine limb can sit to a painter unless he be amply remunerated for the loss of time occurring in consequence of his absence from his daily occupation. A guinea a-day, five shillings an hour and even a half-guinea I have constantly paid for good models, and good models are as essential to a painter as good brushes or good colours.

"These are facts of which the English nobility and people are not aware, for it is generally imagined a painter paints everything 'out of his own head,' as it is often expressed. This is done by many ; but Raphael, Titians, Correggio, Michel Angelo and Rubens had no such dependence upon unassisted powers, and if Englishmen look on these great men as fit examples, they must, in addition to the talents bestowed on them by nature, whatever they may be, bring to their aid the same artificial and natural means as were not disdained by their illustrious predecessors.

"An apology is now requisite for the intrusion about to follow of what relates more immediately to myself ; but as this letter is in part a defence of myself, I hope it will be, without hesitation, received by the public.

"Perhaps it may be affirmed with certainty that there exists at last a conviction in the public mind that great pictures, properly finished, are the only pictures in historical painting to do effectual good to the art. But unfortunately, from the reasons before mentioned, a sufficient knowledge does not exist of the great expenses attendant on painting them : if there had been this knowledge, 3,000 guineas would not have been thought, as it has been by some, too large a reward for my last picture, in addition to what I have received from the exhibition of it. With deference to those who have thought the price excessive I positively affirm it will not give me a fair profit on the expenses of the time and labour bestowed on it, setting aside the effects of ill health. Notwithstanding the liberal prices I have had for all my pictures, the expenses of them have not been always cleared. An historical painter at first ought not to expect more ; but the time comes when a man, in order that he may be honest to others, must be just to himself.

"From the conviction of the national value of large pictures, it has been my constant determination to devote myself exclusively to their completion, and to refuse, however lucrative, all small commissions. It has been my earnest endeavour to lose no opportunity that occurred to strengthen by writing the growing appetite for art, under the belief that short papers, with the knowledge of an artist compressed in them, were a likely method of rousing the attention and interesting the feelings of those who, from their occupations, might not have time to attend to more important works, however much they might wish it, on the subject of painting. But it may be answered the sincerest devotion to a pursuit is no proof of talents to honour it ; certainly not. The question then is, Have I or have I not, displayed talents to justify my pretensions? Is my pursuit worthy encouragement or is it not? Do I or do I not, deserve to be encouraged? The public must decide.

"This is no longer a question between individuals, but between historical painting as an art, and the public as patrons of it ; and no man ought under an affectation of modesty to ask a price for a large work that will do no more than clear his expenses, and leave him for another picture in the same state of want, anxiety, wretchedness and impediment, through which all historical painters have hitherto finished their productions in this country. If he does this from an apprehension of otherwise getting no reward at all, he becomes instrumental in setting a pernicious example for all future purchases, of cramping the efforts of all those who may come after him, and who, instead of being benefited by what he has gone through, would have the same hill to mount, the same obstructions to clear away, and be in danger of rolling to the bottom when their courage had brought things to the same crisis as I have brought things now.

"If the English nobility and the English public consider historical painting essential to the reputation of the country ; if they consider that I, as one of its members, have displayed sufficient talents to do it credit ; if they are convinced that the works which are now before them give sufficient pledge of my consistency and perseverance, and that I have displayed sufficient firmness in the pursuit, so that they may calculate on a continuance ; and if they think it of any importance that I should have the power of continuing in it, is it too much to expect that they will now decidedly step forward, and, by the public purchase of my last picture, according to the plan sanctioned by the first men in the country, set an example for the future encouragement of historical painters, and put me in an honourable condition to keep up the respectability of my private character, and to proceed in the execution of a more important work?

"On the other hand, if they think me a personal obtruder on their notice, who makes pretensions which he has no talents to justify, who overrates the value of historical painting to the character of the country, and pesters the public for encouragement at a time when thousands are in want in other pursuits more radically essential to the interests of the nation, it is but just that their public rewards in art should be reserved for those whom they may think more deserving, and whose conduct may excite in its progress less prejudices than mine."

It is well known that the course of events was not altered by the address, in spite of its ability. Haydon was again and again imprisoned for debt, and suffered much misery until June 26, 1846, when he uttered the prayer from "Lear" for the last time, "Stretch me no longer on the rack of this rough world."

RAILWAYS IN SIAM.

ACCORDING to a correspondent of the *Glasgow Herald*, a large London house is backing Mr. Murray Campbell, of Singapore, who has tendered for, and is likely to secure, the contract for the construction of the railway from Bangkok to Kerat, and thenec to the banks of the great Me-Khong, the river which flows from Western China through the Shan territory and Siam, and it is therefore probable that all the material will go from this country. A strong German syndicate tried to secure the contract, but the offer of the English firm at Singapore was 200,000*l.* less than that of the German syndicate, or at the rate of 6,500*l.* per mile. It is to be a single line, standard gauge, and will be commenced at once, so that it may be completed by 1896. The capital is 1,600,000*l.*, and the royal family of Siam have subscribed half of this, and the remainder, with the exception of a small portion, has been subscribed otherwise. The Government guarantee 5 per cent. interest for ten years after the railway is constructed. This is the first outcome of the appointment of the Royal Railway Department under the Minister of Public Works. The line for the present is only to extend to Kerat, which lies in a populous territory to the north-east of Bangkok, but its extension on to Nonghai, on the Me-Khong, is a matter of time. The route has been surveyed and plans made. This line differs materially from that surveyed by Sir A. Clarke, which was to pass up the western side of Siam parallel with the frontier line between Siam and Lower Burmah. The Siam Government have almost decided not to guarantee this line, but were the Indian Government to make a railway from Moulmein to the Myawaddi, on the frontier line, to connect with Sir A. Clarke's proposed railway, it might induce Siam to proceed with it. Sir A. Clarke's line also reaches the Me-Khong river, and, were it constructed, a British company would extend it across the British Shan States to the Western China frontier. This, it may be said, is the alternative scheme to that recently before the Glasgow Chamber of Commerce, by which a line was to pass from Mandalay to Kunlon, on the Salween river; but even the projectors of the Siam-Burmah-China railway agree that the Kunlon line would immensely benefit British trade with Burmah. Mr. Murray Campbell is the concessionaire or contractor for the railway across the Malay Peninsula, which brings Bangkok three days nearer Europe.

CORRESPONDENCE

Building Rights.

SIR,—Can you or any of your readers help me in the following matter? I own property in the main street; the building is set back from the street, say, 10 yards. Many years ago the frontage was occupied as a garden. At that time the owner of an adjoining property purchased the right to restrain the erection of any building higher than, say, 5 feet. For a consideration he has allowed the adjoining owner to build upon his front land, and he agreed to give me the same privilege, which agreement he, a lawyer, now refuses to carry out. What I desire to know is, are there any precedents to show that, when the character of the neighbourhood has entirely changed as in this case, I should be justified in fighting an action to sustain my right to erect a building similar to my neighbour?—Yours,

Rochdale. WILLIAM HAILWOOD.

NEW BUILDINGS.

Newcastle-on-Tyne.—The foundation-stone of the new Home for Incurables, which is being built by the Newcastle Corporation as trustees of the Hospital of St. Mary Magdalene, has been laid. The following is a brief description of the new buildings:—The new Home for Incurables will provide day-rooms and wards for 68 patients, with accommodation for the staff of officials and nurses on a complete scale, and is planned on a semi-pavilion system, so as to impart to it more the character of "home" than "hospital." The corridors and staircases throughout will be of fireproof construction. The new home will be erected of bricks and faced with pressed red bricks from Hogarth & Co., of Choppington, dark red Normanby quoins to windows, and Prudham stone dressings. Messrs. Middlemiss Brothers, contractors, are carrying out the work, under the superintendence of the architect, Mr. Edward Shewbrooks, Mr. David Reid acting as clerk of works. The contract price is 12,668*l.*, and the total cost, including furniture, will be 15,000*l.*

Wakefield.—The walls of the Bishop's Palace at Wakefield are rising fast. Circumstances prevented the formal laying of a corner-stone at the proper time, but on Saturday last a memorial-stone was laid inside the chapel, in the north wall, bearing this inscription:—"Ad majorem Dei gloriam sumptus harum ædium conferendos necnon lapidem quem videtis ponendum curavit boni cujuslibet operis adjutrix indefessa A. M. Boyd-Carpenter, Episc. Riponensis uxor, Die 24 Oct. A.D. 1891." A specially-designed trowel of delta, with silver mountings and incised silvered inscription, commemorating the occasion on the ebony handle, was presented to Mrs. Boyd-Carpenter by the architect. The building is of "purpose made" red bricks, thinner and longer than usual, with special mouldings, the windows having stone sills and brick mullions. The covering is to be of Welsh slate. The plan consists of a porch with ceiling groined in brick, beneath a low tower of four storeys leading into an outer hall, and large central hall with staircase and lantern open roof. Out of this hall are entered the drawing-room, chaplain's room, library and chapel, and a gallery round leads to the various bed and dressing-rooms. At the top of the front stairs is a lobby which leads to the examination-hall over the chapel. The chapel is of Domestic character, with flat ceiling. The dining-room is next the kitchen wing. Accommodation is provided also for twelve candidates for holy orders, with a separate chamber for each, approached by a small staircase leading from the hall. The architect is Mr. William White, F.S.A.

CHURCH BUILDING AND RESTORATION.

Camberwell.—The Church of the Sacred Heart, Camberwell New Road, has been reopened after enlargement. The enlargement consists of an addition of about 26 feet to the nave, a baptistery and organ-chamber, with a choir-gallery and music-room, &c., new porches and two towers with lofty turrets. The works have been in hand since April last, and have been much delayed by the strike of carpenters and joiners; even now the turrets are without their roofs, and chairs have to be used instead of the permanent seats. The architect is Mr. Frederick A. Walters, of 4 Great Queen Street. The builders are Messrs. Thomas Gregory & Co., of Clapham Junction, S.W., Mr. J. Newton being clerk of works.

Denton.—St. Mary's Church, just opened, has been erected from the designs of Mr. J. P. Pritchett, of Darlington, in the Early English style. It comprises nave, 38 feet by 18 feet; chancel, 22½ feet by 12 feet; vestry at west end, 15 feet by 6 feet; organ-chamber, 9 feet by 8 feet, with heating vault underneath; and south porch, 8 feet by 6 feet. The nave is of four bays and the chancel of three bays, each containing a lancet window with buttress between. The east end has a triplet lancet window, and the west end has a rose window, surmounted by a bell gable. Externally the walls are built of Houghton Bank stone, hammer-dressed, with chiselled dressings of the same. Internally the walls are lined with buff bricks from Normanby brickyard, with stone dressings to jambs and arches. The roofs are of pitch-pine, unvarnished; that of the nave being open to the ridge and covered with boarding; and those to the chancel and organ-chamber being waggon-headed with moulded ribs, and the whole are covered with brown tiles, from Ruabon in Wales, laid on felt. The lectern is the gift of Mr. John Proud, of Bishop Auckland, from a special design by Mr. H. D. Pritchett—as a memorial to the late Mr. John Marley, of Darlington. The whole has been carried out under the supervision of Mr. Pritchett, assisted by his son, Mr. H. D. Pritchett, by the following contractors:—Masons' work, Mr. T. Boyd, of Stapleton; tilers' work, Mr. J. Wandless; joiners' work, Mr. Franks (except lectern, which was made by Mr. Hobson); plumbers and glaziers' work, Mr. R. Smith; and painters' work, Mr. T. Metcalfe, all of Darlington.

GENERAL.

Lady Carnegie, of Crimonmogate, has announced her intention of giving to the Peterhead Public Library a series of fine plaster-casts, reproductions of ancient statues. They include *The Venus de Medici*, *The Fighting Gladiator*, *Hercules*, *Apollo*, *Ceres*, *Mercury*, *Antinous*, *Adonis*, *Diana* and others.

The Opening Conversazione in connection with the present session of the Paisley Art Institute has been held in the Museum Buildings. Mr. J. Caldwell, president, presided, and an address was given by Mr. Francis H. Newbery, Glasgow, on "Some Popular Errors about Art and Artists."

The Second Annual Exhibition of the Lanark Art Club has been opened by the president, Mr. Thomas Watson, jun. About one hundred works are exhibited by members.

Mr. Harold T. Burgess and Messrs. Spalding & Cross, London, have been appointed by the Coventry City Council as joint architects of the new baths.

Professor Baldwin Brown, M.A., of Edinburgh University, will give an address, entitled "Some Notes on the Growth of Cities," on the occasion of the opening of the session of the Dundee Institute of Architecture, Science and Art, on Wednesday, November 4.

Sir Douglas Galton has been invited by the Sindaco of Florence to investigate the sanitary condition of Florence and to suggest improvements.

The Architect.

THE WEEK.

The opening meeting of the Institute of Architects took place on Monday evening, under the auspices of the new president, Mr. MacVicar Anderson. The attention with which his address was listened to is evidence that the President, while previously discharging the duty of honorary secretary, threw himself thoroughly into his work, and from long experience knows what the Institute might accomplish for the profession, and, what is of equal importance, for the public at large. The position of affairs has been, however, to a certain extent defined, if not limited, by the course of recent events and by existing circumstances. So it was probably no easy matter to outline principles for future guidance of the members, and not hint that there were weak points to be amended. The President at the outset urged that attendance at the meetings should be more honoured in observance than, as hitherto, in the breach. It might have been added that, previously, the Institute owes something to the members of the Architectural Association for swelling attendance at meetings chiefly devoted to papers read by those versed in art, science and crafts indirectly connected with or subsidiary to architecture. The President alleged that he did not personally expect to be equal to others who might have occupied the chair, but he would hesitate at no sacrifice to do the best in his power for their interests. If attending the meetings involved sacrifice, he urged that some sacrifice should be made. Of late years the Institute, in casting about for a *raison d'être* to claim professional and public support, has among other matters elected to take a stand as an examining body, and recently the action of the Architectural Association has indirectly caused this to appear as a cardinal item on the Institute programme. It is needless to say that the President handled this topic ably, but it involved opening the question of finance. Here came the difficulty of avoiding an appeal *ad misericordiam*. Many members of the architectural profession, and a large majority of the public, fail to see respectively what particular advantages or benefits the Institute of Architects during its long existence has conferred on them. What the present President has already effected during his short tenure of office is far more likely to bring about increased membership, and consequently more funds to the treasury, than any expounding of benefits which so far mainly have only been attempted theoretically. One instance of tact, supplemented by business aptitude and technical experience, is seen in the conclusion of the prolonged and obstinate late trade dispute, where perhaps only too many of the ablest would have failed to bring about peace. The discussion in regard to the objectionable structure at Somerset House terminated in the agreement to notify in the proper directions that objection had been taken to the addition, which it was stated would be received with attention, and probably effect the desired object. Some ardent spirits thought that the resolution should be highly spiced with adjectives of a warlike and aggressive character, while others who were in their own opinion better informed than those who had got at the facts, advised memorialising in other directions according to their pet fancies. The President, in acknowledging the congratulations that greeted his address at the finish, alluded to their meeting for the first time with the electric light in the hall, and hoped it was a happy omen for the future. The numerous lights are so toned down that they produce something akin to the dim religious light of the sanctuary, so dear to certain persons who, it can hardly be said, listen to sermons they are supposed to be hearing; a soothing light that, aided by papers of an unexciting character, may have like results at future meetings.

The arrangements for the meetings of the Society of Arts during the ensuing session have been announced. The first meeting will be held on Wednesday, November 18, when the opening address will be delivered by the Attorney-General, chairman of the Council. On the following Wednesday evenings previous to Christmas papers will be read on "The Measurement of Lenses," by Professor Silvanus P. Thompson; on "The World's Fair at Chicago in 1893," by Mr. James Dredge; on "Secondary Batteries," by Mr. G. H. Robertson; and on "Spontaneous Ignition of Coal and its Prevention," by Professor Vivian Lewes. The first of a series of Cantor Lectures will be delivered by Mr. A. P. Laurie on "The Pigments and Vehicles of the Old Masters," and will consist of three lectures, commencing Monday evening, November 30. Among the following courses are lectures on "Electrical Distribution," by Professor Forbes; "The Uses of Petroleum in Prime Movers," by Professor W. Robinson; "Mine Surveying," by Mr. B. H. Brough; and "The Chemistry and Bacteriology of the Fermentation Industries," by Mr. Percy Frankland. A special course of lectures has also been arranged, under the Howard Bequest, on "The Development and Transmission of Power from Central Stations," by Professor W. Cawthorne Unwin, F.R.S., commencing shortly after Christmas.

The report of the Council of the Society of Architects records a satisfactory year's work. Thirty-one new members have been added, but as two members have died and nine have resigned, the net increase is twenty. At the first Council meeting of the session a policy of improving the organisation and extending the influence and giving stability to the Society was entered upon, and has been steadily persevered in. Local secretaries, who had previously been appointed in only two provincial centres, were nominated for all the principal cities and districts of the country and for several of the colonies. The question of the establishment of branches at two important colonial centres of the Society is receiving consideration of the Council. A series of conditions upon which such branches should be formed was drawn up by the Council, and submitted to a general meeting held in February, as was also a suggestion, made by one of the local secretaries, for the division of Great Britain into districts, each to have its own committee and secretary. At that meeting the principle of the formation of branches of the Society in the colonies was approved, and the detailed arrangements were referred in each case to the Council, subject to confirmation at an ordinary meeting; and approval was also given to the principle of the division of the country into districts, this matter, however, being referred back for further consideration and report. The pursuance of the same line of policy has, later in the session, led the Council to advise the Society to seek incorporation, and with this view they have caused both memorandum and articles of association to be very carefully drafted, the former setting forth more completely than has hitherto been attempted the objects for which the Society has been founded and reserving powers for their accomplishment, while the latter comprise the present rules of the Society, with many alterations and additions, such as experience and the growth of the Society show to be necessary. These were submitted to the members at the annual general meeting in June, and, with certain amendments, adopted, it being left to the Council for 1891-92 to carry out the reforms thus inaugurated. Arrangements have been made for obtaining a new lease of the premises now occupied at St. James's Hall. As in former years, private members have from time to time sought the advice of the Council upon difficult matters which have arisen in the carrying on of their practice, and such advice has always been given, after most careful consideration of all the points involved, by the Practice Committee and the Council.

The Gainsborough Local Board have had a return of courage, and while in that mood decided not to allow the arrangements for erecting market buildings and corn exchange to lapse, through fear of interference with the light and air of the owners of adjoining property. Recently a resolution was passed against the building. Since that time the Board have obtained advice from architects and surveyors which determined them to erect the buildings. If damage arises, which is doubtful, the amount of compensation that would be awarded need not scare the inhabitants.

HOSPITAL CONSTRUCTION.

IT is not often the arrangements of a public hospital are investigated by a Parliamentary Committee, and on account of the novelty, if for no other reason, some of the statements of the physicians before the inquiry concerning the Sydney Hospital are worth noticing. Last week we gave an account of the difficulties which arose through the entire absence of information about the cost of a new building, and which have caused the works to be suspended during several years. But there is a constructive interest as well as a financial one in the affair which is worth a brief consideration.

As we have already mentioned, the principal part of the old hospital was taken down because it was supposed that the walls, being affected by hospitalism, became a source of danger to the patients and interfered with the treatment of surgical cases. There seems to be little doubt that the danger was exaggerated. Dr. RENWICK, the president of the Board of Directors, said in his evidence that the popular outcry about the hospitalism was a mistake, that the difficulties of treatment were imaginary, and that if hospitalism existed, the removal of the plaster and the boarding would have been amply sufficient. But he denied that nowadays there were any grounds for apprehending danger from hospitalism. It was, he declared, "A thing of the past in every well regulated institution; for since the discovery of antiseptic methods of treatment, operations under circumstances which were formerly impossible are now carried out with the best possible results." Dr. RENWICK referred to Sir DOUGLAS GALTON as authorising the belief that "hospitals could now be built to almost any height without any danger of hospitalism, because of the perfectly preventative nature of the antiseptic treatment." On being asked by another doctor, who was a member of the Parliamentary Committee, whether there was not risk in crowding the sufferers from different diseases into the same building, Dr. RENWICK replied, "Not if they are properly separated; if the wards were kept free from each other, with an air-space between, there would be no danger." Finally he said he had not the slightest apprehension that disease took hold of a large hospital. Another witness who gave similar testimony was Mr. H. D. RUSSELL, who has been for fifteen years secretary of the Sydney Hospital. The following is an extract from his examination:—

You say you are in favour of large hospitals for the sake of economy, but do you think it is a good thing to have tier upon tier of patients?—Yes. Seven or eight years ago, the greatest authority on hospital construction, Captain Galton, met an audience who were interested in hospital construction, and he then told them that his ideas as to hospital construction had all been revolutionised since he had had a conversation with Professor Lister, who assured him that by the new system of surgery there was no danger whatever of hospitalism, that hospitalism was due to bad surgery—that was the old style of surgery—and that with the new style of surgery there should be no such thing as hospitalism, and that you could build tier upon tier of wards in a hospital with benefit to the patients rather than otherwise. Since then there has been no hospitalism in any hospital in England—that is, within the last seven or eight years.

Was not Lister an enthusiast about his own discovery?—Yes; and others followed him and adopted his views.

Admitting to the full the value of his antiseptic system, about which there can be no dispute, will there not be still exhalations from diseased patients, and is it wise to allow the atmosphere from the lower storeys to reach the upper storeys?—There should be no exhalations in a well-ordered surgical hospital.

Are not your staircases and lifts inside this building?—The lifts will be inside.

Are not the staircases inside?—But there is no communication from the wards to the lifts.

Not from side doors?—No.

Nor to the staircases?—No; the hospital is so constructed that there shall be no communication from one ward to another.

Do you think that no exhalations could pass from the lower to the upper ward even if blown out of the windows?—No; I do not believe there are such things. The hospital system of surgery is too cleanly to admit of that. In the old days it was very different. I can remember when the Sydney Hospital was stated to be hospitalised. In those days I have known surgeons to admit cases of erysipelas into the accident wards. I have known patients in the erysipelas hut to be nursed by the nurses of the accident ward. They used to go backwards and forwards from one place to the other. The utensils in the erysipelas huts were brought into the accident ward, and the consequence was that erysipelas was rife in the wards; but of late years nothing of that sort has been done, and there is no erysipelas now.

Do you think that that bad state of things was owing more to defective management than to the condition of the building itself?—It is owing to what is now called dirty surgery.

Do you think that if the front of the old hospital had been properly cleaned, and if it had been managed properly, it need not have been pulled down?—Yes; it was pulled down in error.

Through not knowing how to manage the hospital?—Yes.

Then ignorance has been the source of all the trouble about reconstructing this hospital?—It has had a great deal to do with it, I believe.

The liability to hospitalism, of course, may be said to determine the number of storeys in a hospital. Doctors, however, differ among themselves on that question as on many others which are of similar importance. Hence we find Dr. MACKELLAR, who was at one time medical adviser to the Government, saying that "all modern teaching on the subject would have us believe that hospitals should not be constructed more than two storeys high, and for purposes of administration it is clear that it would be more convenient to have two storeys only." The antiseptic treatment, which by some is supposed to make the highest hospitals innocuous, was not considered by Dr. MACKELLAR to be an infallible or an universal guarantee of safety. As he said, "The antiseptic system may be carried out in its entirety by those who have charge, or it may not—that would depend on the whims of the person who carried it out. I do not think that you could rely on that as a reason why the building should be more than two storeys high." Dr. BOWKER, who like most of the physicians that gave evidence is a member of the legislature, said it was ascertained by the great HUNTER that more people died under exactly similar circumstances in upper wards than in lower wards. It was stated that Miss NIGHTINGALE had approved of the plans for the lofty hospital in Sydney; but, according to Dr. BOWKER, that lady is distinctly of opinion that one-storey hospitals are more conducive than others to the recovery of patients. Dr. MILFORD, who has practised in Sydney since 1858, considered it to be important that there should not be more than two storeys in height. He admired the Tollet system now being used in France, of which he gave the following description:—

Pavilions of one storey, 25 feet high, supported upon a series of arches which are from 12 feet to 14 feet high. Then there is a wall composed of wrought-iron pillars at intervals of 5 feet, with brickwork in between. The roof finishes in a pointed Gothic arch, and is also made of brickwork, lined inside with plaster, and the plaster is painted. The flooring is of pine boards, and has concrete or cement underneath. The roof is covered with tiles and concrete, and comes up into an arch to allow a free current of air to pass upward, and thus proper ventilation is secured, which is advantageous to the patients. These hospitals can be cleansed either by flame—for they cannot be burnt—or by water. Then the corners of the rooms are rounded so as to have nothing to stop the free flow of air. The walls are hollow to allow of the passage of air up through them, and there are openings in them at intervals of 4 or 5 feet below and above, with valves attached so as to allow the air to enter only below and have exit above.

It was also remarkable to find that Dr. MILFORD was without any faith in the immunity of the old hospital from danger. He said it was "full of hospitalism, and cases of erysipelas and pyæmia originated constantly in the wards." Such contrary results of observation will not surprise anyone who has had a little experience of medical practice.

While so many physicians advocated the construction of hospitals not exceeding two storeys in height, it was, we suppose, only natural that the medical staff of the Sydney Hospital should appear in support of the design which originally represented three storeys above the ground floor. In a statement in support of the design which was presented to the committee it was said:—

With respect to the objection to the height (four storeys) of the pavilions, the staff would, in the first place, point out that the objection had very special weight in days in which the enormous advantages of lifts or elevators were unknown. Since the introduction of these appliances, with which all the pavilions of the hospital as planned are to be provided, more than half the force of this objection to buildings of the contemplated height has been removed, the conveyance of patients and stores from floor to floor being made an easier, and, in the case of patients, a less irksome matter than the travelling through very lengthy corridors. As far as economy of administration goes, the arrangement in four storeys has a decided advantage over any less height; as far as the transport of patients is concerned it has an advantage, and there remains only the purely sanitary aspect of the question. It must at once be granted that to crowd very lofty buildings on a restricted area would be an unwise course to pursue, since such an arrangement must interfere more or less with access of free light and moving air, two most important elements of health. It is, for instance, obvious that to surround a relatively small quadrangle with lofty buildings so as to create a pool of stagnant air and to interfere with the admittance of sunlight would be a serious error.

This would be especially true in a climate damp and comparatively sunless, and in a closely pent city site. But these objections do not in any wise apply to the plan of the Sydney Hospital, which has been so arranged that each pavilion is completely free and open on both sides, and they still less apply in a climate where, as in ours, the amount of sunlight during the year is so great.

It may be here pointed out that some of the largest and most important, and one at least of the newest London hospitals, have been built of at least this height without any ill consequences in a climate where the degree of sunlight is perhaps one-fourth of that which we enjoy. St. Thomas's, St. George's, St. Bartholomew's and the London are all of them of four, and, here and there, of five storeys.

It will be observed that nothing is said about the risk of the transmission of disease from floor to floor, but the representative of the medical staff in his evidence stated that he was without fear on the subject, especially as the openings for the lifts were entirely separate from the wards.

In considering the subject, the convenience of the medical staff of a hospital must be considered as well as the needs of patients. Questions of cost have also to be kept before the mind. There is no doubt that at one time patients in the upper storeys of a large hospital were not always certain to be regularly visited by the principal physicians, but since lifts have been introduced there are fewer obstacles to ascent, and the objection to several storeys on that account is less weighty. Besides, in large towns it is not always feasible to obtain sites which would allow of many two-storey pavilions, and the advocates of the system have to be content with a vertical rather than a horizontal disposition of wards. But in places where land is available there are many reasons for low buildings. The French sanitarians of late years have adopted them, and they are not wanting in science or in the skill of drawing sound conclusions from evidence. Even in Sydney there were few ready to speak against low pavilions. Dr. Maher expressed a common opinion when he said that four-storey hospitals were not disadvantageous if lifts were used, and that the rising of infection from ward to ward was more a theoretical than a practical objection, but, he added, "if you had space enough, it would be just as well to have all the patients on the ground floor."

THE INSTITUTE OF PAINTERS IN OIL COLOURS.

THE ninth exhibition of the Institute of Painters in Oil Colours is one of the most attractive that has been seen in the Piccadilly galleries. Among the six hundred and thirty works which are hung this year there are very few which are unsatisfactory, and the Council can be congratulated on having secured so excellent a collection. The landscapists have, however, continued to secure the larger share of the wall-space, but few visitors will regret the arrangement if it has caused the exclusion of portraits. There is no doubt that portraiture is one of the most important branches of painting, but of late years it has been overdone, and it is hard enough on the public to have to suffer the infliction of gazing at the likenesses of a horde of nobodies once a year at Burlington House. It will be generally admitted that the pleasure afforded by the exhibition in Piccadilly is in a great measure owing to the very limited number of portraits that are to be seen.

In the West Gallery the *Old Fishing Village in Sussex*, by Mr. C. J. Lewis, may be said to suggest the general character of the exhibition, that is, the predominance of landscapes which from their interest seem to be discoveries of unused scenes, and show, too, that England is not exhausted. Quietude seems to reign over the little village and the smooth water which no wave disturbs, and where the gulls alone are animated. But the agreeable horizontality of the place is disturbed by an unnecessary tree which is introduced for contrast. The purchaser of the picture will do well to insist on the tree being painted out. It is astonishing how many English artists continue to believe that painting the lily is not a wasteful excess. *Common Land*, by Mr. Clayton Adams, is a delightful little work, the clumps of bushes being finely contrasted. It is on the lowest line, where many of the best cabinet pictures are to be found. It is hard to say which part, the architecture or the figures, is better painted in Mr. Pike's *Canaletti and Tripolo*, in the Piazza, Venice. He shows the angle of the Ducal Palace, with the arcades and the adjoining Porte della Carta as a background to the brightly-dressed figures, among whom the two artists appear. The picture is one of the successes of the year. Mr. David Murray has a true, if dull, view of the *Rother at Pulborough*. The trained skill of Mr. F. A. Bridgman, the American artist, is seen in three pictures of Eastern scenes, which are good examples of his fidelity to nature and his admiration for light and shade. The *Fellahine and Child* and *New Shoes* will be found in the West Gallery. Mrs. Lea Merritt has painted the head and bust of a muscular but unbeautiful woman, and calls it *Atra Cura*. To justify the title, dark wings are introduced about the head and shoulders. The handling is powerful, and the whole style seems in keeping with the model. Mr. T. Pyne has a fine view of the *Ferry at Burpham*, with a distant view of Arundel, which John Constable considered to be one of the most wonderful parts of England. Mr. Fantin Latour's Flower Pieces always give delight, and there are two of them in the room. Mr. Yeend King's *Mill Pool* depends for interest on the green trees and deep grass that encompass the water, for figures are as absent as the mill itself. We are glad to say Mr. Kennington has this year forsaken miserable children, and his *Mischief* is more pleasant to look up, and is no less creditable to his talent. Mr. C. Earle has hit upon a good subject in his *Cider Mill*, for the red apples lying in the foreground and on the branches give colour that no old house or water-wheel could afford. Mr. White, in *Starting a Race*, shows a village scene with a man-of-war's man as handicapper, the prize being some fruit which he carries. The picture is of a kind that is popular in England. The *Rob Roy* of Mr. Lockhart Bogle is not so striking a barbarian as the Piper he exhibited at the Royal Academy, but there is the same red tartan and general reddishness. It is needless to say the figure does not correspond with Scott's reiver, for painters have not the courage to realise the description in the novel. At a distance the *Pythia* of the Hon. John Collier might, from the pose and subject, be taken to be a work by Sir F. Leighton; but on near examination it is found to lack the president's refinement and beauty of contour. It is better, however, than most of Mr. Collier's works, and shows a restraint he rarely exercises. Mr. East has only one landscape this year—a *Dewy Morning*, in which a hazy light envelopes trees and water. The elements are simple enough, but the style elevates them.

In the Central Gallery there are several attractive works that are mainly of cabinet size. Mr. Mouat Loudan, in *Five o'Clock at the Temple Gardens*, has painted a group of London children not without the aid of imagination. Mr. Heath Wilson depicts the massive unfinished Doric temple, with its unfluted columns, in his *Egesta*, and the ruin seems like a work of giants if compared with the representations of modern life and objects. Sir J. D. Linton presents a richly-clad girl as *Jessica*, but the face does not correspond with the ideal daughter of Shylock. *The White Rabbit* seems like an experiment in colouring of another style, for we see a darkened room like a kitchen, or out-house much neglected, in which a little girl sits dreamily and feeds a rabbit. The picture is finished with the utmost care, but so much labour might well be expended on a better subject. The West of Galway has been an inexhaustible field for Mr. Waterlow, and the *Summer Sea* and *Bloom of Spring* reveal the beauty of the region. It is strange that Irish artists are not to be found who are competent to paint such scenes in a manner that would satisfy the committee of an English exhibition. Mr. Watson Nicol takes up an old subject, a lover holding a skein of thread, and seated on a very low stool. Seventeenth-century is adopted for the pair. The *Goat Herd* of Mrs. Stokes is a child who knits while leading her charge along a mountain path. Very quiet colours are used, and in consequence the red kerchief around the girl's head becomes effective. The colours are laid on in a way which marks a practised hand. Mr. Frank Dadd's *Thirdly and Lastly* represents an old man in a parson's black gown going through a dialectic performance with a layman over a bottle. But from the expression on the face of the latter it might be supposed that he had been just informed that the logician was a highwayman in disguise, and sought after a pecuniary con-

clusion. Mr. ROBERT MORLEY happily sees the fun of some sorts of animal life, and his *Yoicks, Tally-ho!* a pair of young frogs pursuing a beetle, is worth a dozen hunting pictures. Mr. J. C. DOLLMAN'S *Malade Imaginaire*, a young lady in a bath-chair surrounded by admirers, is so terribly correct and new in the costumes that it would serve as the model for the show-plate of an enterprising tailor. The figures are characteristic of modern life in holiday times, and hereafter the work would be a historical record.

In the East Gallery Mr. COTMAN'S *Mill Stream* is one of the works that is sure of admiration. That artist prefers river scenes, but this is a new experiment. The point of view is from a hill, and we look down on the red-tiled roof of the mill, and the winding stream, which is crossed by a bridge in the middle distance. The water is perhaps of too light and hard a blue, but the whole scene is remarkable for its brightness and the power seen in the combination of the parts, as well as in the perspective. On the opposite wall is a painting which is no less successful, the *Breath of Autumn*, by Mr. PICKERING. The subject in this case, too, is simple, only a group of trees near a marshy pool, and a sky which is ominous with the lurid light that often portends a storm. But the parts are all treated with a vigour and knowledge that make the picture at once impressive. Mr. STOCK'S *Sleep and Twilight* is a nude figure gracefully disposed, and as well painted as can be expected in a country where such subjects are not encouraged. Mr. HARGITT suggests some of the rich colour which pervades the Isle of Wight in his *Niton*. Mr. AUMONIER, like several other artists, has gone to Sussex for a subject, and his *Hastings* shows a fine sketch of country with hills bounding it. It is among the works which uphold the supremacy of landscape in the exhibition.

GRANTS OF WATER.

THE number of the Journal of the Royal Society of Antiquaries of Ireland which is in course of distribution to the members is of varied interest. Among the communications is one on "The Water-supply of Ancient Dublin," by Mr. H. F. Berry, M.A., which goes back to A.D. 1244, when the Justiciary issued a warrant for an inquisition by twelve free men as to a source of supply for the city. Many of the extracts will be novel to hydraulic engineers. The following extract can be appreciated by readers who may not be acquainted with the topography of the Dublin district:—

According to a memorandum in the "Liber Albus," the prior and convent of the Holy Trinity, on the morrow of the Festival of St. Leonard the Confessor (November 6), 39 Henry III., are stated to have received water from the cistern of the citizens ("aquam de vase civium"), which is described as being situated opposite the Tholsel near the gate of the priory of the Holy Trinity. This supply would appear to have been furnished to the priory in pursuance of an agreement made between the city and the prior and convent, dated Thursday next after the Festival of St. Petronilla (October 30), 39 Henry III. The waterworks, in pursuance of the King's writ of 1244, should have been completed within the city walls about this period, and the very special memorandum above indicates that on November 6, 1254, the new supply of water was for the first time permitted to flow within the precincts of the splendid monastic foundation close by the conduit.

About the same time a grant "as perpetual alms" was made by the Mayor and citizens to the Church of the Holy Saviour near the Bridge of Dublin, and the friars preachers there, pursuant to which they were allowed portion of the city water, which was to be taken within the walls of the new gate near the house of William the Clerk, the friars attaching their pipe to that of the citizens at this point, and to have liberty to lay it through the land of the city as far as their house. In this instance (the monastery having occupied the site of the present Four Courts), it was necessary to bring the pipe across the river, and this the friars were to accomplish without injury to the bridge. The diameter of the friars' pipe was to be 5 inches, and within their house it was to be so narrowed that its opening might be stopped by the insertion of a man's little finger. The friars were to keep up the pipe at their own expense, and the Mayor and citizens agreed that should they be at any time molested in respect of the city conduit pipe, the Archbishop of Dublin, by stopping the pipe where it crossed through his lands, might restrain the citizens.

This grant is undated, but owing to the fact of its being witnessed by Luke, Archbishop of Dublin, who died in 1255, and by Richard de St. Martin, Dean of St. Patrick's, who held the Deanery from 1250 to 1260, there is every probability that it was made in 1254, and that the House of the Friars Preachers became indebted to the new water supply at the same period as the Priory of the Holy Trinity.

Robert de Assebourne, Mayor of Dublin, allowed the friars to lay the pipe of their conduit through his lands, which extended to Gormund's Gate by the wall, and the community was authorised to dig in his grounds and to mend the pipe when necessary. This grant is also undated, but de Assebourne was Mayor 1261–63.

A citizen named William le Devenys (who was Remembrancer of the Exchequer), was granted in 1290 a supply of water from the conduit through a pipe of the thickness of a goosequill, which was to be taken from the city pipe within the new gate, and to be brought at his cost to the stone house that belonged to William Picot. Shortly before this, in 1287–88, a right to some of the city water had been vested in Sir Richard of Exeter, knight, which was to be conveyed to his premises through a pipe of dimensions similar to that last mentioned, and a transfer of this right made by his son Richard to Henry le Mareschal (Mayor of Dublin in 1281) was confirmed by the Corporation, on account of "its usefulness to the vicinity." The confirmation stipulated for the water being taken from the city pipe towards the corner that extended to Kilholmok Street, and conveyed to Le Mareschal's house near Holy Trinity Church at his own cost, while a portion of the supply was permitted to be taken from his cistern for the use of the neighbours: the supply of this crystal stream would seem to have exercised a poetic influence on the grantors, as they imposed on Henry and his heirs the presentation to the Mayor and his successors on every Feast of St. John the Baptist of no less an offering than a "chaplet of roses."

In the person of one William, this same family of Le Mareschal had a demise of ground in the immediate neighbourhood of the reservoir already alluded to, the terms and local designations in which are of interest. In 1320 he was granted a plot between the wall of St. Thomas's Abbey and the curtilages of divers citizens in Thomas Street, which extended in length from the abbey gate as far as the city cistern of the watercourse towards the west, and thence as far as the place where the watercourse crossed; and in breadth, between the ground of Robert Rowe from the north and the ground of the canons of the said abbey from the south; and in length as far as the small cross that stood in the raised way towards Kilmainham, together with the fosse towards the north near the gate at the Barrs. Le Mareschal was allowed to conduct and discharge any overflow water through the fosse, and the service by which he held this grant was of a much more practical character than the ornamental one assigned his kinsman in the preceding one—he became bound to sustain efficiently at his own cost and labour the common city watercourse from the last place at which that water was turned aside towards the city as far as the city cistern near St. Thomas's Abbey.

In 1323 we find a rent of 6*d.* yearly charged to Walter de Istelep for a supply from the cistern near St. Michael's Church in the High Street, the water being brought in a pipe of the diameter of a goosequill through the middle of the street on the opposite side to Master Walter's house, and for 1*d.* rent in 1329, Nicholas Fastolf and Cecilia his wife were allowed a reasonable supply from Master Walter's cistern in the parish of St. Nicholas, the pipe to run through Rochelistreet, to their residence.

The Fastolf family were further permitted to have all their tenements in the same parish supplied with water through the pipe, and they had leave to open the street for the purpose of laying it and of repairing the conduit when necessary. The Corporation of Dublin, solicitous at that early period, as in these latter days, that the citizens should be put to as little inconvenience as possible by the opening of the streets, thoughtfully added a proviso that the work should be "speedily done," and that the Fastolfs should repair the street and sufficiently pave it at their own cost. The constant proviso in these grants as to the pipes being of the diameter of a goosequill will have been noticed, and it proves that in such cases the water was kept continually flowing, and there must have been tanks or vessels to receive it.

In 1458 the House of St. John without the new gate was granted the running water and its course from the small house called "le water-house," near Crokker's Barrs, passing through Thomas Street, and by the House of St. John the Baptist, so far as the water-mill of that hospital; the Mayor and commonalty, as of old, to be supervisors and governors of the water, and, in case of need, to have power to divert it to fill the city ditch.

By a Concordatum made by the Lord Deputy in Council on November 22, 1533, the rent was to be paid by the Vice-Treasurer out of the King's revenues to the Mayor, bailiffs and citizens of Dublin, in compensation for the rent of the watercourse, which had been paid by the Prior of St. John's until the dissolution of that house, when the watercourse became common.

Accustomed as we now are to a plentiful supply of water at

high pressure, and in cases of fire to the services of a skilled brigade, the primitive appliances and equipments provided against such emergencies by the civic authorities would seem wholly inadequate, and the chief of our City Fire Brigade might well be dismayed at the clumsy contrivances held in readiness for grappling with outbreaks of fire in the days of the Tudors. Twelve graps of iron for pulling down houses that might chance to be on fire and eleven buckets of leather for carrying water were ordered to be made, and the Mayor was bidden to see to the matter with all speed.

FOOTPATHS AND PUBLIC ROADS.

JUDGMENT has been given in the case Wilson *v.* St. Giles's Vestry, Camberwell, which raised an important question as to whether an ancient footpath and a new roadway can together be treated as forming a "new street" within the Metropolis Local Management Acts of 1855 and 1862.

Mr. Justice Charles, in giving the joint judgment of himself and Mr. Justice Cave, said :—In this case the appellant was summoned under section 105 of the Metropolis Management Act, 1855, before a metropolitan magistrate, to recover a proportion of certain paving expenses which had been incurred by the respondents in paving part of a road bounded on the east by a row of houses, three of which belonged to the appellant, and on the west by an open space called Camberwell Green. Whether the respondents could recover or not depended on the question whether this road was a "new street" within the meaning of the Metropolis Management Act, 1855 (18 and 19 Vict. c. 120, s. 105, and the Metropolis Management Amendment Act, 1862 (25 and 26 Vict. c. 102, s. 112). The road in question has on the west side the open green, and on the east there is a footpath which on January 1, 1856, when 18 and 19 Vict. c. 120 came into operation, was repairable by the inhabitants at large, and which has been from time to time since that date repaired at the ratepayers' expense by the respondents. The footpath was undoubtedly a "street" within the definition given in section 250 of the Act, and vested in and came under the management of the respondents under section 96. The roadway of the road has never been repaired by the respondents, nor had the management ever been assumed previously to the passing of the Act of 1862 by the authorities having control of pavements and highways in the metropolis. In 1873 the respondents tar-paved the footway, in pursuance of a vestry resolution, at a cost of 25*l.*, which was charged on the ratepayers generally. Tar-paving is not considered by the respondents to be "permanent" paving as distinguished from asphalte, and the magistrate found as a fact that it was in the nature of repairs of a temporary character. He also found that all other repairs which had been done were temporary only. On March 19, 1890, they passed a resolution whereby, after reciting that Camberwell Green Road was a "new street," as defined by the Metropolitan Management Acts, and not paved to their satisfaction, and that it was expedient to pave it completely, it was resolved that it should be so paved, and that an estimate and apportionment of the expenses should be made. This estimate was afterwards made and approved, and the apportioned amount demanded of the appellant according to the provisions of section 105 of the Act of 1855. He refused payment, and thereupon these proceedings were instituted. The magistrate held that the road, both carriage and footway, was a "new street" within the Acts, and that the appellant was liable. He accordingly ordered payment of the sums claimed, subject to the opinion of this Court on the question whether he was right in point of law in holding the road to be a "new street." Now in the earlier statute, although the term "street" is defined by section 250, the term "new street" is not, and whether a street were a "new street" or not seems to have been treated in each case as a question of fact. But by section 112 of the Act of 1862 (25 and 26 Vict. c. 102) it is enacted "that the expression 'new street' shall apply to and include all streets hereafter to be formed or laid out, and a part of any such street, and also all streets the maintenance of the paving and roadway whereof had not previously to the passing of this Act been taken into charge and assumed by the commissioners, trustees, surveyors, or other authorities having control of the pavements or highways in the parish or place in which such streets are situate, and a part of any such street, and also all streets partly formed or laid out." It is also thereby enacted that the word "pave" shall apply to and include the formation of the roadway or footway of any street. It was contended by the appellant that the footpath should have been treated as distinct from the roadway, and that, assuming the roadway to be a new street within the Acts, the footpath was not, inasmuch as it had been paved, repaired and taken in charge prior to the Act of 1862 by the public paving authorities. And it certainly does appear somewhat strange that an owner whose premises abut on a public footway repairable by the inhabitants at large, and which has been repaired by the public authorities at the ratepayers' expense, should afterwards be called on to pay a proportion of paving expenses in respect of that footpath simply because the paving authorities resolve to treat it together with a roadway which has not been repaired or taken in charge. But, after a careful consideration of section 112, we are of opinion that Camberwell Green Road, treated as a whole, does come within the definition there given of "new street." It is, when so regarded, "a place the maintenance of the paving and roadway whereof had not previously to the passing of the Act of 1862 been taken into charge and assumed" by the paving authorities. The paving of the footway had been taken into charge, but not of the roadway, and this street accordingly comes exactly within the words of the section. To remove it from the category of "new streets," both footway and roadway must have been taken in charge and assumed. And there is nothing, in our opinion, to prevent the authorities from treating the street as a whole, although the footway and roadway are both "streets" within the definition clause. On the contrary, we think the section contemplates that streets should be so dealt with. It may be observed that section 150 of the Public Health Act, 1875, furnishes an example of similar legislation. Under that section the frontager on a street may have liability cast upon him, even although a part of the street consist of a footway repairable by the inhabitants at large. It is, however, suggested that the case of "The Vestry of St. Giles's, Camberwell, *v.* Hunt" (56 "L. J." M. L. 65) is a decisive authority in favour of the appellant. There a local authority had in 1876 paved out of the general rates the footpath of a new street. Ten years later they resolved to pave the same footpath again, under section 105 of the Act of 1855, at the expense of the adjoining owners. It was held that they could not do so, on the ground that they had already exercised their powers under that section over exactly the same place. No such question as that now raised arose. The magistrate, moreover, in that case found that the paving done in 1876 was, and was intended by the vestry to be, of a permanent and not of a temporary character, and had been done under section 105 of the Act. In the present case the magistrate has found that the work done on the footpath was temporary only—such, in fact, as would be done to a highway under section 98 of the Act of 1855, and not under section 105. The case referred to, therefore, is distinguishable and is quite consistent with the conclusion at which the Court has arrived. The decision of the magistrate must be affirmed, and this appeal dismissed with costs.

THE MACKARNESS MEMORIAL.

A MEDALLION with the head of the late Bishop Mackarness of Oxford has been placed in Christ Church Cathedral on the south wall of the south aisle, adjacent to the memorial to the late Prince Leopold. The medallion, which is of silver bronze, was designed by Mr. Leonard Stokes, the work being executed by Mr. Frampton. The late bishop's head, looking in profile towards the communion table, occupies the upper portion of the bronze, and in the space in front of the face is indicated the head of a crozier. Below is the inscription in raised lettering. The whole is surrounded by a square border of cherubs' heads in low undefined relief, the top line of which is broken by a shield bearing the arms of the see marshalled with those of the family. This is surmounted by a bishop's mitre. The features of the late bishop have been reproduced with much fidelity. The medallion has been subscribed for by many friends throughout the diocese of Oxford, who were anxious that there should be some permanent memorial of Bishop Mackarness in his cathedral city.

THE HOUSE OF COMMONS.

WHEN members of the House of Commons return to their legislative avocations, they will find, says a correspondent of the *Birmingham Post*, that during the recess certain intentions of the Clerk of the House (Mr. Palgrave) have been carried out. That gentleman desired to mark various positions of great historical interest within the Palace of Westminster; and, with the approval and aid of the Office of Works, this is now being done. In St. Stephen's Hall, for instance, a brass plate will for the future tell of how this—through which every visitor to the House must pass—occupies the exact site of St. Stephen's Chapel, built in the reigns of Edward I. to Edward III. and from 1292 to 1364, assigned to the use of the Commons in that of Edward VI., and in which their last sitting was held on September 25, 1834, the ancient building being destroyed by fire on the ensuing October 16. Marks are also placed in the floor to show where stood the Speaker's chair and the Clerk's table; and another tablet at a little distance indicates the line of demarcation from the old lobby, in which Perceval, when Premier, was shot by Bellingham, in the second decade of this

century, and through which Mr. Gladstone alone, among all who are now in the House of Commons, has passed as member. And, proceeding from St. Stephen's Hall to Westminster Hall, no one who has a trace of historic sentiment will pass unnoted the record that "This tablet marks the spot where Charles Stuart, King of England, stood before the High Court of Justice" on four fateful days in January, 1649, and that it was there he heard sentence of death pronounced upon him; or that other which shows where stood the bar which divided the Court by which Charles Stuart was condemned from the body of "the hall of Rufus." To Mr. Palgrave and all concerned, in fact, thanks are due for so excellent a fulfilling of a worthy task.

TESSERÆ.

Greek Sculpture.

THERE can be no doubt that the traditional excellence of the Greeks in sculpture is very inadequately represented in the large collections of works that have reached modern times. The museums of Europe possess, with very few exceptions, but repetitions and often indifferent Roman copies of the more celebrated productions of the great masters of Athens, Sicyon and Argos. It is true the motive and general spirit of the ancient feeling and intention, so remarkable in the simplicity and repose of the compositions, may be traced in the numerous statues and *rilievi* that abound, but however valuable they may be in the estimation of antiquaries and scholars, usually very incompetent judges of technical excellence in art, and however useful in illustrating the history, the customs, myths and poetry of their age, how limited is the number of those which, if judged by competent, practical opinions, can be classed as examples of perfect sculpture? It is, indeed, remarkable how very few of the monuments that have been preserved can be identified with works particularised by ancient authors. The names and titles which have been given to many well-known statues, as the *Fighting* and *Dying Gladiators*, the Townley Venus, the Theseus (Brit sh Museum), the so-called Jason and others, are but conjectural, and are open to question. In like manner the subjects of some of the most extensive compositions, the groups in the pediment of the Parthenon and of the temple of Jupiter Panhellenius (Ægina), for instance, are still matters for antiquarian inquiry and discussion. It must be remembered that we are indebted for nearly all the information we possess on these subjects to writers who lived long after the most flourishing period of Greek sculpture; their accounts must, therefore, be received with due allowance for their incompleteness and imperfections. Amongst those especially noted for their records of art are those diligent but somewhat indiscriminating collectors of the gossip of their time, Pliny and Pausanias. In the curious compilation of the former, extending to almost every class and variety of subject, the account of celebrated works of art and their authors seldom extends beyond a mere catalogue of names, without detailed description, and is never heightened by any useful criticism; a circumstance the more to be regretted because Pliny distinctly refers to the interesting fact of many ancient artists having written on their art, but from whose works he gives no extracts. In Pausanias there is more particular description of the works he saw in his travels, but even here there is no attempt at criticism. Happily some rare specimens are extant to prove that the tradition of the superlative merits of the great Athenian and other schools has a true foundation and is not a mere superstition. So long as the sculptures of the Parthenon, with its grand pedimental statues and groups, the vigorous compositions of the metopes and the frieze of the cella exhibiting the busy scene of the Panathenaic procession; so long as the Venus of Milo, that noble personification of the highest class of mature female beauty; so long as the bronzes of Siris, the medallions of Syracuse, and a few other undisputed and unrivalled monuments of these schools are preserved, there will be sufficient evidence of what the great masters of that glorious age of sculpture could and did achieve. But such works as these are exceptional in their supreme excellence, and it is no disparagement to the ancients and no undeserved compliment to the more eminent modern sculptors to assert that, where they have studiously imitated the classical types, their productions will bear favourable comparison, in technical qualities, with the average ancient statues that are now found crowded together in collections of such objects. It is in the motive and sentiment that the modern works are deficient necessarily, and it can only be for their material qualities that productions bearing the nomenclature of the classical poetry, but without its spirit, can deserve the commendation claimed for them.

Greek and Roman Pottery.

The Greeks and Romans employed two distinct materials in their pottery, one of which yielded a coarse, almost granular, not very homogeneous or uniformly coloured and very porous mass, and the other, which yielded a body beautifully homogeneous, a porcelain-like grain and very dense. The amphoræ, cinereal and lachrymal urns, in which the ashes were placed in the tombs, were made of the first-mentioned substance. The amphoræ were often of gigantic size, sometimes from 8 to 10 feet in height and 3 feet in diameter. The celebrated tub of Diogenes was an amphora of this kind. In Spain enormous jars called "tinajas" are made for holding wine, oil, flour, &c. Two localities are especially celebrated for these articles, Castello de los Jarrès and Colmenar de Oréja, not far from the celebrated royal residence of Aranjuez, where jars 13 feet high and 7½ feet in diameter are made. Similar vessels are also used in the south of France and in Italy, and indeed in all the Mediterranean countries, though perhaps not of such a remarkable size as the Spanish ones. The statues and finer vases and tazzas of antiquity were frequently coloured in the clay, some black, some brownish red, and others of a beautiful sealing-wax red, hence named terra-sigillata. In addition to this colour of the body the surface was usually coloured, the statues, architectural ornaments and tombs being often green or blue, and the vases or tazzas being sometimes ornamented with black silhouette-like figures on the red body, these being considered the most ancient, while those with the figures in red, buff and white on a black ground belong to the highest period of Greek art. Three different classes must be noticed, those with black figures on a red ground, those with brownish-red figures on a black ground, and yellowish-white or buff-coloured figures on a black ground. The body in all cases is red, in imitation of terra-sigillata, the black figures being made in a sort of clay pigment worked up with quick-drying oils and subjected to a considerable temperature, the black colour being thus produced by charcoal. Many of the old vases were also covered with an exceedingly thin glaze or glass consisting of silica, iron and soda which must have been very pretty. This glaze has been found to consist of a combination of silica and soda, or rather of clay with that substance, being in fact a true glass, but we are ignorant whether, like our modern salt-glazed ware, it was formed with salt. This species of glazing appears to have been known at a very early period, for many articles, especially bricks, glazed in this way have been found at Nineveh, some even of various colours, and Herodotus mentions the walls of the palaces of Ecbatana, in the empire of the Medes, were painted of seven colours, meaning in all probability walls built of these coloured and glazed bricks. The Greeks and Romans do not appear, as far as we are aware, to have used glazed pottery (although well acquainted with it) to the same extent as the Eastern nations. They did not consequently make any improvements, at least any which have reached us.

Water-Colour Drawing.

Turner in his practice showed how entirely he appreciated what may be termed the genius of the materials he used. Just as in oil he never failed to take advantage of its power of solidity, combined with transparency, so he never sullied the lovely quality of transparency in water-colour—its very essence and spirit—with opaque mixtures. It is as great an error in artistic practice merely to stain a canvas with thin washes of oil-colour as it is to pollute water-colour with opaque mixtures; and when the moment arrives that a water-colour draughtsman finds he cannot give expression to his artistic feeling without the use of solid colour, let him at once become an oil-painter or work in distemper. The use of splotches of permanent white (a great misnomer, by the way) amidst transparent water-colour is as incongruous and inharmonious in its results as is the ruling of skies by machinery, combined with hand-work, in modern engraving. It may be with truth asserted that in no one of Turner's completed drawings will a touch of opaque colour be found. He occasionally, though very rarely, used it in his sketches from nature, where he desired to get with the utmost rapidity the effect which at the moment impressed him; but these sketches were almost always made upon tinted paper, where the necessity for using opaque white may be said to be absolute. It is to be feared that the temptation to produce drawings with rapidity and comparative facility has been the chief cause of the general adoption of a practice which Turner pronounced to be so pernicious. A water-colour draughtsman who cherishes the pure and beautiful ground he works upon for his lights, or, if he has lost this, scrapes or washes them out, has a far harder and more anxious time of it than he who, by the aid of opaque mixtures, dabs them on in a moment and renews them at pleasure. It may, however, readily be conceded that another and worthier reason for the use of opaque colour is the yearning of the artist to have substance and solidity in his material; but when he feels this, and that he is flagging in devotion to those qualities of art which water-colour, and water-colour alone, can produce, he should become an oil-painter, and cease to be a water-colour draughtsman. The art of pure water-colour is entirely free from that element of evil which is an enduring source of vexation to every true painter in oil, and to get rid of which his choicest devices are put in practice, namely, the sense and look of the material paint, and some of the loveliest effects in nature are far more touchingly

and truly rendered in water-colour than in oil. It is a trite remark to say that there is no rule without an exception; and it would not be right to quit this subject without calling attention to the practice of William Hunt—one of the greatest amongst the great men already referred to. During the latter years of his life, and especially in his marvellous studies of fruit and flowers, there is no doubt that he used opaque colour freely, but in a manner and with a skill entirely his own. In his drawings there are no dabs and splotches; but the opaque stuff is so hidden up and blended that without minute examination we scarcely detect its presence. But, beautiful as these works are, a comparison between his former and latter styles would show the great and undoubted superiority of his earlier work in pure and refined artistic qualities. The very exceptional nature of Hunt's practice in this respect is clearly shown by comparing it with that of one as great as he, David Cox. It may be truly said that every touch of opaque colour in the drawings of this admirable artist now exhibited gives a pang of grief to the spectator, marring and blurring, as it does, his otherwise beautiful workmanship.

Veleia.

The ruins of Veleia are situated only twenty-one miles distant from Piacenza, but the place is not much noticed by travellers. There are grounds for supposing that Veleia was destroyed in the fourth century of the Christian era, but in what way is unknown. A tradition of the country, however, exists that a torrent of water descended from the mountains Moria and Rovinazzo which overwhelmed the ancient city of Veleia. The probability is that this tradition is correct, for the town is found to be buried under enormous masses of stone and earth, quite analogous to the composition of these neighbouring mountains, and the name of Rovinazzo may be conjectured to have been given to one of them after this mischance. The discovery of the ruins took place in 1746, when a peasant pursuing his agricultural labours in a field found what is called the "Tavola alimentaria" of Trajan, a most curious historical monument which proves that the Emperor supported 279 poor children of both sexes. This table, though of metal, was broken in various pieces and dispersed, part of it being sold in different places. It was in contemplation to make a church bell of one of the pieces when a canon of Piacenza redeemed it from the steeple. Thirteen years afterwards, in 1760, digging was commenced for the sake of making discoveries on the spot where the table had been found. The forum was soon laid bare, with various monuments placed above and around it. Statues and inscriptions rewarded the labours of the search, and the Prince of Parma took sufficient interest in the operations to order a house of wood to be constructed for himself and his court that they might witness the progress of the excavations. In 1765 the digging ceased and had scarcely been again renewed until 1816, when the Archduchess Maria Louisa paid a visit to Veleia and ordered further researches to be made.

Allston, the Painter.

Washington Allston was a native of South Carolina, and born in 1779. He says of himself, in some notes sent to Mr. Dunlop, that the turn for imitation and composition had shown itself as early as six years old. His delight was to put together miniature landscapes of his own invention, built up with moss, sticks, pebbles and twigs representing trees, and in manufacturing little men and women out of fern stalks. These childish fancies, he says, "were the straws by which an observer might then have guessed which way the current was setting for after life. And yet, after all, this love of imitation may be common to childhood. General imitation certainly is, but whether adherence to particular kinds may not indicate a permanent propensity I leave it to those who have studied the subject more than I have to decide." When at Harvard College he attempted to paint in miniature, but "could make no hand of it." Before he left college his future career was determined. Left early master of himself, he sold his paternal estate for the purpose of studying in Europe. He had generous friends, who came forward with offers of aid, who would fain have prevented this sacrifice of his property. But Allston, with the high spirit which through life distinguished him, refused these offers, and threw himself, at once and finally, on his own resources. He arrived in England in 1803, was received by his countryman, West, then president of the Academy, with his usual urbanity and kindness, and by Fuseli, not always courteous, with distinguished courtesy. There seems to have been, from the first, an immediate and intelligent sympathy between these two poetically gifted spirits. Allston confesses that he then thought Fuseli "the greatest painter in the world"; and he retained a more qualified predilection for him ever after. His preference of Fuseli to West at that time, favoured as he was by the attention and kindness of the latter, marks the poet, for such Allston was. Fuseli asked him what branch of art he intended to pursue; he replied, "History." "Then, sir, you have come a great way to starve!" was the characteristic reply. The effect which Sir Joshua's pictures produced and left on his imagination also stamps the particular bent of his mind and character. He said, happily, "There is a fascination about them which makes it almost ungrateful to think of their defects." Allston remained two years in England and exhibited three pictures, one of them (a comic subject, too) he sold. This was beginning well. In 1804 he went to Paris, studied and meditated in the Gallery of the Louvre, then rich with the spoils of nations, copied Rubens in the Luxembourg, and proceeded to Italy, where he remained four years, residing chiefly at Rome, where Thorwaldsen was his fellow-student. His feeling for what the grand old masters have achieved was deep—was genuine. They grew upon his mind as they do on all minds large enough to take them in. In his appreciation of Michel Angelo he agreed with Sir Joshua. "I know not," he said, "how to speak of Michel Angelo in adequate terms of reverence!" Allston was not satisfied with reverencing the old masters and copying their pictures; he imitated their mode of study and devoted much time to the modelling of the figure in clay. That boldness and firmness of drawing and foreshortening which he displayed in his pictures, even his smallest compositions, may be traced to this practice. He said, late in life, "I would recommend modelling to all young painters as one of the best means of acquiring an accurate knowledge of form. I have occasionally practised it ever since." At Rome Allston acquired, among the native German painters, the name of the American Titian, and there he formed a lasting friendship with Coleridge and Washington Irving. He said of Coleridge, "When I recall some of our walks under the pines of the Villa Borghese I am almost tempted to dream that I had once listened to Plato in the groves of the Academy. It was there he taught me this golden rule, 'never to judge of a work of art by its defects,' a rule as wise as benevolent, and one which, while it has spared me much pain, has widened my sphere of pleasure." Notwithstanding his sensitive taste, Allston remained to the end of his life "a wide-liker," to borrow his own expression.

The Temples of Agrigentum.

Imagination can scarcely conceive a more glorious prospect than that which the southern cliff of this great city once displayed, surmounted by a long unbroken line of the finest monuments of Grecian art. Amongst them stood six majestic temples, of that severe Doric order which so happily combines elegance and simplicity with solidity and grandeur. The south-east angle is still seen crowned with the ruinated colonnade of Juno Lacinia surrounded by broken masses of its entablature: next to it is a very fine temple nearly entire, except the roof, commonly supposed to have been dedicated to Concord, being indebted for this extraordinary state of preservation to the piety of those ages which converted it into a Christian church. That of Hercules, the next in order, seems to have been demolished by the violence of an earthquake, as it lies in all the confusion which such an overthrow would be expected to occasion. This was one of the finest temples of Agrigentum, and held by the citizens in peculiar veneration; in size and plan it resembled the Parthenon of Athens, and contained several *chef-d'œuvres* of painting and statuary. Its inimitable picture of Hercules strangling the serpents was presented to the Agrigentines by Zeuxis; the adytum was adorned with a miracle of art, a statue of the presiding deity by Myro, who inscribed his own name upon the thigh in small studs of silver. Cicero, in his lively description of a nocturnal attempt made by the emissaries of Verres to carry off this statue, takes notice of a circumstance which shows how similar are the effects of superstition in all ages; he observes that its mouth and chin, though made of bronze, were actually worn by the kisses of its admiring votaries.

Imitation in Egypt.

Many false stones, in the form of beads, have been met with in different parts of Egypt, particularly at Thebes; and so far did the Egyptians carry this spirit of imitation, that even small figures, scarabæi and objects made of ordinary porcelain were counterfeited, being composed of still cheaper materials. A figure which was entirely of earthenware, with a glazed exterior, underwent a somewhat more complicated process than when cut out of stone and simply covered with a vitrified coating. This last could therefore be sold at a low price; it offered all the brilliancy of the former, and its weight alone betrayed its inferiority; by which means, whatever was novel or pleasing from its external appearance was placed within reach of all classes, or at least the possessor had the satisfaction of appearing to partake in each fashionable novelty. Such inventions, and successful endeavours to imitate costly ornaments by humbler materials, not only show the progress of art among the Egyptians, but strongly argue the great advancement they had made in the customs of civilised life, since it is certain that until society has arrived at a high degree of luxury and refinement artificial wants of this nature are not created, and the lower classes do not yet feel the desire of imitating their wealthy superiors in the adoption of objects dependent on taste or accidental caprice.

NOTES AND COMMENTS.

IN proposing a toast at the jubilee dinner of the Royal Scottish Society of Arts in Edinburgh, Mr. BRUCE PEEBLES, C.E., was able to refer to many distinguished scientists and other notabilities who had been members of the Society. Among them were Sir DAVID BREWSTER, Dr. ABERCROMBY, Professor ALISON, Sir WM. MAXWELL, Sir HENRY ERSKINE, Sir THOMAS DICK LAUDER, Professor CHARLES HOPE, Lord JEFFREY and Professor FLEEMING JENKIN. Mr. PEEBLES also said that the invention of the screw-propeller and other inventions of world-wide reputation had been due to members. The President of the Society pointed out some of the improvements which had taken place since the Society was founded in 1841. As regards railways, the first volume of the Transactions contained a paper by the late Mr. DAVID STEVENSON upon one of the railways of England, in which were recounted some things that at that time were thought very extraordinary. The remarkable fact that the locomotive department of that railway spent the enormous sum of 28,000*l.* in one year was mentioned, and that the engines were driven by a driver with the aid of a fireman. "As a check on their regularity," the paper went on, "a fine of 2*s.* 6*d.* is imposed on the engineer for every fifteen minutes he arrives before his time." For the following papers, read during the past session, medals and other distinctions have been awarded:—"On an Electrical Bench for Physiological Research," Dr. R. MILNE MURRAY; "On an Improved Mining Theodolite," JOHN WHITELAW, C.E.; "On a Hospital Table and Ambulance Appliances," W. B. BLAIKIE; "On some Mechanical Appliances for Demonstrating Geographical Problems," W. B. BLAIKIE; "On the Phonograph," C. R. JOHNSTON; "On the Telegraph Exhibits at the International Exhibition," F. GRANT OGILVY; "On the Telpher and Electric Railways at the Exhibition and on Electrical Traction," E. MANVILLE and J. G. STATTER; "On Electrical Navigation," A. R. BENNETT; "On Glazed Cast-iron Pipes for Water and Soil," T. SAUNDERS; "Notes on a Method of Testing Boiler Economy, and the results of such a Trial," Professor T. H. BEARE; "On the Kettering Sewage Purification Works," WILLIAM FAIRLEY; "On a Pedal Vice," L. ROTTENBURG; "On Electrical Traction," M. HOLROYD SMITH; "On the International System of Water and Sewage Purification," HENRY M. CADELL; "On a Description and Comparison of the Systems of Electric Lighting at present in use in London," Professor A. B. W. KENNEDY.

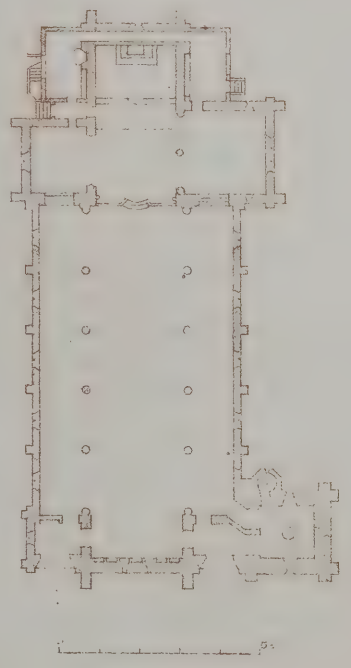
IT might easily be imagined that not many new cases relating to light and air could turn up, but one that in most respects was novel came before Mr. Justice CHITTY on Wednesday. It appeared that in 1873 a man who was the testator from whose act the proceedings issued erected a house in a field. He died two years afterwards. In his will he bequeathed the house to one legatee, and the field in which it was situated to another. Fields are not worth much for agriculture, and the new owner proposed to convert his into building land. The question then arose about the respective rights of the parties. Did the possessor of the house acquire rights for ever over the field as regards light and air, or was the owner of the field legally entitled to build houses that would obscure the light from the windows? Mr. Justice CHITTY set aside the peculiarities of the case. He treated the house as if it had been disposed of for a valuable consideration; that is, he regarded it not merely as a structure, but as being endowed, as it were, with important and extraneous qualities which it was the duty of the Courts to protect. His lordship said that if the owner of a house and field by deed for value grants the house, but retains the field, it is settled law that a right to the light required for the enjoyment of the house passes to the grantee, because "the lights are a necessary and essential part of the house." In other words, what is conveyed is not a mere brick or stone building with apertures called windows, but a house with windows enjoying light. This is the broad, substantial reason which commends itself at once to the common sense of mankind. Worked out somewhat more technically, the conveyance operates as an implied grant of the light. Blocking up the windows by the grantor is regarded as an attempt on his part to derogate from his grant—a form of expression which assumes that the right to light has passed to the grantee. The implication does not necessarily arise upon a mere perusal of the deed itself; generally the situation and ownership of the adjoining field is not disclosed, but the implication of grant arises *primâ facie* so soon as the facts are ascertained that the light required for the windows passed over the field, and that the grantor was owner of the field at the time of the grant. On these facts being known, and in the absence of any other special circumstances, the law imputes to the parties an intention that the easement of light should pass with the house by virtue of the grant. The house devised to the plaintiffs contained windows so constructed as to involve a necessary dependence, in order to its enjoyment of light, upon the adjoining tenement. Light is an apparent continuous easement, and of course must be treated with as much respect as if it were something in a more material form. By arguing in that way his lordship could not come to any other conclusion than that the owner of the field had no right to obstruct the access of light to the house, and therefore judgment was given for the plaintiffs.

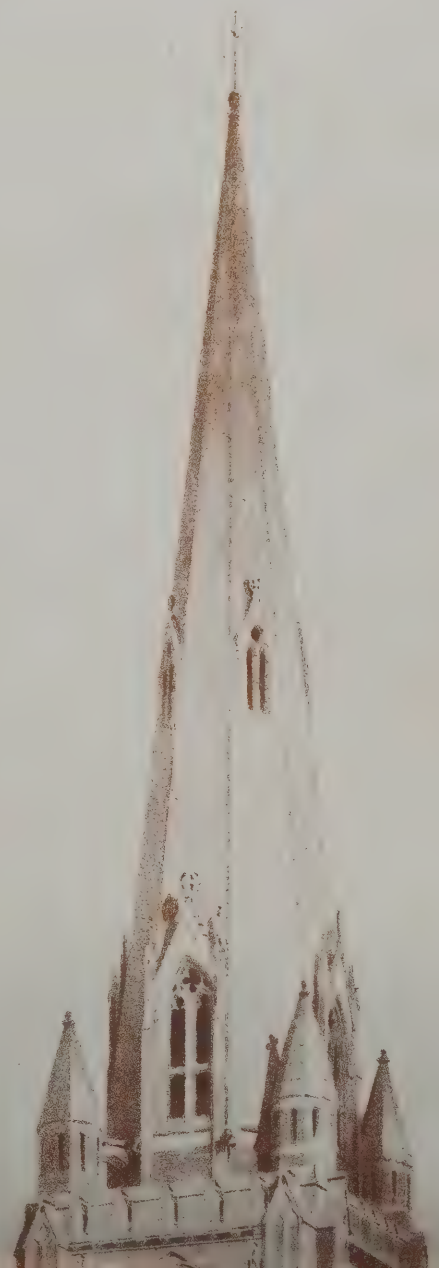
THE exhibition of MEISSONIER'S works will be held in the Ecole des Beaux-Arts, Paris, next year, from May 1 to May 31. In addition to the ordinary catalogue, it is intended to produce one that will be illustrated and costly. In order to facilitate the arrangements, the owners of paintings by the artist who are willing to lend their treasure are solicited to inform the committee as soon as convenient. The treasurer and principal agent in the affair is M. EDOUARD DETAILLE, who was one of M. MEISSONIER'S few pupils. The last exhibition of M. MEISSONIER'S works in Paris was got up by the artist himself, in order to aid a night asylum. The money derived from the forthcoming exhibition will be applied towards the erection of the memorial of the artist, which is to be erected in the garden that is on the site of the Tuileries.

AN ample supply of water is available for Dublin, but it is becoming more difficult every day to deliver the full quantity throughout the city and those parts of the suburban districts that are dependent on the Vartry reservoirs. This is owing to the diminution of the pipes by an incrustation of oxide of iron, which takes away on an average an inch from the capacity or discharging power of a pipe. In some streets the pipes are nearly filled by the deposit. The defect will continue to increase. As it is impracticable to clean the pipes, the Corporation of Dublin are about to apply for a Provisional Order or Act of Parliament which will authorise the laying-down of a second line of conduits. This operation will cost about 150,000*l.*, but when completed the water can be turned into the new pipes, and the others will then be scraped and cleansed. The contemplated outlay is a large sum to have to pay on account of defects, especially as the existing pipes are comparatively new, but the incrustation is due to the quality of the water.

IT is not improbable that the coming year will bring an alteration which will be almost a revolution in the administration of the French museums and galleries. At present most of these are open to all visitors for the greater part of every week without payment. It is now proposed to adopt the opposite plan, and insist on payment for admission, at least upon four days in a week. The principal cause for the change is the necessity for obtaining money to meet the expenses. Votes for museums are grudgingly passed, and as a rule the amounts are much reduced. Barely enough is granted to pay the salaries of the officials, which are all fixed at a low rate, and other indispensable expenses, and the curators cannot take advantage of the chances which are offered from time to time for obtaining objects for the collections. It is considered that the admission fees will amount to a large sum in a year. At present a scheme is being considered by the French Government for saving a part of the money, and with it and other sums which may come in founding a credit which can be utilised for acquisitions. It is likely to be approved, for the administration would occupy the spare hours of many legislators.

S. Oswald's Church, Small Heath, Birmingham





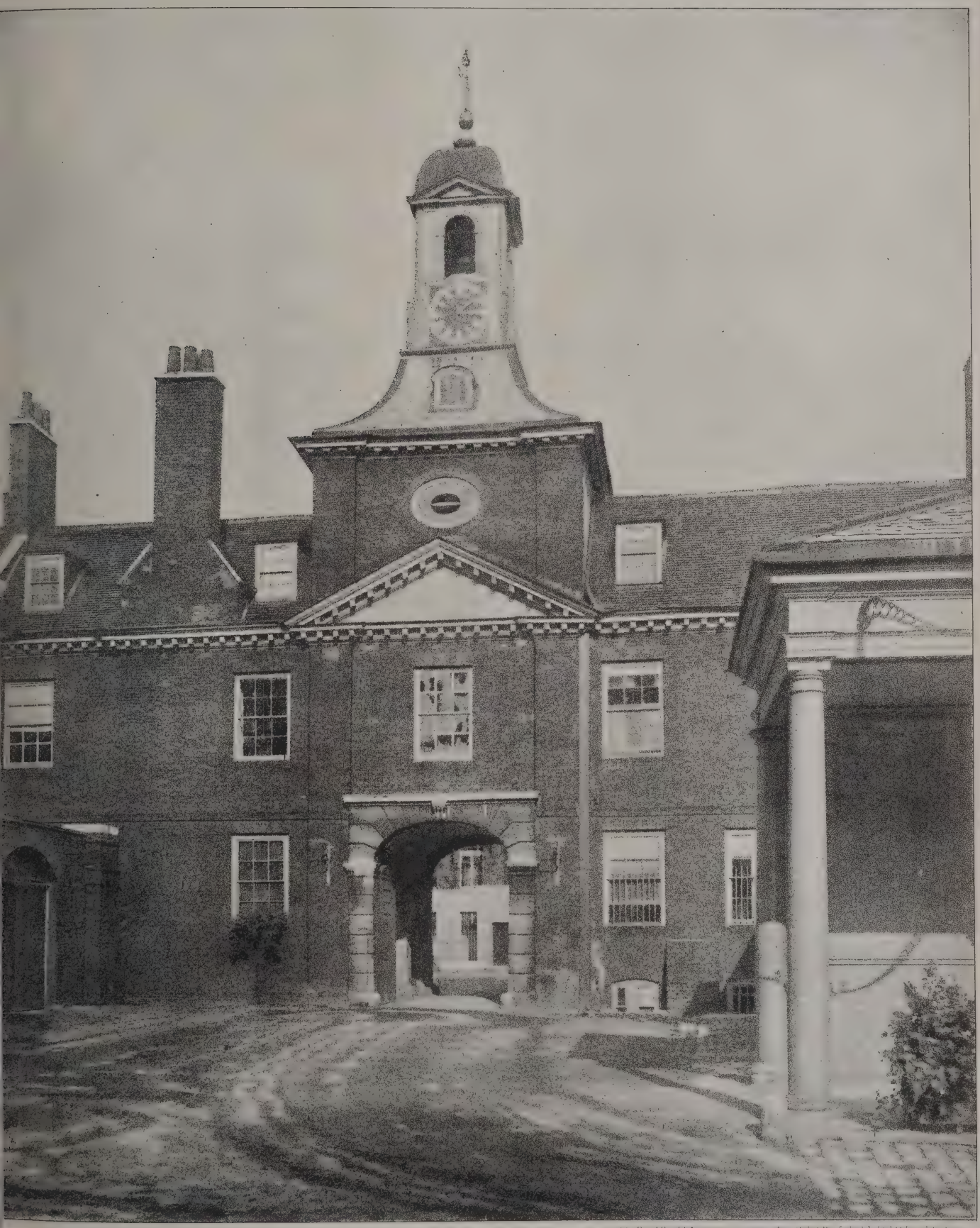


INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



INK-PHOTO SPRAGUE & Co 4 & 5, EAST HARDING STREET FETTER LANE, E.C.

OLD HOUSE: WEST STREET, CHICHESTER.



ENTRANCE: KENSINGTON PALACE.

SIR CHRISTOPHER WREN, Architect.





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ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 433.—HOUSE AT CHICHESTER. [SIR C. WREN.]

NO. 434.—ENTRANCE, KENSINGTON PALACE. [SIR C. WREN.]

ST. OSWALD'S CHURCH, SMALL HEATH, BIRMINGHAM.

AN OLD MILL, NORTH WALES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary meeting of the Institute of Architects for the present session was held on Monday evening, Mr. J. Macvicar Anderson, president, in the chair.

The PRESIDENT delivered his inaugural address, from which the following is taken :—

President's Address.

Of the many subjects of interest to which I might direct your attention, there is, perhaps, none which more directly affects the profession, through the medium of this Institute, than that of examination. I deem it, therefore, superfluous to offer any apology for proposing to occupy some portion of your time in a review—retrospective and prospective—of this subject; and should I appear in so doing partially to tread once more a well-beaten track, I venture to hope that the importance of the subject will justify me in craving your indulgence and attention. I am led to enter on this inquiry because the attention of this Institute will shortly have to be directed to the propriety or otherwise of establishing an examination for admission to the class of Fellows, and if I refer particularly to this now, it is not certainly with the intention of forestalling the deliberate judgment of the Council, by whom it has yet to be considered, and whom I have in no way consulted, collectively or individually, but because I think it desirable that the subject should be brought under your notice, with the view of being maturely thought over, prior to any decision being arrived at.

I may say at the outset that I am of course aware that there are some within the Institute as well as outside of it who are opposed to the policy of examination, and who, considering it prejudicial to the welfare and highest interests of the profession, would deprecate its extension. To such, especially those who are members, I may reasonably urge that the day has gone by for raising objection or inaugurating opposition. No one can allege that the policy was not maturely considered prior to its adoption in 1882, and its subsequent confirmation by Royal Charter in 1887, and I apprehend that any who now find themselves honestly opposed to it should feel loyally bound by the decision of the majority ; and if on principle they are unable to take an active part in the scheme of examination, they should at least avoid any action which may tend to injure or to minimise the influence of the Institute in the honest endeavour to raise the standard of knowledge and efficiency, and so to promote the highest interests and the credit of the profession.

But what is the argument on which this opposition to examination is based? You will find it embodied in a memorial which was presented to the Council, and in a letter which the memorialists published in the *Times* last March, under the title of "Architecture : an Art or a Profession?"—words which appear to me to suggest under an attractive form an entirely false issue, and one which in its essence is misleading. To declare that architecture is an art is to repeat a truism ; it is not only an art, but a fine art, to which in some respects the sister fine arts of painting and sculpture are handmaidens in a sense which cannot be said of architecture in relation to either of them. I yield to none in my appreciation of the nobility of our calling as the embodiment of the highest form of art. Painting and sculpture are luxuries that can be indulged in only by the rich, but architecture is a necessity felt by all, the poor no less than the wealthy. A civilised community must have houses to live in, schools and colleges to learn in, offices to work in, hospitals to be sick and to be visited in, houses of parliament to legislate in, palaces of justice to enforce law in, museums and galleries to exhibit objects of art and science in, and, though last not least, cathedrals and churches to worship God in ; and what nobler or more elevating occupation can be conceived than to design with fitness and clothe with beauty those permanent necessities of everyday life, so that each in its turn may contribute to the convenience and the pleasure of mankind? But architecture is more than all this. It is an art *and* a profession. To ask whether it is an art or a profession is not only, in my judgment, to put the subject in an incomplete and a misleading form, but to endeavour to divorce two things which are indissoluble. Why, the unique characteristic of our calling is that it combines such different qualifications—artistic taste, scientific knowledge, business proficiency. We have no claim to be architects in the true and full sense of the word unless we are artists, able so to dispose and to clothe the materials with which we have to deal as to produce beauty of form and proportion. But we must also be scientists, so familiar with the strength and properties of materials as to combine them in sound construction ; and we must, moreover, be men of business, so conversant with affairs as to be able to protect the pecuniary trusts which are committed to us. Of what good to society would be the most graceful design in architecture if it were so devoid of constructive merit as to collapse? Or, conversely, what claim has the most perfect construction to architectural merit unless clothed with beauty? The body politic of architecture is composed of parts, each one of which is essential to the unity of the whole, and without any one of which it would be incomplete and useless to society. There are those amongst us whose proclivities and aspirations are specially artistic ; there are those whose genius is constructive ; there are those who *par excellence* are men of business. The ideal architect is the man in whom these qualities are united, who is an artist, a constructor, and a man of business. It is given to few to excel in all, though there are many who, possessing a general knowledge of each, are proficients in one or the other. And is one who is distinguished by artistic taste to regard with indifference or a species of contempt others who may be less artists and more scientists? Or is one whose genius is construction to look askance at others who are more purely artists? As well might the foot say to the hand, or the eye to the ear, "I have no need of thee," as if the one or the other were the body. No, architecture is not merely an art, it is not merely a science, it is not merely a profession ; it is the combination in one of the artist, the constructor, and the man of business, and any who claim that it is one only, to the detriment of the others, detract from the nobility as well as from the unique character of their calling. They vainly strive to disintegrate things which are inseparable, and which must go hand in hand. As well seek to sever cause from effect ; as well assert that root and stem have no part in producing the rich foliage or the delicate flowers on which the eyes of man feast with delight.

While thus advocating a spirit of catholicity and tolerance it is evident that the association of those whose feelings and aspirations are in unison is not only natural, but within proper limits productive of benefit, and is only to be regretted when through the undue preponderance of party feeling it ends in schism. There should be no room for schism here, yet I know of at least one member who retired from the Institute because he thought it did not sufficiently represent the artistic element in architecture, and I know of others who, for this or cognate reasons, decline to become members. I have every sympathy with the feeling that the Institute should be an artistic guild, but I demur to the action of those to whom I refer, for I maintain that the Institute does represent the artistic side of the profession, and to leave it, or to refuse to join it, on such grounds as I have indicated, is but a poor compliment to those of our number who are admittedly among the first artists of the day. Moreover, such action seems to me to spring from a narrow and schismatic view, and to be tinged with extraordinary inconsistency, for if it were the case, which I do not admit, that the Institute is insufficiently representative of art, surely the proper course for those whose sympathies are specially artistic is to strengthen the artistic element by their presence, and not to weaken it by their absence. With regard to all such I feel sure that I express the pervading feeling when I say that we deplore their absence, and would willingly extend to them a friendly and cordial greeting as fellow-workers in our noble art, for the Institute does not claim to be the home of any school or party, but to represent, in its widest and most elastic sense, the profession of architecture.

But to pass from the general to the particular, let me refer to the argument embodied in the memorial to which I have referred. It is said that "while it is possible to examine students in construction and matters of sanitation, their artistic qualifications, which really make the architect, cannot be brought to the test of examination ;" consequently that the attempt to test the knowledge of art by examination is delusive and calculated to militate against the interests of architecture as a fine art.

Is this so? Art has a history, which there is no difficulty in teaching, delineating its varied forms and combinations in different ages, and tracing such combinations to their sources, the usages, peculiarities and requirements of succeeding generations ; and is it not of the highest benefit to the artist, in developing his mental faculties and aspirations, to become thus familiar with the history of his art? But what of the theory and practice of art? Are not these systematically taught in architects' offices, in the classes and schools of the Royal Academy in this country, the Ecole des Beaux-Arts and other schools in France, in many kindred institutions on the Continent, and in the schools of art and of design throughout this

country which have tended so greatly of late years to improve the designs of our textile fabrics?

If then the history, the theory and the practice of art are thus imparted by teaching, with what truth can it be asserted that to test such acquired knowledge by examination is detrimental to its highest interests? No one is so foolish as to contend that any one ever has been, or ever will be, made an artist by examination; but no more will any one pretend that an artist ever has been, or ever will be, created by teaching; for the spirituality of art, so to speak, is inborn, and cannot be imparted. But much that is valuable, if not essential, to the career of an artist can be, and is, taught, and to test knowledge thus attained cannot possibly do any harm; while, on the other hand, it may be, and I believe is, productive of nothing but good to the student. It is one thing to acquire knowledge in a general way by study; it is another thing to test the application of such knowledge, and to root it in the memory, by examination. And is not this test the experience of all from the cradle to the grave? In childhood, as at school and college, is not the acquisition of all knowledge tested by examination? Does not the entrance to most professions and callings consist of some such test? Is not the experience of life a continuing examination? Society consists of two classes—employers and employed; if the latter are found deficient in the knowledge they profess, they will soon cease to be employed. Do not artists themselves habitually subject themselves to examination by submitting their works at the Royal Academy and elsewhere to the test of public approval? Do not our own so-called art members voluntarily accept the same principle when they engage in competitions, and submit their knowledge of the art they profess to the test of examination by promoters and assessors? There is not a man living, be he artist or not, who, in some form or other, does not undergo the test of examination at the bar of public opinion? Can it then be that the single exception to this universal experience should be found in the year of grace 1891 at No. 9 Conduit Street? and can our modest, though honest, endeavour to raise the status of our members and the credit of the profession be truly described as detrimental to the highest interests of the art which we profess and love?

You are all aware that the Charter enacted in 1887 not merely that "every person desiring to be admitted an Associate shall be required to pass or to have passed such examination or examinations as may be directed by the Royal Institute," but also that "after the expiration of five years from the date of this our Charter, the Royal Institute shall have power to declare that every person desiring to be admitted a Fellow shall be required to have passed such examination or examinations as may be directed by the Royal Institute." Thus, while the qualifying examination for Associates was made compulsory, the institution of a similar examination for Fellows is permissive only. It is significant that a date should have been specified on and after which a declaration might be made relating to an examination for Fellows, showing that the possibility, if no more, of instituting such an examination was at that time contemplated by the Institute. The specified period on and after which it is permissible to make a declaration on the subject will expire next March, and it seems to me, therefore, by no means premature to invite your attention to the matter now. There are, of course, several methods of dealing with the subject; for example, the powers granted by the Charter being permissive, the Institute may elect to take no action, or to declare that it is expedient to defer taking action, or to declare that on and after a specified date no one, except under certain conditions, shall be admitted a Fellow who has not passed such examination as the Institute may have established. In order to assist us in forming a correct judgment, it is pertinent to inquire what has been the result of the compulsory examination for Associates established in 1882. For the purpose of comparison, it will be only fair to exclude the two years immediately preceding that date, during which an exceptional influx of Associates occurred, from reasons into which we need not inquire too curiously. I propose, therefore, to take the eight years from 1872 to 1880, and to compare them with the eight corresponding years in the succeeding decade, viz. 1882 to 1890. During the former period the number of Associates who were elected was 246, or an average of thirty-one per annum, while in the latter period the number of Associates who were elected was 328, or an average of forty-one per annum. It is to be observed that this latter average would have been still larger had the whole of the 533 candidates who applied to be examined been passed, or had the whole 366 who were passed been elected. It is, moreover, worthy of note that since the year 1887, when the compulsory examination for Associates was confirmed by royal charter, a remarkable increase in the number of applicants has occurred, for in the four succeeding sessions there were no fewer than 375 candidates, of whom 262 were elected, being an average of sixty-five per annum. It thus appears that while prior to the institution of the compulsory examination for Associates in 1882 the average of annual elections was only thirty-one, since that date the annual average has been forty-one; and further, that since the confirmation of the examination by royal charter the annual average has been sixty-five. These are facts which cannot be controverted, the significance of which is remarkable. Bearing in mind that the abnormal number of Associates who were admitted in the two years immediately preceding the establishment of the compulsory examination must have reacted prejudicially against the number of candidates for some years thereafter, the figures I have quoted can only be regarded with extreme gratification, for they afford irrefragable evidence that the compulsory examination has not exercised a deterrent effect so far as Associates are concerned, but, on the contrary, has actually formed an incentive and an inducement to join the Institute. This result may surprise some, but it is really no more than might have been anticipated, for it is obvious that membership acquired by means of the test of examination becomes a much more valuable and valued possession than if it had been acquired only by means of a money payment.

The result therefore of nine years' experience of the compulsory examination for Associates is that the public have the guarantee that there are at least 376 of the rising generation of architects who have proved by this test that they possess such technical knowledge of architecture as has justified the Institute in enrolling them as Associates in pursuance of its chartered rights. This is satisfactory, but it is still more so to reflect that in course of time, when the present generation shall have passed away, there will be a similar guarantee in respect to every Associate of the Institute. Were our numbers to remain as they now are, that would apply to 800 Associates, but the figures I have quoted prove that the class of Associates is increasing by rapid strides, and I entertain no shadow of a doubt that by the time I refer to the number, if not doubled, will be vastly more than it now is.

But this is not all. It is well known that unless with a definite object in view study is apt to be desultory, and is often neglected. In order to pass this examination a systematic course of study has necessarily to be engaged in, a vast amount of useful knowledge is acquired, and who will say that these 376 Associates of the Institute are not better men and will not be better architects from the enforced study and the acquired knowledge that they owe to the compulsory examination? Now, I ask, seeing that examination has resulted in the addition of so large a number of qualified Associates to the list of our members, why should not a similar result attend the extension of the same policy to the class of Fellows? The question is not so much why should Fellows be subjected before election to such a qualifying test as why should they be excluded from advantages which the other class of members has derived from it? Surely there is nothing in the relative constitution of the two classes which can render it undesirable that a treatment eminently successful and beneficial in the case of the one should not be applied to the case of the other. The Institute deliberately adopted in 1882 the policy of examination as the qualification for membership as Associates, and we shall be no more than consistent if in 1892 we take advantage of the permissive powers of the Charter and extend the same policy for membership as Fellows. Not to do so indeed would seem to imply one of two things: either unaccountable inconsistency or the conviction that the policy has failed as regards Associates—an assumption which would be untenable and absurd in view of the facts and figures which I have placed before you.

As the result of a careful review of the whole subject, I feel no hesitation in expressing the decided opinion that, in pursuance of the permissive powers of the Charter, the Institute should next year declare that on and after a date to be specified, "every person desiring to be admitted a Fellow shall be required to have passed such examination or examinations as may be directed by the Royal Institute."

In the event, however, of this policy being adopted, it should be understood that the words of the Charter, "But in special cases the Council shall have power to dispense with such examination or examinations," should be liberally interpreted for a period of years, for the obvious reason that there are men now in the profession enjoying extensive practice, to whom, should they propose to join the Institute, it would be manifestly absurd to apply the test of examination.

That there are difficulties which will have to be anxiously and carefully considered, I fully realise; but to say that there are difficulties to face is to tell us only what is common to all human enterprise: if regarded with timidity, they become rapidly exaggerated—if manfully wrestled with, they dissolve like the hillside mist before the rising sun. To go no further there rises on the threshold the question of examiners. Perhaps all are not aware of the arduous nature of the labours of the Board of Examiners, labours which are entirely gratuitous, which incur a grave sacrifice of time—in other words, money—and involve a great deal of consideration and study. For these labours, freely contributed during the last nine years by the chairman and members of the Board of Examiners in carrying out and developing the examinations for Associates, the Institute owes a deep debt of gratitude which no mere words can adequately express. For some time it has been to me

apparent that it is too much to expect a continuance of such gratuitous labours, and if, in addition to the existing examinations another should be instituted, the question of some form of recognition would have to be considered. This, however, is not a difficulty which can or ought to be regarded as insuperable; for, although our funds may at present be somewhat straitened from causes to which I may refer by-and-by, it is clear that means must be provided for the efficient support of an organisation which I look on as vital to the best interests of the Institute.

Before leaving the subject of examination, let me briefly refer to what some seem to look on as its necessary goal—registration. The inevitable evils which must accompany the adoption of any scheme of legal registration are admitted, even by its most ardent advocates. The preliminary question, therefore, which rises on the threshold of any consideration of the subject is, whether these evils are likely to be outweighed by counterbalancing advantages? It is no doubt regrettable that any one, whether qualified or not, should be at liberty to engrave "architect" on his door-plate; but it would be vastly worse, and only justifiable under the pressure of the gravest necessity, to legally register as a qualified architect every carpenter, auctioneer or undertaker who now has the effrontery to call himself so. And after all is the existing evil so great as it is made out to be? It may be thought a little humiliating to find tradesmen assuming to be qualified practitioners in a learned profession, but the pretension is so absurd as to secure its own defeat. There are a sufficient number of educated and qualified architects; if the public have not such intelligence and regard to their own interests as to discriminate now between them and the persons I have referred to, no Act of Parliament will endow them with it, any more than it will prevent quacks from finding means to impose on them. The Architects' Registration Bills which in recent years have been promoted in the House of Commons have failed in providing machinery that would remedy this evil. The mere enactment that no one could under penalties use the word "architect" unless legally registered would not meet the difficulty. There are numerous and obvious loopholes for the evasion of such legislation. I object to the proposed Registration Bill (1) because it is not called for; an essential preliminary to such legislation being that it is demanded by the profession, instead of being promoted by a few individuals who can in no sense be said to represent it; and (2) because it would inevitably fail in effecting the object set forth in the preamble. So far, therefore, as I am concerned, without doubting the *bona fides* of the promoters, I shall continue to oppose by any influence I possess such crude and uncalled-for attempts at legislation, which have only tended to confirm my original conviction that the remedy would be worse than the disease. I indulge in the prospect, the fulfilment of which I may not live to see, when every member of the Institute, whether Fellow or Associate, will be a qualified architect in the sense of having passed an examination instituted by his brethren as the necessary qualification for membership; for this, with the continual increase of our members which every succeeding year will see, is in my judgment the true solution of registration and would sufficiently meet any difficulty, such as the public is now said to experience, in discriminating between qualified and unqualified practitioners. The affixes F.R.I.B.A. and A.R.I.B.A. would in such circumstances and in the eyes of the public mean much more than they now do, for they could then only be used by those who had passed the test of a qualifying examination. Reference to these letters tempts me to remark incidentally that it is a pity some of our members appear to attach comparatively but little value to them. The initials F.S.A. must, I suppose, be assumed to have some magic influence with the public which our own F.R.I.B.A. do not possess, for they are always placed first. Why should this be? Can it be said that to be a Fellow of the Society of Antiquaries is a better qualification for an architect than to be a Fellow of the Royal Institute of British Architects? This anomaly, however, time will remedy.

In a foregoing paragraph I have incidentally referred to the state of our finances being less satisfactory than could be wished. We have perhaps enough to pay our way, but not much more, and that is not a budget which satisfies my notions of sound finance. I should like to see a much larger margin than has ever existed between income and expenditure, and to provide such a margin is the goal to which we should seriously strive to attain; for although there is perhaps no particular object in amassing a large capital, it would certainly be desirable to add to our present vested funds and thereby provide for future extension of premises, or for the acquisition of others more suited to our continual expansion; and it would be no less desirable to be able to set apart a yearly sum for the remuneration of examiners, and to contribute towards the encouragement of professional education in such forms as may from time to time appear best. I am far from thinking that there are not good reasons for the steady increase of our expenditure. The position which the Institute has of late years assumed in taking a more aggressive attitude in respect to public questions of architectural interest, the organisation of the standing committees, the machinery of the scheme of examination, the opposition to some and the support of other Bills in Parliament, the extension of our relation to allied and colonial societies, are all causes, and legitimate causes, of increased expenditure which has to be met out of income. Each of these causes contributes to the necessity of an increased staff, in order to carry on efficiently the work of the Institute. But, while granting all this, I maintain that we are not justified in living up to our income, but that we should, on the contrary, live well within it. How is this to be accomplished? Obviously by adopting one of two possible alternatives. Either we must reduce expenditure, or we must increase income. In respect to the former, I do not say it is impossible; but, after careful consideration, and guided by many years' experience of the working of the Institute, I do say that I can discover no considerable item of expenditure that can be saved without detriment to our welfare and influence. There remains the other alternative—the expansion of income—in which, in my judgment, is to be found the true solution. But is this practicable? By way of reply, let me put another question, which I desire to address directly to each one of our members. What has each one of us done, individually, personally, to increase our membership? How many of us have been the means of inducing ten others to join the Institute? How many five? How many one? You are all familiar with the parable of the man who called his friends and neighbours to rejoice with him because he had found what he valued. In the exercise of the same spirit, surely it becomes us, if we value membership at all, to use our personal influence with professional friends and neighbours, by pointing out the advantages of belonging to a strong representative society, the essence of whose constitution is the promotion of the best interests of architecture. Now, it must be assumed that the Fellows and Associates of this Institute do value membership, or they would not be where they are? Why, then, should we continue selfishly to enjoy privileges, when, by exercising a more liberal spirit, others by a very slight effort on our part might be led to participate in them? Let each one of us evince somewhat less apathy in this matter. There are now 1,366 professional members. Should I be so happy as to influence, say one-fifth only in the direction I desire, think what the result would be—such a substantial addition to our income as would provide at once the margin I so strongly desire to see created. Let me press these suggestions on your notice, with the view of giving to them practical effect. But let no one misunderstand me. I am not pleading, *ad misericordiam*, as if our position were a weak one. It is not so—far from it; rather is it a position of growing influence. I desire, by awaking members to a sense of their responsibility, to see it strengthened financially, in order that we may enlarge the sphere of our operations and of our usefulness. There is probably no more legitimate or more hopeful method of attaining this end than by means of the societies in Scotland, Ireland and the provinces, which the Institute, by virtue of the powers of the Charter, has admitted to alliance. We do not claim merely to represent metropolitan but British architects; hence we now have twelve allied societies, and at our first business meeting it will be my privilege to propose that the Dundee Institute of Architecture, Science and Art be admitted to alliance, thus increasing the number to thirteen. By means of such alliances we are kept in touch with representatives of local opinion and practice at the principal centres of life in the kingdom. The interest of all is identical, and cannot fail to be promoted by united action. I desire to see the Institute strengthened by the admission to its ranks of many members of our allied societies, by whom, I do not hesitate to declare, the advantages of membership will year by year be increasingly appreciated, in proportion as year by year they become more fully realised by the public. Moreover, when the Institute is called on to advise a Department of State, it cannot but add emphasis to our counsel when, as in a recent instance, such counsel is confirmed by the cordial support of our allied societies.

In connection with the subject of membership, I may briefly refer to a privilege which appears to have been inadequately appreciated on some recent occasions. Whether the principle of the ballot, as applied to such elections as ours, is expedient or otherwise, may be matter of opinion; it is significant that both the Institution of Civil Engineers and the Surveyors' Institution have abandoned it; there are those who look on it as an unmanly subterfuge for avoiding an honest expression of opinion; while, again, others consider it a convenient method of recording their vote without incurring personalities which might otherwise follow. The question of the ballot has, as you are aware, been raised in this room, and has been referred by the Institute to the Council, who have appointed a carefully selected committee—composed not exclusively of their own number—to consider the whole subject and report thereon.

To those whose professional practice lies within the metropolitan area, much inconvenience has of late years been experienced by the complications resulting from the numerous

statutory additions which have been made at different times to the Metropolitan Building Act of 1855. It is satisfactory, therefore, to know that the Local Government Board propose to introduce, during the ensuing session of Parliament, a London Building Law (Consolidation) Bill, the object of which is stated to be "to consolidate the Metropolitan Building Acts" and "certain sections of the London Council (General Powers) Act 1890." This will prove an undoubted convenience and advantage, so far as it goes. But it will only deal with one-half, and that the least serious half, of the question. The Metropolitan Building Acts are admitted by all who have occasion to refer to them to require not only consolidation, but amendment. Some clauses, if not obsolete, have been so successfully evaded as to have become practically so; some, if rigidly enforced, inflict hardship, while, on the other hand, they contain no enactment respecting such subjects as foundations, drainage and sanitation, which vitally affect the health and welfare of the community. Hence when, in August, the President of the Local Government Board courteously forwarded a copy of the proposed Consolidation Bill and invited suggestions thereon, I did not hesitate, after consultation with Mr. Cates and the officers of the practice standing committee, to represent the importance, or rather the necessity, of accompanying this measure by an Amendment Bill, inasmuch as only by means of consolidation and amendment can the Building Acts meet the requirements of the present day. The practice standing committee, during the last two years, has been engaged in the serious task, involving great labour and research, of preparing a complete draft of a suggested Amendment Bill; and this, when it has been approved by the Council, will in due course be forwarded to the President of the Local Government Board. Let us hope that the issue may be the introduction in due time of a Consolidated and Amended Building Act, such as the necessities of the time require.

A review of the architectural events of the year would be incomplete without some reference to the new departure of the Architectural Association embodied in their curriculum. The subject being one of considerable importance, not merely to the Association, but to the profession, we were glad to afford every facility for its full discussion in this room towards the close of last session. The able and lucid exposition then given by the president, Mr. Baggallay, and the exhaustive discussion which ensued, render it needless to attempt any delineation of the scheme now, and I refer to it only that I may embrace the opportunity of heartily commending it to the sympathy and support of members of the profession.

Among the numerous architectural competitions of the past year, there is one which, alike from the magnitude of the work and from the manner in which the competition was inaugurated, deserves more than a mere passing notice. I refer to the limited competition for the completion of the South Kensington Museum.

In a national work such as this, no one could have cavilled had the Government themselves nominated the architects who were to be invited to engage in the competition, but they were evidently actuated by the desire to make the best as well as the most fairly representative selection. Hence, having limited the number of competitors to eight, they nominated four, and requested the Council of the Royal Institute of British Architects to nominate the other four. This laudable desire to consult the profession through its representatives in a matter of national importance is, I think, highly creditable to the Government, and demands recognition at our hands.

The Congress of Hygiene and Demography which was held in London in August, and proved so great a success, treated of some subjects which are of interest to members of our profession.

The consideration of open spaces occupied some of the time of the Congress. Essential as it is, however, with the view of promoting the health of the community, to provide parks and gardens wherever practicable, it is if possible even more so to make our streets worthier of the name of open spaces than they can now be said to be. Narrow streets and lofty houses are the natural and inevitable result of concentration. When people must live within a prescribed limit it is necessary to pack close; land assumes a fictitious value, and in order to secure a return on capital invested, houses—which cannot be extended laterally—are carried to an abnormal height. This, being the outcome of circumstances which are beyond control, constitutes a difficulty for which it is not easy to suggest a remedy. Something may be done by legislation. The London Council (General Powers) Act, 1890, has already prescribed a statutory limit to the height of buildings, which is so far good as being a step in the right direction. I cannot but think, however, that this limit is excessive, and certainly too great to exercise any hygienic effect. In theory the true restriction would be to regulate the height of buildings by the width of the streets in which they stand, but obviously such a rule could not be applied to London without inflicting injustice. It is necessary, therefore, to prescribe a general limit, and to allow no departure beyond it except with the sanction, specially obtained, of the County Council; and I should be disposed to advocate that such limit should be fixed at 70 feet instead of 90 feet, as prescribed by the Act of last year. We cannot, however, hope to effect much in the direction desired without the sympathy and concurrence of landowners. The interest of the freeholder is no doubt to get as much as the leaseholder will give. But it is no less true that the real interest of the landlord is not always best consulted by the exaction of the full pound of flesh, and I would venture to suggest that large landowners in London would do well to adopt the more enlightened policy of considering concurrently with their own interest the general welfare of the public, by inaugurating such improvements and granting such concessions as the exceptional circumstances of this huge metropolis demand. In illustration of this, and to demonstrate its feasibility, I would refer to the liberal and enlightened policy displayed by the Duke of Westminster in the management of the Grosvenor estate, by increasing the width of streets and restricting the height of houses. Such a policy means the sacrifice of so much rent-bearing land, as well as the acceptance of a smaller ground-rent than would be obtained without restriction of height; but besides conferring a distinct advantage on the public, it must in the long run react for the benefit of the landowner himself by rendering his estate cheerful and attractive.

Contemporary architecture exhibits vigour and originality of treatment, and many features that command admiration, even amid much that, in London at least, is discouraging. When, for example, we reflect that of the thousands of houses erected yearly in this metropolis, the vast majority are not designed by architects, but by clerks and employés of speculating builders, one is tempted to despair of the domestic architecture of London; and it does seem strange that, in face of this patent fact, the public and the daily press persistently make architects responsible for abortions with which they have had nothing whatever to do. It is bad enough to be deprived of the opportunity, except in comparatively rare instances, of showing what our domestic architecture might be if designed by specially educated artists; but it is monstrous that, although so deprived, we should yet be held responsible for the grotesque productions of men who are uneducated and whose minds are innocent alike of refinement and taste. To bring about so magic a transformation as that the architecture of London might become the work of architects would require the wand of an æsthetic Prospero; but something may possibly be attained by more prosaic means. I understand, for example, that in granting new leases the Duke of Westminster stipulates in his building agreements that architects shall be employed, again setting an example which other large landowners would do well to emulate, not so much on the lower ground of encouraging the employment of architects, as on the higher ground of by means of their employment improving the street architecture of London.

There is such a thing as selfishness in design—it may not be so common as the same quality in life, but it cannot be said to be rare: the indulgence in quaint personal conceits or idiosyncrasies, not necessarily beautiful because novel, instead of the manly effort to curb mere selfish quixoticisms, and to produce results which will be pleasing to the refined taste of others, because in harmony with what is beautiful. But it is surely possible to be unselfish in art as in life, and to indulge in almost infinite variety of treatment without offending the educated taste of others by disregarding those principles of artistic design which the testimony of past generations has approved as contributing to beauty; and we may rest assured that we can only transgress such established canons of art at the risk of probable if not certain failure.

A noticeable instance of selfishness in architecture, although not such as I have now referred to, is afforded by the additions to King's College now in course of erection at the eastern end of the river façade of Somerset House. I know not who is responsible for this building, and I can therefore speak with freedom respecting it; I know not what justification can be urged for it on the plea of necessity; but I do know that to have studied the requirements of accommodation only, without regard to cherished surroundings, is, in such a case, selfishness of the worst description. One would have fancied that the façade of Somerset House, which has been admired by past generations, as it will continue to be by generations yet unborn, would at least have been held sacred from innovation or injury, but in this, as in many other things, we live to learn; and it is with astonishment and grief that I see what I regard as one of the grandest public buildings in London wantonly sacrificed to the unneighbourly selfishness of modern utilitarianism. Should it be possible still to take action with the reasonable prospect of a successful issue, I shall be glad to join in any movement having for its aim the removal of a structure which cannot fail to excite the indignation, not merely of lovers of art, but of all, because our public buildings are trusts for the protection of which each generation is responsible.

Mr. ALFRED WATERHOUSE, R.A., late president, said he considered it a great honour to be one of those called on to

give expression to their feelings of gratitude to the President for the address he had just delivered, and which had been listened to by all of them with so great attention. It was a noble address which they should not listen to once and then forget, but they should read over and over again, ponder over it and endeavour to carry its precepts into practice. He should not attempt to traverse the ground gone over in the address, it would only weary them. One or two remarks he would confine himself to. First he would call attention to what the President had said on the controversy that appeared in the *Times* whether architecture was an art or a profession. None among them, and none of those who took part in that controversy could regret it had taken place when they listened to the words of the President in treating the subject and his definition of the ideal architect as a three-sided creature, an artist, a skilful constructor and a man of business. Those words seemed to sum up the whole controversy in a nutshell. If there are any outside the pale of the Institute who thought that the members were devoting themselves too much to science and to business, why did not they come within the pale and restore the balance? The examinations, hitherto so successful in their results, were destined to be still more successful when the progressive examinations came into force and students obliged to begin systematic study from the commencement of pupilage. The Fellows of the Institute would in future times be drawn from the ranks of distinguished Associates, but he hoped the Institute would always reserve the means of opening the door to architects of extraordinary ability who might not be able to enter by the ordinary way. As to the Board of Examiners, all of them, he thought, would echo the President's words. What they had done was beyond all praise and beyond any remuneration they were likely to receive at their hands. Mr. Waterhouse proposed a vote of thanks to the President for his address.

Colonel Prendergast seconded the vote. He urged the importance of a better understanding of architects by the public and expressed his pleasure in hearing the President call attention to the flagrant case of one of the noblest buildings in Europe being spoiled by one of the most vulgar of additions. In regard to the lock-out of the carpenters, he said no better arbitrator could have been appealed to. He also mentioned that the President had made it the first condition of his accepting the office of arbitrator was that "the war should cease" there and then, and so allow some happiness to return to the wretched homes which had known none for so long.

Mr. Waterhouse put the vote to the meeting, and it was carried amid hearty acclamation.

The President thanked the members in a few brief words.

On the proposition of Mr. Aston Webb, seconded by Professor Kerr, the following resolution was passed :—"That this meeting desires to call the attention of Her Majesty's Office of Works and Public Buildings to the injury now being done to the architectural effect of the river front of Somerset House by a building in course of erection at the east end of it under the authority, it is understood, of King's College, and hopes that steps may yet be taken to mitigate this injury."

The meeting then closed.

THE ARCHITECTURAL ASSOCIATION.

THE second ordinary meeting of the Association was held on Friday evening, Mr. F. T. Baggallay, president, in the chair.

Donations to the general fund and to the library were announced, and the thanks of the meeting awarded to the donors.

The following gentlemen were elected members—Messrs. J. Richardson, A. R. Hill, F. H. Mercer, R. A. V. Harrison, C. O. Nelson, W. C. Bigg, D. Horn, F. A. Whitwell, W. Hodgen, W. O. Thomas, W. D. Colmer, C. E. Hutchinson, W. Carpenter, A. St. Quentin, C. S. Joseph, T. Henwood, F. D. Clapham, G. E. Withers, A. M. Watson, J. Blyth, S. E. Knott, F. S. Hammond, E. Tyler, T. Ballantine, R. H. E. Hill, R. Angell, R. F. Summers, R. E. Walton, A. Gilbertson, E. W. Lees, W. K. Shirly, A. H. Hawkins, A. J. Johnson, F. A. Meakin, W. V. C. Smith, C. Kensington, A. E. Hodson, U. C. Wood, O. F. Stenning, R. P. Griffiths, T. N. Dinwiddy, E. S. Austen, E. C. Lall, E. G. Simpson, M. Zimmermann, W. J. Childs, T. J. Fox, N. W. Harrison, H. P. G. Maull, R. Robertson, E. Whitle, G. C. Beresford, L. Shruffrey and H. N. Kerr.

The President announced that whatever course might be followed in future under similar circumstances, the committee had decided to nominate Mr. Farrow for re-election as vice-president. The statement was received with acclamation.

Mr. W. H. Bidlake, M.A., then read a paper on

Pitfalls on Commencing Practice.

The first great question with the newly-hatched is, he remarked, to get a client. You must have put up a house for somebody before anyone will trust you to put up a house. The wisest course is not to commence until you have secured your first job from an old family friend, or won it in competition. Dead charges must be kept as low as possible. Better to share an office in a good neighbourhood than have a garret to yourself up a break-neck staircase, and "taking in washing" for other architects as evening work will pay office expenses better than going to the theatre. When at last a client calls, first impressions are everything; personal dress and manner, evidence of order and system in the office, readiness to grasp ideas, and that indescribable air of confidence in self, which wins the confidence of others. Above all things, beware of unpunctuality; every excuse for it falls flat. It is well to get to know something about your client. Had I done so on one occasion I should have avoided a pitfall. For my client got more than I did. He got five years' penal servitude, and I only got my expenses as a witness, less 4*s.* 6*d.* for the warrant, and with the balance I bought my experience. After giving his ideas, a client always says he has very little money to spend, and wants the work done as cheaply as possible. The reason he says this is because there is a deep public distrust of architects about money matters. He would not be satisfied if you took him at his word. What he requires is his full money's worth in arrangement, construction, material and design. At the same time, very clearly understand his meaning on the money question, and remember Cutler *v.* North. A building enterprise is quite a novelty to him, and he comes to an architect to be told how to set about it, and trusts him to see him through with it without either loss or embarrassment. His ideas are often very vague and unpractical. You have to help him to define what he wants. Sometimes you will have to save him from himself, to even assume a kind of authority over him, and say: "That would not do; this must be so." He will come with a pet idea, which he has been nursing with pride. You see at once the impracticability of it; but don't contradict him. You may offend, but you will not convince. Best to conciliate with a compliment or a graceful remark, before saying anything unacceptable. If you take his idea, and it is unsuccessful, he will forget its parentage and reproach you with it; or he will say, and rightly so, "I came to you, as a specialist, to be advised." If, on the other hand, his idea is successful, do not be surprised if he takes credit for the whole work, plan, design and all. Have a distinct understanding about your personal retainer and the scale of remuneration. If the arrangement is in any way unusual, have its limits well defined. Endorse any verbal agreement by a letter, and keep a copy of it. Some architects regard their clients with feelings akin to antagonism. This is a most dangerous state of mind to begin with, and fruitful of evil. Your relationship with your client is intimate and confidential. Make him your friend. Be perfectly open with him, and make him conversant with all the steps of the undertaking. Throw yourself with enthusiasm into his interests. Forget that you are working for a definite remuneration. If you are doubtful as to how to act on any occasion, imagine yourself to be your client for the time being, and, whatever befalls, it would be suicidal to quarrel with him. If first impressions are important, parting impressions are still more so. Always part friends. You will avoid a difficulty if you explain to him very clearly the question of "quantities," the extra 1½ or 2 per cent. will give him a shock at first; for, in all probability, he will be quite ignorant of the custom. Let him understand that you employ a surveyor as his agent; that if the contract is executed the contractor will pay the surveyor, but that if it is not executed it will devolve upon him to do so. Take care you do not entangle your client with the authorities or his neighbours. Look well to the question of street frontages and party walls, and be very cautious with underpinning. If any bill for damage is presented, he will be very angry with some one, if only for the relief of his feelings, and that some one will be his architect. The question of "ancient lights" presents a peculiar difficulty in the light of a recent legal decision. The architect is placed on the horns of a dilemma. He may either advise adjoining owners of the extent of his building, and so bring various exacting claims upon his client, which would otherwise never have been preferred, or he may ignore the question of "ancient lights" and incur the risk of having to mutilate the building to accommodate them, when it is more or less complete, with the certainty of a good quarrel with his client, and the possibility of an action by the latter to recover damages. The best thing to do is to discuss the matter very fully with the client, and allow the responsibility to rest with him. In fact, one-half the pitfalls into which the architect stumbles arises from the want of a full discussion and a clear understanding. Mere verbal agreements are often worse than useless—the two disputants are sure to have different versions of the same interview. Have everything in black and white. Do not trust in the honour of your friend or client in a question of moment, for however honourable he may be, you are sure to quarrel with him in the end. No; endorse verbal agreements by a letter and keep a copy, and enter an account of the interview or any important particular into your diary. And a diary, by the way, should be an indispensable adjunct of every

office. Letter-writing is either a virtue or a vice. It is a good servant and a bad master. When the writer is not known personally, his character is implied from his letter. Frequently letter-writing keeps an architect in touch with his surroundings, and a client is flattered by receiving a letter from time to time, and feels assured of his architect's interest in the work. But remember that, when posted, a letter is beyond recall, and—for good or evil—you are wedded to the opinions expressed in it. I try myself to get into the habit of regarding the possibility of every business letter being brought into a court of law. Clients are always in a hurry to commence work. Do not encourage it. Preliminary drawings are not to be dashed off against time, as you commit yourself by them to the broad lines of your design. Prettily got-up sketch drawings are a delusion and a snare. You are gratuitously preparing your client for disappointment. And, as for an estimate of cost, it is like an infernal machine, and is not to be handled with light-hearted carelessness. Do not commit yourselves to figures when you can help it; but, if you do, be sure your figures are correct. You may depend upon it you will be held to them afterwards. Do not court responsibility, it is a golden rule for an architect; and beware of lady clients. Precautions desirable with a client become imperative with a committee. It has been observed that committees and corporate bodies are sometimes capable of meanness and questionable transactions which each individual member would repudiate in private life. An architect must study men as well as materials, for he has to do with both. The committee meeting is a field for his tact, and it is often required. Meetings of educated business men are usually agreeable and methodical, but less educated men rush into windy talkativeness and open contention. Let the greengrocer have his talk out; it is his first opportunity of expressing his opinions to a wider circle than his own fireside. But do not descend to the fray. Do not commit yourself until the fight is over, and then, in the lull after the storm, your words will break upon the stillness with a clear and incisive authority. A committee usually consists of one who leads and the rest who follow, and it is the leader, of course, that the architect has chiefly to reckon with. At the same time, he must hold himself perfectly independent. Once let an architect sacrifice his independence, and pitfalls will yawn around him on all sides. Do not receive any instructions whatever from an individual member of a committee unless you have proof of his being officially authorised to give them; and especially remember that nothing but the corporate seal will bind a corporation. If you are acting for a body of men, you must manifestly be instructed by them as a whole; the majority may repudiate the opinions of the individual, and throw the responsibility on you for having listened to them. Do not work for charity. Bricks cost money, so must brains. Besides, man cannot appreciate what he does not pay for. Neither make your remuneration subject to approval, or to the correctness of your estimate of cost. You may find, to your dismay, that, although you have prepared three sets of drawings, or any number of sets, and have spent endless trouble, the mere "not approved" of your client will annul all claim for remuneration. But, as you have voluntarily submitted to the arrangement, you have only yourself to blame. To the architect who has started in practice with few friends and less capital there comes a pinch which tests his fibre. It is just then that he is tempted to work "for charity" and on approval, in the hopes of getting a connection, and there will never be wanting those who will take advantage of his embarrassment. Accepting trade discounts and less remuneration than the legitimate 5 per cent. compromises his independence, and will be as an albatross round his neck for all his future career. With regard to the former, it seems to me better to have nothing to do with them, even if the client fully understands their nature and accepts the benefit of them himself. But on this point opinions differ. As for building speculation, touch not the unclean thing. Second-rate solicitors and impecunious builders are the best combination for that. With regard to the working drawings, it is a mistake to make them too showy or artistic. They are only a means to an end, and the end is that the building shall be worked out accurately from them. It is also a mistake to show too much detail on the eighth-scale drawings. At the same time, they must be thoroughly thought out and worked out, or else the architect will find himself in the deadly grip of "extras." If a thing will not work out satisfactorily on the drawings, it is a fallacy to suppose it will come right in execution; and the less ambiguous the drawings are, and the less they are left to the interpretation of the architect, the less disputing there will be with the builder. Do not accept the accuracy of plans or maps on the assurance of other people. Plot out the site for yourself, and do not try conclusions with the authorities. Sometimes one is tempted to sacrifice convenience to design. It is a pitfall. Beware in time. Either rearrange the parts so that the two do not clash, or else face the inevitable at once. If you do neither, some ghastly deformity will be arranged by your client to remedy the inconvenience. And who is to blame? If you build your chimney so low that it smokes, be prepared for the deformity of a cowl. Be sure of your construction. You are responsible for it. It is of course false economy to stint the strength or stability of the construction for the sake of ornamental character. In house-planning a wise architect takes the ladies into his confidence. Their chief requirements are plenty of cupboard-room, well-lighted steps to the cellar and a kitchen on the ground floor. Be sure and have plenty of head-room for staircases. On one of your visits of inspection the foreman will come up and say, "If you please, we can only get 6 feet head-room for the back stairs; we've tried it all manner of ways." And just then the client walks up from behind and says, "What's the matter?" Single steps and single winders are dangerous, and are generally signs of thoughtlessness. Warm the staircase, or the house will never be free from draughts; and if there is an unusually large surface of window in a sitting-room, such as a bay window, the cold radiation of the glass will always produce draughts if no special arrangement of hot-water pipes is introduced. Shut off the kitchen offices from the rest of the house and well ventilate them, or the smell of cooking will pervade the house. If the journey from the kitchen to the dining-room is long or circuitous the dinner will be cold. Place the bath-room over an unimportant room, so that if the bath overflows no great amount of damage will be done, and take precautions against water in the cellar. Consider the position of the furniture in each bedroom, and treat domestic servants as human beings, worthy of more comfort than a cheerless garret affords. If an architect is to avoid extras, a clear, concise and comprehensive specification is an absolute necessity, and it seems to me that the growing practice of entrusting it to a quantity surveyor is very much to be deprecated. An architect has not thoroughly thought out his building until he has written the specification for it. And when he has done that with great care, although not necessarily with great elaboration, he feels a sense of repose and confidence in the execution of the work not to be attained otherwise. In a specification vague terms are expensive items. To suppose a builder will adopt a better and more costly method of execution, unless you specify it, is to be too flattering to human nature, and to suppose that, even if you do specify it, he will execute it so unless you see that it is done, is to show some ignorance of the builder-nature in particular. Of course, there are exceptions to every rule. Do not try experiments in new materials and inventions. Let others do that. If you do it, it will probably be at the cost of your client's pocket and your own reputation. And, above all, allow for contingencies. If a thing is absolutely perfect, except under certain circumstances, those circumstances are bound to arise. When the working drawings and specifications are complete, let your client have both to look through. Better to make a modification even at the eleventh hour than that your client should not be satisfied, or that the alteration should be made after the contract is signed. Obtain an expression of his approval if possible; it may help to relieve you of responsibility. In connection with the actual building there are a hundred possibilities of oversight, which may lead to consequences most disastrous to the architect's reputation, but which a little care and attention to details might have avoided. Undoubtedly, the architect's position is a difficult one. Many are the operations in a building enterprise, and many are the hands engaged upon it. Each is liable to error or neglect, and, however attentive the architect may be, it is impossible for him to be always inspecting the building. And so matters of error or neglect become covered up and obscured in his absence, even if they are not wilfully hidden from him. Yet it is he, and he alone, who must bear the responsibility before the public. And the public will not stop to inquire into the difficulties of his position. "What is the good of having an architect?" will be the contemptuous question. And, although his building is admittedly excellent in plan, design and execution, yet all the good that he has done will not be remembered to him if a chimney smokes or the water comes into the cellar. This may be unjust, but it is a matter of experience. It behoves the architect, therefore, to pay minute attention to the details of construction, arrangement, ventilation, and the like, and to be very sure he is using good materials. If he has not used good materials, time and weather will soon expose the fact to the public. A correct judgment of materials can only come by experience, and even the most experienced are sometimes at fault. It is, therefore, all the more necessary to make the question one of close study. It is a misfortune that the education of an architect does not comprise a study of the distinction between good and bad material. Might not a museum of common building materials, good and bad, be a useful aid in the new educational scheme of this Association? Do not condemn the material unless you are sure of your judgment. A little friendly consultation in private with a man of experience will be very valuable. Although it is folly to allow bad material, it is possible to be hypercritical. An architect, like blindfold justice, must hold the scales equal between builder and client. It is a good rule to imagine

the builder present in all your dealings with the client, and *vice versâ*. Be sure of your foundations. Test the ground yourself. If you come to a soft part, have it cut out, and concreted, or the brickwork carried down; and step the brickwork from the higher to lower level. See that the footings are in, and have a greater spread where greater weight has to be carried. Beware of drawing off water from the foundations in sandy soils. It will be too late to think of these matters when the cracks of unequal settlement have appeared. Take the same precautions with drains. Have them tested in your presence. If they pass under a building, arch the walls over them; if they pass over new-made ground, carry them on concrete or on brick foundations. See that these things are done, and do not take the builder's assurance. Be sure that the damp-course is in, and see that the brickwork is built solid round all smoke-flues in hollow walls. If smoke once finds its way into the hollow space, it will be impossible to find the leakage, and endless annoyance to the client may be the result. Examine every fireplace to see that joists and purlins are not built into the flues or too near them. Tie in wall-plates, so that the roof will have no tendency to spread. See that roof principals have sufficient abutment, or efficient tie-rods. Take care that the mason has not cut the beds of a column hollow in order to obtain a fine joint, or the stones will fracture. If you have to argue yourself into the assurance that a beam is strong enough, you may take it that your judgment says it is not; therefore, make it stronger. When the roof-tiles are being laid, take care that the mortar-bedding does not extend too far down. If it does, water will be conveyed through the roof and drip on to the ceilings, and the client will write a letter to his architect acquainting him with the fact. The roof will have to be stripped. I do not think there is any other remedy. Take great precaution in plastering the interspaces between the rafters of church roofs, and allow a good air-space between the laths and tile-battens. Beware of internal gutters, and pockets where snow can accumulate. Carry chimneys well up, and give them some mass and breadth. The modern chimney is distinguished by its leanness. Guard against water soaking through brick sills, or driving under casements, or condensed moisture dropping from sky-lights. See that water-pipes are not exposed to frost, and do not trust any one but a thoroughly competent man to fix the kitchen cylinder, otherwise you will get into hot-water. Keep the gas-meter away from any source of heat, or the water will distil into the pipes, and there will not be a steady gas-flame in the house. Do not lay a wood-block floor until the concrete bed is quite dry, or the wood will swell and the floor "rise." And, above all things, beware of dry-rot. For a man who has spent a considerable sum in building a house to have to spend another 50*l.* on new floors and skirtings before he can inhabit it, will prove a great strain on his composure; and it would be an even greater trial to a committee which had collected its scanty funds with the greatest difficulty, to see them swallowed up by this seven-headed hydra without a murmur against the architect. Do not trust to caretakers; they are not to be supposed to have any intelligence. They will stop up the ventilation openings if they can, or else allow them to get choked with dirt. For the sake of your own reputation, urge your client or committee to have a periodic examination of all such air-inlets and of the under floor-space. The latter can be arranged by having movable floor-boards screwed down. You might also take similar precautions with regard to running the water out of heating coils on frosty nights, and also with regard to domestic servants letting soap, hair and the like get into sink waste-pipes. I now come to what is, perhaps, the most frequent and insidious pitfall of all, the accumulation of "extras." It is almost impossible to avoid extras, to some extent; but there is a reasonable limit beyond which they must not pass. Contingencies often arise which it is impossible for an architect to foresee, and no reasonable client would object to extras for such, even though he did not like them. When, however, an architect, in order to improve his design, incurs a heavy extra for a modification in the plans which his client has approved, he incurs a serious responsibility, and he may find that he has to refund the cost of his indiscretion. It is the wisest course to keep your client fully aware of the extras as they arise, and to obtain his sanction first to all those that are not quite trivial. If possible, obtain an estimate of extra work beforehand and submit it to your client for approval, and insert a clause in the contract that all extra work is to be valued at the same rate as that on which the tender is based. It is certainly most unreasonable to spring a considerable extra expense upon a client incurred by his architect without his knowledge. In order to avoid any difficulty whatever, make the payment of extra work contingent, by the terms of the contract, on the architect's written order, and insist upon this procedure. At the same time, advise your client that he has no power to give any orders except through your agency. It will avoid disputes if you afford both parties to the contract the opportunity to fully study its contents. I have been surprised to find it necessary to ask builders to read through an agreement before signing it. For the architect himself, it is most important that he should be under no obligation whatever to either parties of a contract. He must not only be impartial, but give no occasion to the suspicion of partiality; keep strictly to the terms of the contract, and avoid the law like poison. I will not notice the questions of dilapidation and valuation further than to point out the caution required in dealing with them. If the public is induced to invest its money in any enterprise on the strength of your valuation, and this should turn out to be altogether too visionary, you will have incurred a heavy responsibility. If you are doubtful on the subject, it is better to pay for good advice. There is danger in trying to be a universal specialist. Find good brains, use them, and trust them. Before concluding, there is one more question to consider: That of giving certificates. Always keep good security, and keep well in view the contingency of the builder's failing before completing the contract. If you do not, you will have involved your client in embarrassment. Be very cautious in giving the final certificate. It is the client's acknowledgment, through your agency, that the builder has completed his part of the contract, and it debars him from any further claim. Pitfalls will come as long as it is human to err; but if an architect refrains from compromising his independence, pays attention to details, and never trusts to a verbal or ambiguous agreement, and will not allow himself to be persuaded against his judgment, he will avoid very many of them. It is easy to be wise after an event; to be wise before it is to learn from the experience of others.

A short discussion followed the reading of the paper, in which Messrs. H. O. Cresswell, E. Woodthorpe, Arnold B. Mitchell, F. T. W. Goldsmith, Leonard Stokes (ex-president), A. J. Bolton, C. H. Brodie and the President took part, and a hearty vote of thanks was accorded to Mr. Bidlake.

THE ALBERT GATE BUILDING.

IN the Queen's Bench Division, before Lord Coleridge and Mr. Justice Wright, on Wednesday, the action, Archer and Another *v.* J. W. Hobbs & Co. was heard. This was a dispute, says the *Times*, between the "building owners" and the architects of the enormous building in course of erection at Albert Gate, Hyde Park (nearly opposite Sloane Street), the great dispute being whether, the owners having told their architects that the cost of the building was not to exceed 100,000*l.*, the architects had been guilty of negligence or want of due care and skill in allowing the expense to amount to 200,000*l.*, which had been the actual expenditure. It appeared that the building had been undertaken and begun without specifications and detailed estimates upon "quantities" actually "taken out," and the case is important, because it was laid down again and again by Lord Coleridge, and appears to have been in a great degree the basis of the decision, that if a building owner desires to limit his expenditure on a building he should have detailed specifications and estimates on "quantities taken out," and stipulate expressly that there shall be no expenditure beyond, unless allowed by written orders either of the employer or his architect. In the present case it appeared that the building was to be erected by Hobbs & Co. as a speculation, and that there had been, in March 1887 some general preliminary discussion between the architects and the building owners—Hobbs & Co.—and that the architects had stated generally that a large building of the size and character contemplated might be erected at an expense not exceeding 100,000*l.*—that is, at the rate of 10*d.* per cubic foot of the total cubical area, which, upon such a building as was contemplated, would work out to something like 100,000*l.*, though, it was said, it might possibly cost 115,000*l.*, and the scheme was that the building should be sold for 132,000*l.*, so as to leave a profit to the builders of about 17,000*l.* That discussion was in March 1887, and was only general and hypothetical; but in November 1887 Hobbs & Co. having considered the matter, wrote to the architects that they did not intend to expend more than 100,000*l.* upon the building, which was then intended to be on the site vacant at Albert Gate (the ground-rent of which would be 5,000*l.* a year), and which it was intended should be let out in flats or different suites of apartments on the same or different floors. The work was undertaken and commenced in November 1887 upon a general sketch-plan of the "elevation" and the dimensions of the building upon the site designated, with a certain number of floors, without detailed working plans and specifications and estimates on "quantities" "taken out" in the usual way, the owners having stated their intention that the expense should not exceed 100,000*l.*, and that there should be no extravagance. The architects were to have 4,500*l.* and an additional 1,700*l.* if the building sold for 132,000*l.* The work went on through 1888, 1889, 1890 and 1891, and it is not even yet entirely completed, and the expense has amounted to 200,000*l.* In 1889 the expense incurred was 60,000*l.*, and it could be seen that the

building could never be completed for 100,000*l.*, and in 1890 it was seen that it would cost 160,000*l.*, and in the result it has amounted to 200,000*l.* The architects sued for the sum of 1,000*l.*, the balance of the 4,500*l.* they were to have. The building owners resisted the claim on the ground that the architects had been wanting in care or skill in estimating the expense, or in keeping the expenditure within the 100,000*l.*, and there was a counter-claim for the alleged negligence. The case went to the Official Referee, before whom it was contended, on the part of the defendants, that, though there was no guarantee or warranty that the expense should not exceed 100,000*l.*, the architects had not used due care and skill in confining the expense to that amount. The Referee, however, thought that there was no negligence imputed except in not limiting the expense to 100,000*l.*; that the defendants must have seen before long that the building must cost far more than 100,000*l.*, and that there was nothing in the alleged defence or counter-claim; and he, therefore, found for the plaintiffs, the architects, for the amount they claimed. The defendants, the building owners, appealed.

Mr. William Graham and Mr. Bonner appeared for the defendants in support of their appeal. With reference to the finding of the Referee, that they must have seen that the expense must exceed 100,000*l.* when at the end of 1888 it already came to 60,000*l.*—that might be true; but what were they to do? It was too late to abandon the design, and it would have been a dreadful disaster to have to pull the building down and begin again. The architects were bound to use reasonable care and skill in keeping the expense within the limit fixed by the employer, and surely it was not due care or skill to allow the expense to be doubled. It was clear, however, from the report of the Referee that he had repudiated any such duty or liability, and that was an error in law which vitiated the report. [Lord Coleridge: There were no detailed plans and specifications on which quantities could be taken out and detailed estimates given, and if the employer desires to keep the expense within a certain limit he should have such specifications and estimates, and stipulate that the sum estimated shall not be exceeded without written orders signed by himself or his architect.] The architects themselves made out their own specifications as they went on with the work. The owners could not know what would be the excess of expenditure; the architects were bound to know. [Lord Coleridge: The owners must have known before long that their limit would be exceeded, and they allowed the work to go on, and it was admitted that the work done was well worth what was charged.] That is so; but still, can it be said that the architects performed their duty when they allowed the sum limited to be doubled? Upon that question the Referee has really never decided; indeed, he repudiated any such duty, and said, again and again, that there was no such implied contract—that it ought to be put into a written contract. He treated it rather as a question of warranty or guarantee, not one of negligence or want of due care and skill; and as to that he did not find.

Mr. M'Call, Q.C. (with Mr. Edward Pollock), appeared for the plaintiffs in support of the report of the Official Referee, and argued that in effect he had negatived the alleged negligence.

The Court as to this communicated, during an adjournment, with the Official Referee, and on their return

Lord Coleridge said the Official Referee had told them that he had not formally or expressly found upon that question (apart from any guarantee), and though there could be no doubt what his finding would be, it would be safer to send the case on that point back to him. Case accordingly sent back for the Official Referee expressly to find on that point.

NEW BUILDINGS.

Glasgow.—The orphanage just erected at Whiteinch, in connection with the Glasgow Institution for Orphan and Destitute Girls, has been opened. The new home stands on an acre and a half of ground at the west end of Victoria Park, an excellent site, of which advantage has been taken in planning the building to obtain a south-easterly or south-westerly exposure to all the principal rooms, which thus have almost all pleasant views over the park. On the ground-floor are the living-rooms and other necessary accommodation. The system of small dormitories has been adopted, six in all being provided for the sixty girls. The bedrooms are on the first and attic floors, special provision being made for the senior girls, and there is ample lavatory and bath-room and other conveniences on each floor, while the sick-room on the first floor commands a delightful prospect of the park. Externally the building forms an imposing pile in red stone, with darker red dressings and high-pitched green-slated roofs. The architecture is Scottish Domestic of a simple type. The architect is Mr. S. Henbest Capper, M.A., A.R.I.B.A., of Edinburgh.

Richmond.—The foundation-stone of the new Municipal Buildings has been laid. The buildings, which are to be constructed from the designs of Mr. W. J. Ansell, of Staple Inn, will include a commodious council-chamber overlooking the river, committee-rooms and rooms for the various borough officials. The buildings will be of the Elizabethan Renaissance style, the front faced with red bricks, having terra-cotta or stone strings, cornices, &c., and the roof covered with red tile ridges. The contract cost of the buildings is 13,000*l.*

Tunstall.—Public buildings erected at Tunstall in commemoration of the Queen's Jubilee have been opened. The buildings cover about an acre of ground, are Renaissance in character, and comprise three blocks—the Victoria Institute, fronting Station Road; the public baths and fire-engine station, with a frontage to Bath Street; and the volunteer armoury, town yard, with workmen's dwellings, stables, cart-sheds, &c. The contractors were Messrs. Yorke & T. Goodwin, of Tunstall. Mr. A. R. Wood, architect, Tunstall, designed the buildings.

GENERAL.

Mr. G. O. Reid, A.R.S.A., has been commissioned by the Queen to paint a picture of the baptism of the son of Prince and Princess Henry of Battenberg.

The Annual Exhibition of the Herts Society for the Promotion of Art took place last week.

The Sixth Annual exhibition of the Wolverhampton Society of Artists was opened on Monday in the north room of the Municipal Art Gallery.

Mr. Alma-Tadema, R.A., was, as president, to have attended the meeting of the Wednesbury Institute on Thursday and deliver an address on "Art in its Connection with Industry"; but, in consequence of the illness which kept him away from the inauguration of the Art Gallery in that town, he was not able to fulfil his engagement. His address, however, was forwarded to be read to the members of the Institute.

A Studentship, provided out of the funds of the Newton Testimonial Fund, having been offered to the University of Cambridge by the managing committee of the British School at Athens, the Craven Committee will proceed to make the appointment in the course of the present term. The studentship is of the value of 50*l.*, and is tenable for one year. The holder will be required to reside at Athens for not less than three months during the ensuing winter and spring, and to conform to the rules and regulations of the school.

Mr. T. Locke Worthington will give a course of twelve lectures on "Architecture as Demonstrating the Manners and Customs of Nations," at Hampton Court Palace. The first lecture will be given to-day at 2.30 P.M.

Sir J. Whittaker Ellis, M.P., on Saturday laid the foundation-stone of the Municipal Buildings in Richmond, which are to cost 13,000*l.*

Captain Shaw has been appointed Knight Commander of the Order of the Bath.

Mr. Brunner, M.P., has offered to present to Middlewich a house, with ground adjoining, for the purposes of technical education and recreation.

Professor Flower's Report on the condition of the University Museum, Oxford, has been published.

Mr. F. G. Jackson, of the Birmingham Art School, read a paper on "Art Education in Relation to the Industries" at the meeting of the Birmingham Art Ramblers, of which society the late Mr. Henshaw was an honorary member.

The New River Company have agreed to open the New River Head in Clerkenwell by taking down the obstructive enclosing walls, and substituting a suitable dwarf wall and railings.

The Belgian Government have promised to the town of Ostend the gratuitous cession of the ground necessary for the construction of a new dock, and to grant a subsidy of 3,000,000 francs towards the construction of the new quay.

A Cast of the Model executed by the late Sir J. E. Boehm for his statue of Mr. Charles Darwin has been presented to the Cambridge University by Mr. Darwin's family, and has been temporarily placed in the lecture-room of comparative anatomy.

The Annual Conversazione of the Lancashire and Cheshire Antiquarian Society took place on Wednesday evening. The retrospect of the work done by the Society during the past year was of a highly satisfactory nature.

New Schools have been erected at Wigston, and the most careful attention has been paid to the ventilation, so that it may be as perfect as possible, the extraction of the vitiated air being effected by a number of the direct-acting turret ventilators of the "Climax" Ventilating Company, 15 Great George Street, Westminster.

An Oak Chancel-screen designed by Messrs. Wood & Kendrick, architects, has been placed in the parish church, West Bromwich.

The Architect.

THE WEEK.

THE Rev. COPELAND BOWIE has raised some questions about the tendering for London Board Schools. It appears that in 1884-85 the number of tenders received for a building ranged from nineteen, as in the case of the Trafalgar Square Schools, to twenty-seven for the Upper Kennington Lane School. But for the period 1888-91 the largest number of tenders was eight, while only three were sent in for the Randall Place School. One effect is that a few contractors engross the building. It is found that Messrs. LAWRENCE & SON'S contracts amount to 85,923*l.*; Messrs. BULL & SON'S, 75,983*l.*; Mr. COX, 71,254*l.*; and Mr. LOVATT, 54,188*l.* Mr. COPELAND BOWIE asks whether the system does not create an unfair monopoly, bring in provincial firms to the exclusion of London contractors, and reduce the employment for metropolitan workmen? He ought to have known that the system of unlimited tendering had to be given up on account of the deviations from honesty which masters and workmen pursued. If the Works Committee find that better work is obtainable under limited tendering, in the interests of the ratepayers that system should be followed.

THE *Return from Calvary*, by Mr. H. SCHMALZ, which is to be seen at DOWDESWELL'S Gallery, has little in common with the Italian paintings of Scripture scenes. The troubled sky and the background of Jerusalem, with its crowds of spectacle-seekers, divide the interest, which formerly would be attracted by the figures alone. But on that account the picture has more of a modern air. The VIRGIN is represented as being accompanied to her home by JOHN and MAGDALENE, and as overpowered with emotion. But her companions do not give much heed to her sufferings. JOHN holds her arm, but his gaze is on the distant crosses, and MAGDALENE is occupied with her own grief. JOHN is depicted as a manly person with a dignified head. The best figure of the three is the MAGDALENE, and the light falls on her face in a manner that enhances the beauty of the contour. The face might have been suggested by the fine outline by DA VINCI in the British Museum. The picture tells its story, but the artist has wisely refrained from imitating the dramatic arrangements of other works which have captivated so many people. The quantity of studies from the Holy Land which are to be seen in the gallery suggest how much preliminary labour was gone through. It is creditable to Mr. SCHMALZ, and will enhance his reputation. In another room are several of Mr. THORN WHAITE'S water-colours. The subjects are from Sussex, Essex, &c., and they have all the qualities which we expect in the artist's work. They might be arranged in two classes—one with landscapes as seen under a glowing light, the other under one that is cold and clear. Mr. LOGSDAIL exhibits elsewhere sketches in oils from the Riviera. In them we see colour which must startle eyes which have not gazed on the Southern Paradise. A year of study in the district ought to be enough to make an artist a colourist. Evidently Mr. LOGSDAIL has benefited by what he saw, and his success should tempt many more to go through the same delightful course.

THE paintings and statues commissioned by the Municipality of Paris for the adornment of civic buildings are so numerous and widespread the citizens do not realise all their importance. The Musée at Auteuil will be found the best place to enable strangers to understand the munificence with which art is patronised in the Municipal Council. The Musée has been increased by the addition of one of the large pavilions which formed part of the exhibition buildings of 1889. In one place are sketches of the wall-paintings in the Hôtel de Ville, mairies, Palais de Justice and schools. Illustrations of many of them have appeared in *The Architect*. In another gallery are to be seen the medals and engravings which the Municipal Council commissioned. Then there are sketches of paintings for churches which up to 1870 were ordered, as well as secular works. Tapestry, paintings, &c., which are the property of the city, are found elsewhere, and in one of the largest galleries some of the paintings for the Hôtel de Ville have been deposited until the rooms are ready to receive them. The pavilion of the exhibition is occupied with casts of sculpture purchased or ordered by the Council, some old tapestry forming a fine background for them. How many centuries must elapse before a similar collection is to be seen in London?

IT is impossible to preserve the amenity of any city unless some latitude is allowed to the authorities, for Acts of Parliament are necessarily restricted in their phraseology, and hardly meet all the cases which arise. The Scottish Deans of Guild have been allowed to exercise a discretion which was equitable in interpreting Acts. A recent decision of the Scottish Courts must have the effect of restricting them to a sort of routine. The case arose out of an attempt to build over forecourts. One of the streets in Glasgow was laid out according to the terms of a deed which stipulated that the roadway should be 50 feet wide, that on each side there should be a grass plot of 20 feet between the street and the houses, so that the distance between the houses should be 90 feet. It was desired to utilise one of the plots as a building site. The Master of Works objected on public grounds. The Dean of Guild, as we stated at the time, thereupon refused to grant the authority for the building, because he held that it was the duty of the Master of Works to bring under the cognisance of the Court any deviation from the existing line of the street in all plans of new erections submitted to the Court, and that it was the duty of the Dean of Guild Court to see that a uniform building line was maintained, and that restrictions as to buildings imposed by title-deeds, and still subsisting, were adhered to. The parties appealed to the Court of Session and were successful. The case was sent back to the Dean of Guild Court for the granting of the building permit. Their lordships held it was outside the duty of a Dean of Guild to enforce provisions in contracts, more especially when no objection was made by the superior or the adjoining landlords. Costs were awarded to the appellants.

FEW officials have more responsibilities than sanitary inspectors; fewer still are so grudgingly rewarded for their services. It too often happens that their tenure of office depends upon authorities who have a financial interest in the evils which the sanitary inspector is supposed to extirpate. It is no wonder, therefore, that the inspectors should be desirous to have the conditions of service arranged in a more equitable way. At a meeting of their Association, which was held on Saturday in Manchester, the following suggestions for the administration of sanitary law were approved:—"(1) That the officers now variously named sanitary inspectors and inspectors of nuisances be designated 'sanitary inspectors'; (2) that all sanitary inspectors be elected to a permanent tenure of office and only be dismissible for misconduct or proved incompetence, with right of appeal to the Local Government Board or a central department of health; (3) that candidates for the position of sanitary inspector shall be required to possess a general knowledge of building construction and a qualifying certificate in sanitary science granted after examination by a Government department; (4) that sanitary inspectors shall be required by law to inspect districts for the detection of nuisances and to serve notices for the abatement thereof, all such notices to be as valid, if confirmed by the local authority, as if served by the authority's order; (5) that the duties of sanitary inspectors shall be clearly defined and regulated by law or by a central Government department; (6) that in all appointments requiring an officer's whole time an adequate minimum salary should be prescribed; (7) that a fund be formed for granting superannuation to sanitary inspectors." There is nothing that is likely to cause danger to towns or districts in the proposals of the Association, and as long as the inspectorships are held on a precarious tenure it is not to be expected that the holders will be courageous in running risks. It would also be an advantage if the desire of the Association could be realised, and broken-down schoolmasters, railway porters or men who had failed at other avocations should no longer be pushed into the ranks of the sanitary inspectors, as if the office were created as a refuge for broken-down friends of Councils and Boards.

MEMORIALS OF EDINBURGH.*

WHEN WALTER SCOTT described Edinburgh as his romantic town he employed the most suitable of epithets. The city is not remarkable for great works of architecture, and few would select any of the buildings for imitation. But the streets of the Old Town especially afford as much pleasure as if every house were a masterpiece. Narrow wynds and closes, that are made dark by tall houses, are admired as picturesque, squalor is not shunned, and steep ascents are accepted as a necessary element in the pleasure of enjoying life in so attractive a place. The criticism which is employed in other cities is set aside in Edinburgh, and in the Northern Athens, as in the ancient seat of Greek civilisation, people judge by their memories rather than by their eyes. The inhabitants prize Edinburgh for its associations rather than for its appearance. Let the visitor be seen gazing at any house, and somebody will appear who will relate a history about its inhabitants. Commonplace houses in back streets or lanes appear to have been the abodes of distinguished men or the stages on which memorable scenes were transacted.

The historic and romantic interest that was attached to the buildings rather than their architectural value inspired the preparation of the "Memorials of Edinburgh" about half a century ago. In the preface to the new edition the author explains the origin of the work when he says:—"Buildings which had survived from older centuries and perpetuated associations of the Scottish capital with national history were being rapidly effaced in the progress of civic improvements;" so drawings were made of the houses to form the illustrations of a work in which the associations were to be recorded. For the sake of archæology it will be regretted that Sir DANIEL WILSON's book was not to be the history of the final demolitions. In the course of the half century which has elapsed since he began writing, civic improvements have cleared away many more examples of the habitations of the old worthies of Edinburgh. It must have been with sadness that Sir DANIEL WILSON penned the following list of losses in the city he loved:—

> Since the appearance of the first edition the palace of Mary of Guise; the haunted dwelling of Major Weir; the lodging of Bishop Bothwell, associated with one of the tenderest of old Scottish ballads; Robert Gowlar's historic mansion, alternately abode of nobles, foreign ambassadors and other honoured guests, and place of durance of men of historic note, throughout the sixteenth century; and that of Sir Thomas Hope, no less rich in memories of some of the foremost men of the succeeding age, have all disappeared. The beautiful Collegiate Church of Mary of Gueldres has given place to a railway station; and St. Margaret's Well, with the legendary virtues of St. Triduana's healing fountain, has suffered a like fate. In truth, the intervening years since these "Memorials" first appeared have witnessed a crusade against nearly all that remained of Scott's "own romantic town." On the northern slope of the ridge along which the High Street runs, Cockburn Street has displaced the old closes and wynds between the Cross and the Tron; and Jeffrey Street has still more effectually completed the work of destruction eastward to the Nether Bow. The great fire of 1824 left few traces of elder centuries on the southern slope between St. Giles's and the Tron; but further eastward the destruction of Blackfriars Wynd has effaced a thoroughfare only secondary in picturesque attractions and historic interest to the quaint old West Bow. The reader needs no chronicler to tell him that all are gone. . . . But happily the picturesque beauty of site which gives so unique a character to the Scottish capital is indestructible; and the sacrifice of so much of its inheritance from elder centuries has begot a spirit of reverence along with some sense of the irreparable loss.

It is inevitable that to street improvements much that is old must be sacrificed; but in past days it is to be feared that old buildings were not saved because it was supposed that the materials could be utilised in some other and more improved ways. Just as in Elsinore the funeral baked meats were turned to account for the marriage feast, so in Edinburgh antique masonry served for modern houses. SCOTT, for instance, was as loving an admirer of the city as could be found within the precincts of the Good Town; but, with all his affection, it is plain, from his statement in the "Heart of Midlothian," that he was not above decorating the entrance of his kitchen-court at Abbotsford with the stones which composed the gateway of the Tolbooth with its ponderous fastenings. Melrose Abbey also was raided, in order to obtain sculptured stones for the same house. SCOTT could find many precedents for attaching antique remains to his property. When the Cross of Edinburgh, from the platform of which so many important announcements were made, was taken down by order of the Corporation in the middle of the seventeenth century, Lord SOMERVILLE seized the shaft, with its capital, and set it up on his estate at Drum. Four of the grotesque heads were built into a tower, and afterwards they found their way to the Abbotsford collection. When some houses in the Lawnmarket were taken down, it was found that for the walls fragments of earlier work were employed, "the carved work being built into the wall, and the stones squared on the exposed side." Many other houses would be found to be made up by the exercise of the like thrift. It must have often happened that the saving from the use of old materials was hardly worth reckoning, but there seems to have been a sort of passion for the practice, as if the degradation of the work of vanished craftsmen was evidence of power, success and cuteness. We give one story which is suggestive of the odd ways of the North:—

> Shortly after the altering of the old front [of the Parliament porch], the late Bailie Henderson observed a cart conveying along the South Bridge a load of carved stones, among which the statues of Justice and Mercy formed the most prominent objects. On inquiring of the carter as to their destination, he learned that one of the professors, who kept a Polar bear, had applied to the magistrates for stones to erect a bear's house within the College quadrangle, and he accordingly obtained a gift of these *old rubbish* for the purpose. The bailie gave the carter a fee to turn his horse's head and deposit them at his own villa near Trinity, from whence he sent him back with his cart full of stones equally well adapted for the professor's bear-house.

After such a transaction we need not wonder that some of the most ancient portions of Holyrood were destroyed in 1753 by the hereditary keeper in order that he might have apartments in another part of the palace which he preferred. Relics of the past should, however, be prized in Edinburgh, for without them it would be easy to say that the city has not a very long history. The English invasion in 1544 was disastrous for the early architecture and the Mediæval work that has survived is not of great value. As Sir DANIEL WILSON says, "If we except portions of the castle, the churches, and the north-west wing of Holyrood Palace, scarcely a single building anterior to this date exists in Edinburgh." But few visitors to Edinburgh can believe that the streets are not representative of all periods of architecture, for in no other city is imagination allowed so much license.

The Old Town of Edinburgh, that is, the picturesque part of the city, consists, as all the world knows, of a tortuous but continuous line of streets from the castle on the west to Holyrood on the east. With the exception of Heriot's Hospital, all the buildings that are associated with the history of Edinburgh are on that line or contiguous to it. The main interest surrounds the High Street.

The castle is so well placed on the rocky hill, as BURNS says:—

> Like some bold veteran, grey in arms,
> And mark'd with many a seamy scar,

its appearance affords a kind of pleasure that cannot be enjoyed elsewhere within a city. The buildings which are visible belong to different periods subsequent to 1574. The esplanade is not older than 1753. The castle was used as a palace, and the first meeting of the Scottish Parliament was held in a hall which measures 84 feet by 32 feet. Sir DANIEL WILSON, when examining the buildings for his "Memorials," discovered the ancient oratory or chapel in which St. MARGARET, the queen, placed the Black Rood containing a fragment of the Cross. It is only 15 feet 10 inches in length by 10 feet 4 inches, and evidently was Norman in style. There was also a larger chapel. The Castle Hill being visible from all parts of the city was selected as a place for executions which were intended to strike terror into citizens. Witches especially were burnt there, and on one occasion no less than five suffered, "all of thame confessant thair covenanting with SATAN, sum of thame renunceand thair baptisme, all of thame oft tymes dancing with the DEVELL."

Near the foot of the hill in Castle Hill, the Grassmarket and Lawnmarket, some ancient houses are still to be seen. One house in Blair's Close is supposed to have been the residence of the Duke of GORDON. It would seem as

* *Memorials of Edinburgh in the Olden Time.* By Sir Daniel Wilson, LL.D., F.R.S.E. New Edition. Edinburgh: A. & C. Black.

if the builders often anticipated a time when the houses were to be let out in "flats or dungeons," for, as Sir Daniel Wilson says, "no feature is so calculated to excite the surprise of a stranger, on his first visit to such substantial mansions, as the numerous and ample flights of stone stairs, often placed in immediate juxtaposition yet leading to different parts of the building." In the district was the palace of Mary of Guise, which was finer than most of its neighbours. It was approached by Blyth's Close, "and through this mean and obscure alley ambassadors and statesmen of England and France and the messengers of the Scottish Queen made their way to the presence of the Queen Regent."

It is the opinion of Sir Daniel Wilson that a peculiar kind of doorhead consisting of mouldings rising to a peak in the centre, like a flat ogee arch, which is to be seen in the Lawnmarket and elsewhere in Edinburgh, marks the handiwork of Robert Milne, the seventh royal mason of his family. Nowadays the Lawnmarket does not appear to be an eligible place for men of genius. But Hume, the historian, was a householder in one of the closes, and in Baxter's Close Burns lived on his first visit to Edinburgh, and was glad to have share of a humble room at eighteenpence a week. They were both, it must be said, indifferent to the picturesqueness of the city. This was perhaps excusable in Hume, but Burns was of another sort. His letters contain nothing about the impression which was made on him by the city, and the Address to the city is almost entirely occupied with the inhabitants. The Lawnmarket led to the Parliament House and St. Giles's Cathedral. Adjoining the latter was the Tolbooth which, if no longer existing, cannot be forgotten while the "Heart of Midlothian" is read. Near it were the Lucken booths, which, according to Scott, were jammed into the midst of the street, leaving for passage a narrow way on the north. In contrast with the huge block were several small booths which were established between the buttresses of St. Giles's. The booths, large and small, must have obscured the church, but it appears that Turner was opposed to their removal, for it was the old High Street of Edinburgh which he considered to be equal to the High Street of Oxford. Sir Daniel Wilson must hold a like opinion, for he says:—"We doubt if its broad and unencumbered thoroughfare will ever again meet with the praise that it received from travellers who had to pass through the narrow defile of the *Pursis*, or thread their way along by the still more straitened *Kramts* that clung on to the old church walls. So far as picturesque effect is concerned our city reformers seem to have fancied that every bit of the old church which the Lucken booths concealed was to disclose features as rich as the fine Gothic crown they saw towering over the chimney-tops." The part of the street between the Parliament House and the church was a favourite haunt of the citizens in the eighteenth century, and still a large proportion of the inhabitants will be found in the streets of Edinburgh seemingly unemployed.

St. Giles's Cathedral or collegiate church lost some of its true character by the changes which were necessary in order to make the building adapted to variations of ritual. "Mediævalists and Reformers, Presbyterians and Episcopalians alternately struggled for the mastery, and in turn re-adapted the ancient church to their divers modes of worship." But in 1829 William Burn, the architect, must also be credited with a share in the transformations, which seemed to have for end the removal of all that was characteristic and the substitution of the commonplace. The recent restoration obtains the approval of Sir Daniel Wilson, and the church is now as far as is possible brought back to its original condition.

Elsewhere there are High Streets, but we believe Edinburgh alone has a Canongate. The name suggests ideas with which the street does not correspond. It was never entirely made over to canons or monks. As it leads to Holyrood, it must have been favoured by courtiers, and several of the houses preserve traces of their ancient appearance. Cromwell, on his first visit, resided in the Canongate, and the street is associated with men that were notabilities in Scotland. But plebeians, however able in art, science and literature, were obliged to live elsewhere, unless they were compelled through debt to take up their residence in the part known as the Sanctuary, which was secure against bailiffs. The English Opium-eater was one of the last who found refuge there, and Scott appeared to think that, as chronicler of the Canongate, there would be some fitness if the place preserved him from his creditors.

We should have liked to accompany Sir Daniel Wilson in his peregrinations through other parts of the city as well as to the interesting town of Leith, which, it is to be hoped, may always preserve some of its independence. But the pleasure must be sacrificed to expediency. Edinburgh is one of the most interesting of cities, and it would be hard to find a safer and more earnest guide to "the things of fame" that give it renown than Sir D. Wilson. His book is a series of historical pictures that are full of life, with architectural backgrounds which are worthy of the figures.

THE SOCIETY OF ARCHITECTS.

At the meeting of the Society of Architects held at St. James's Hall, Piccadilly, on Wednesday evening, the president, Mr. W. H. Seth-Smith, F.S.I., delivered his inaugural address as follows:—

On the occasion when, following immemorial custom, you look for some utterance, however brief, from him whom your kind suffrage has called to preside over your affairs, it would be disappointing if I could not preface my remarks with a word of congratulation. It seems to me that your Society is stronger than it was at the commencement of last session. The average quality of the papers read was far better than in any other previous year, the meetings were better attended, while there has been no diminution in numbers applying for membership, and the elections have been well sustained, notwithstanding the vigilant efforts of the Council to exclude all who are not *bonâ-fide* and well-qualified architects. The excursion to Belgium was in every sense a successful enterprise—full of profit to us as architects.

But besides the usual work such a Society as ours performs for the mutual advantage of its own members, the Society of Architects has devoted its energies to the interests of the entire profession and to those of the community at large in promoting the registration movement. This is the great idea inspiring us at the present time, an idea which when realised will, we believe, not merely reform, but give an immense impetus to the art of architecture; and if all other reasons were lacking, this is alone a sufficient one for your existence as a Society, and for the sympathy, support and adhesion of all architects who agree that such a measure is necessary.

It is a happy coincidence that at the very commencement of our session I am able to announce that, after years of animated and occasionally acrimonious discussion, the architects of the great colony of Victoria have agreed that it is necessary in future to prevent any but properly-trained men from styling themselves architects, and have drafted a Bill which, presented—as it is to be—to the Legislative Assembly with the unanimous support of the colonial profession, is, I presume, pretty sure to become law within the next year. By comparing the text of the Bill with the Bill which our own Registration Act committee drew up with so much care, and which is still before the Imperial Parliament, you will notice that its provisions very closely follow those of the English measure.

But this is not in my opinion the greatest encouragement we have received of late. I suppose all architects will admit Professor Aitchison to be a good professional authority on such a subject, as being at once an artist and a man of science. In a recent communication to the Architectural Association, which I regard as the profoundest and most comprehensive statement of our wants the profession has yet received from one man in so few words, Professor Aitchison writes thus:—

"Traditional architecture may be said to have come to an end in England when the staircase at Christ Church, Oxford, was done nearly 300 years ago, and since then the profession has been groping in the dark, not knowing what to do nor what studies to undertake, so all past architecture from Greek times has in turn been tried. This is, perhaps, not surprising if we consider that, at the time of the Renaissance in Italy, architecture fell into the hands of scholars, goldsmiths, painters and sculptors, who did a good deal to render its surface interesting and beautiful by proportion, composition, sculpture and painting, and who meant to make Roman work the foundation of a new style, but, not being constructors, they were without the foundation for improvement in a structural art and could have no sentiment of structural functions. Wren alone was a great constructive genius, and if there had been a long succession of Wrens something might have come out of it. It is only by putting architecture again on a constructive basis that we can hope to succeed. All that architects can do must be done by building, and building consists in putting the materials we have at command in certain positions and giving them certain forms.

The size and shapes of these forms depend on statical considerations. Arithmetic, mathematics and geometry can alone enable us to solve the necessary statical problems; so these elements must be first mastered and then the statical problems themselves must be solved. Next comes the knowledge of the strengths and capabilities of the materials we have to use. Then comes planning. The mere physical necessity must be met in the plan, including provisions for the superstructure. If all this is properly done, we have a complete structure fitted for its material wants, but scarcely an architectural one. This structure raises no emotions; it merely satisfies the intelligence that what was wanted has been done."

Professor Aitchison then proceeds to the decorative side of architecture, tracing in a few masterly sentences the causes of success in the past and the pitfalls to be avoided by students of design. He says:—"All the architect can do after the plan or general scheme is settled is to shape, to mould, and to piece the various parts, and he may call in the sculptor and the painter to enrich important parts with carving and colour . . . what we want is easily said: daring construction, fitness for the purpose both material and mental, and mostly with the necessary dignity, simplicity and grace; but to do this requires extraordinary ability, the hardest study of many dissimilar subjects and ceaseless effort."

We who have had some experience of practice know how weighty and true these words are, and therefore protest against the assumption of the title of architect by any persons who have not devoted years of arduous study to the subject.

These words about the disastrous result of architecture falling into the hands of scholars, goldsmiths, painters and sculptors in the Italian Renaissance period are in curious contrast to the petition sent to the Royal Institute of British Architects last spring from about fifty architects and published in the *Times*, protesting against all examinations, even such as their own body, the Institute, has established, which is designed to be no more than a test of a qualifying education.

Surely the dual nature (scientific and artistic) of architecture constitutes it the most godlike of the arts. Can we imagine that the joy experienced by the Architect of Nature is confined to the beautiful forms and colours with which He has dressed physical creation? And no architect can ever feel the highest delight which his art is capable of affording until he has designed and created on the same eternal principles. These exalted emotions must have been experienced by such men as Wren and Telford among Englishmen, and by others who in the various epochs and under different circumstances have led what Professor Roger Smith has termed "New Departures."

In a paper contributed to the transactions of the recent Congress of Hygiene I have endeavoured to show, I hope with some success, that it is perfectly easy to test in a qualifying degree the taste and designing power (as well as the constructional knowledge) of candidates for our calling: and after an animated discussion the Congress passed the following resolution by a large majority:—

"That this meeting cordially approves of the principle of the statutory examination and registration of architects."

Such a resolution may be taken as indicative of the feeling of the public in our favour, and should be a further stimulus to future effort in this cause.

The rapidity with which this movement has, wherever understood, grown and found favour throughout the profession in Great Britain is surprising—I say where understood with emphasis, for I have met and talked with many architects who were at first bitterly opposed to the idea, but have in no single case failed, after a short conversation, to obtain an admission that the arguments in its favour outweighed the apparent objections, or that they had totally mistaken the principle of the proposed measure: the opposition is not to be wondered at considering how some persons and some sections of the press have gone out of their way to misrepresent our aims and statements.

Let me point out one or two leading misconceptions with regard to registration. I will first meet the objection that any universal qualifying examination will exclude many of the very best artists from practising architectural work, as by the peculiar constitution of the artist-mind they are impatient of acquiring even the little science required to qualify for practice. Well let us, for the sake of argument, assume that such men would not come up to the scientific qualification, and would be prevented by an Act of Parliament from calling themselves "architects;" there is nothing to prevent their adopting a title distinguishing them as devotees of the artistic side only of our work, say "architectural artist" or "artist architects," and in art circles they might secure a good practice, and still more often they would be sought as partners by registered men less gifted with a soul for art, but enjoying a lucrative practice, on account of their constructional and business qualifications; but bear in mind we do not seek to prevent on the one side great artists, or on the other charlatans, from being employed, if the public choose to employ them, to do our proper work: all we aim at is to put a stop to the desecration of the title "architect" by its free use on the brass plates of men who have had no training in so difficult a craft, and one moreover in the practise of which the health and pockets of the public are much at our mercy.

Another point to be kept in the foreground is, that we aim only to secure a qualifying and not a competitive examination. The latter would be as fatal to our art as the former would be beneficial.

Another fallacy must be noticed, namely, that men qualified and practising at the time of the passing of any such Act would have to pass an examination. Such a stipulation would be unjust and impracticable. Every practitioner who can give reasonable evidence that he has enjoyed a *bonâ-fide* architectural practice would be entitled to registration, while the affidavit to be signed by each applicant for registration, affirming under penalty that he has enjoyed a *bonâ-fide* practice, will at the passing of the Act exclude men who have no right to be included in the profession.

Not that much progress in the training of architects is not being made: the past year has been a memorable one in this respect. The Architectural Association, which has always been the best friend of the architectural student, and to which in the past many men now well known and greatly esteemed in the profession have devoted much valuable time, has, true to its genius, just established a comprehensive and methodical course of training both in the lecture-room and studio, and has changed its system of gratuitous teaching for a paid staff. I hope that many members of the Society of Architects will give some practical expression of what cannot but be the universal admiration of the pluck and energy of the Association. It still wants 1,000*l.* to relieve its committee of anxiety as regards the expenses of this the new scheme, and, as practising architects, we can do much for it by encouraging our pupils and assistants to attend the classes.

In the International Congress of Hygiene and Demography this summer, many valuable papers by the best authorities, both home and foreign, were read on subjects in which architecture and sanitary science must ever go hand in hand, and those of us whom circumstances unfortunately prevented from attending the meetings will have derived much profit from the perusal of the press reports.

As individuals, I hope it will be our first aim to assist one another in improving our designing power. I cannot say that to this end I wish more members had joined our Belgium excursion, for a party of forty is quite large enough for practical purposes; but one can scarcely exaggerate the influence for good upon our taste which a tour among such art treasures exercises; we shall carry the inspirations there received to our own districts throughout England.

One conviction has been much impressed on me by that tour, namely, the importance of greater uniformity in style, if we are to make our cities, towns and villages effective architecturally. Bruges, for instance, is so impressive because its style and materials are distinctive and sufficiently uniform. It is neither a museum of architectural styles, like Venice, nor is it monotonous like Brussels or Paris; there is endless variety both of outline and detail without the sacrifice of that essential breadth and harmony indicative of unity of purpose; this is what we must strive to set right among ourselves and advocate upon every possible occasion. We are, as a nation, too cosmopolitan and too eclectic to warrant the expectation of seeing some consistency of feeling prevailing throughout an entire city, but the revival of municipal authority and the creation of the County Council of London gives an opportunity, never before enjoyed, of effecting a great reform by laying down a rule that each newly-made street shall be built in this spirit to the approval of the superintending architect, assisted perhaps by a committee of experts. The happy result such a regulation would have can be judged by a visit to Norfolk Street, Strand, and Brook Street, Grosvenor Square; while we may take Shaftesbury and Northumberland Avenues as instances of the disastrous effect of the absence of a sufficiently stringent regulation in this direction.

With respect to the incorporation proposals, or in other words, an application to the Board of Trade to register our Society as a limited liability company, without the word limited being attached to the title, I have to mention that the Council have received through the Board of Trade copies of statements from the Royal Institute of British Architects and its allied societies in the provinces, as well as from the Architectural Association, begging that our application may be refused.

It is obvious on the face of all these documents that both our object in applying for such a license, and the privileges which it is in the power of the Board of Trade to grant, have been entirely misunderstood, but we are glad of the opportunity these petitions afford us of making certain official statements as to the position, aims and prospects of the Society of Architects, which we hope will for ever put to silence the ignorant and unfounded statements which have been circulated regarding us.

In conclusion, allow me to beg each member to strive to

contribute something to the common stock of information, which the experience of every man must enable him to offer to his society. Many might do this by attending the ordinary meetings and taking part in the discussions.

Gentlemen, I wish you a prosperous, profitable and enjoyable session.

THE SUPPLEMENTARY CHARTER OF THE ROYAL SCOTTISH ACADEMY.

OFFICIAL intimation has been received by Mr. John Smart, R.S.A., clerk to the Charter Revision Committee, that the supplementary charter of the Royal Scottish Academy had received the Queen's signature. The new charter, it is understood, finally passed the Privy Council on September 24 last, and was then sent on to the Scottish Secretary's office for the signature of Her Majesty and the counter signature of Lord Lothian. The new charter alters various provisions in the original charter of 1838, with the view mainly of broadening the basis of the Academy and making its management less exclusive. In the preamble the chief alterations are thus summarised:—That the Academy should be authorised to admit a larger number of Associates than are at present admissible; that the Associates should be authorised to share in the election of Academicians and Associates; that certain powers now vested in the Council of the Academy should be vested in the Assembly of Academicians; and that certain powers now vested in the Assembly of Academicians and in the Council should be vested in the General Assembly of the Academy. As at present, the Academy is to consist of three orders or ranks of members, viz. Academicians (thirty in number), Associates and honorary members; and it is ordained that nothing in the charter shall affect the rights or privileges of present Academicians or Associates.

Non-resident Academicians. — It is enacted regarding Academicians elected subsequently to the date of the charter that in the event of their residing out of Scotland for a period of three years they shall forfeit their right and the right of their widows to participate in the Pension Fund. On the expiry of the three years from the date on which any Academician has ceased to reside in Scotland the Academy shall on the day appointed for the election of Academicians supply his place, "so that there may again be thirty Academicians resident and settled in Scotland to secure the proper working and government of the Academy." Such non-resident Academicians, however, retain the right to the title, and to use the words R.S.A. after their names; and if they should return to Scotland within ten years, they are to be re-elected to the participating list on the first vacancy.

Associates.—As respects Associates, twenty only of that rank, in the order of seniority, shall be entitled from time to time to participate in the Pension Fund, so that twenty Associates only shall be entitled to participate, for themselves or their widows, at any one time; but on the number of Associates participating or entitled to participate in the fund becoming fewer than twenty, then any non-participating Associates shall become entitled, in the order of seniority, to participate in the fund. The same provision as to absenteeism in Academicians is also made applicable to Associates.

Government of the Academy.—The government and administration of the affairs of the Academy are to be vested henceforth in general assemblies of the Academy (consisting of the Academicians and Associates), in assemblies of the Academicians and in a council. There shall also be appointed annually, as at present, a president, a secretary, a treasurer, a librarian and two auditors, who shall all be of the rank of Academicians. The mode of electing Academicians shall now be as follows:—At the stated assembly of Academicians, held on the second Wednesday of January in each year, each Academician is entitled to nominate for election as an Academician an Associate or Associates. The list of such nominees shall within seven days thereafter be sent to each Academician and Associate, and the election will be proceeded with at the general assembly on Wednesday, February 2. In regard to the election of Associates, the election will proceed after nomination, and not by application as at present. The Academicians at the stated assembly to be held on the first Wednesday of March in each year shall determine the number, if any, of artists who may be elected to Associate rank in that year. Then at the general assembly of the Academy, to be held on the third Wednesday of March, each Academician and Associate may nominate one or more artists for Associate rank from among those who have exhibited in an annual exhibition of the Academy. Then, fourteen days after this meeting, another general assembly shall be held, at which the election of Associates up to the number previously determined by the assembly of Academicians at the meeting on the first Wednesday in March shall take place. [In regard to the election of an Associate, which should have taken place on the 11th of this month, in room of the late Mr. Keeley Halswelle, that will now be superseded by the new rule already quoted. The next election of Associates will take place under the new charter next March.]

Pensions and other Funds.—It is ordained that the interest of the accumulated funds of the Academy, amounting to 22,512*l.*, shall be applied hereafter in payment of such pensions as the Academy may from time to time appoint, and that the interest of a separate sum of 3,409*l.* shall be devoted in payment of pensions so long as they shall deem it proper to do so. It is directed that all other available funds of the Academy, after payment of all the annual charges and expenses, shall be applied for the promotion and encouragement of the Fine Arts, and for instruction and advancement of students therein, and for increased efficiency of the schools of the Academy, or in lectures on painting, sculpture and architecture, and for salaries to teachers and others and prizes or other awards of distinction to deserving students, or in aiding such deserving students in the prosecution of their studies, or in granting aid in cases of necessity to Academicians, Associates and other artists, or to their widows or others dependent on them, and, so far as may be deemed fit, in the purchase or erection of requisite buildings, as hereinafter provided, or in the purchase of paintings, sculptures, engravings, models or other works of art, or of suitable books for the library or in such other manner as the Academy, in its assembly of Academicians, may from time to time direct as being most suitable for these purposes, until they shall be efficiently carried out, and the remainder of the annual income shall be applied in such other manner for the purposes of the Academy as the assembly of Academicians may from time to time direct.

The Annual Exhibition.—It is stipulated that there shall be an annual exhibition of paintings, sculptures and designs held in Edinburgh, in which "all artists of distinguished merit, wherever they may be resident, may be permitted to exhibit." It is to be opened in the month of February, or such other month as may be arranged, and is to continue open for at least six weeks. "Any member," the charter goes on to say, "who shall fail to contribute of his work to the annual exhibition for two consecutive years shall forfeit all claims upon the Academy or its funds unless he shall furnish, through the Council, satisfactory proof to an assembly of Academicians that the failure was occasioned by illness or other cause which such assembly shall consider a reasonable excuse."

Schools of the Academy.—The schools of the Academy, it is declared, shall be maintained and carried on in accordance with the charter and rules; and in the event of its being considered advisable that the Academy should acquire, either by purchase or on lease, or by the erection of the same, premises suitable for their schools or for any other purpose of the Academy, it is appointed that in such a case a portion of the annual income or of the general funds may be applied for such purposes, and, if necessary, that money may be borrowed therefor, or for any other purposes of the Academy, provided that a resolution to that effect is agreed upon by a majority of not less than two-thirds of the members present at an assembly of Academicians specially called, and confirmed by a similar majority at a second meeting of Academicians to be held within a month afterwards.

In certain rules made under the new charter it is laid down that Associates are to participate with Academicians in the election of the hanging committee of the exhibition, which, however, is to consist of Academicians only; and that in the case of architects they may be nominated as Associates, although they have not previously exhibited at exhibitions of the Academy.

TESSERÆ.

The Arts as Factors in Civilisation.

THE fine arts may be reckoned up in the following order—architecture, sculpture, painting, decoration and design, dancing and bodily demeanour, dramatic representations, music, song, eloquence, poetry, refined speech and demeanour. They may produce the different effects of sublimity, beauty, the picturesque and the ludicrous, and there is associated with these admiration of skill and the pleasure resulting from the imitation of an original by a totally different medium. Beauty must, however, be the prevailing character of art, even when it is not the primary intention: fine harmonies of combination being essential in constituting any great production, and harmony and like-unlikeness wherever occurring are beautiful. Science has only one line of real progress. Art, on the other hand, can progress in many different lines, so as to be open to discussion and control by criticism. *Laissez-faire* does not apply to it. It has not unfrequently disturbed the moral order of society, and run many an individual career to wreck. For example, poetry, whether in the ancient epic and drama, or in the modern romance, or in the thousand ways that it has beautified and bodied forth nature and life, has always taken the start of experience and sober reason in forming men's ideas of the

world; and being so often untrue, it has been the means of causing many bitter disappointments and unavailing regrets. Among the different ways, therefore, in which poetry ought to improve, is that of being truer to fact, discarding such fictions as the happiness of childhood, rural innocence, virtue its own reward, as well as purging out the super-sentimental, the horrible, the obscene, the vulgar and the obsolete. The arts are sometimes at a stand, as when the life of a people has little æsthetic physiognomy, and when subjects can only be got from the past. Our own age wants romantic and enthusiastic fervours, but has nevertheless much that the artist can use. The absence of community of powerful sentiment is the death of song, but the life of the prose poem or novel. Perhaps the most barren region at the present time is the drama. Our mechanical improvements have done a vast deal for art, especially for the diffusion of pictures and designs, as well as in the fabrication of musical instruments. It is pleasant to reflect how humanity has advanced in the practice of removing out of habitual sight and contact the directly offensive, and substituting everywhere, along with the convenient and the useful, the beautiful and impressive in art; and how to a great extent we can now enrich the stream of life with emotions of every variety without sacrificing its pressing objects.

Churches of the Chichester District.

The lover of church architecture who takes it in hand to make the tour of the neighbourhood of Chichester can scarcely be said to be repaid by any great degree of beauty or variety in the churches within easy reach of that city. He runs some risk of being wearied with the eternal recurrence of the simple and somewhat prim First-Pointed type-mould, in which the village church of these parts is almost invariably cast. Lancet windows—faultless, it is true—well-pointed, well-proportioned, well-splayed, deeply set, boldly architraved, but a world too numerous, regular and unvarying, except where beautifully and richly relieved, as at Appledram and All Saints, Chichester and Bosham, with the "dark brilliance" of polished shafts of Purbeck or Petworth; spires somewhat of the shortest and dingiest; aisles but seldom, and those but narrow and penthouse-like, as at Donnington and the Lavants: these are the features which are repeated with little variation in all directions. And one great want will press itself on his attention, viz. the almost total absence of Middle-Pointed specimens of architecture. In vain will he look for the easy flow of tracery, the light and shadow of the bold and well-contrasted moulding, the sharp triangular canopy, keenly cutting through and by contrast setting off the exquisitely-enriched ogee projecting from it, the faultlessly-proportioned chancel, or chantry or porch, and all those other features of the perfect Gothic which are to the genuine ecclesiologist a feast and an enchantment, to the thoughtful symbolist "counsels of perfection." And he will naturally ask how it was that the golden age of sacred architecture never visited these parts, never laid upon these churches that plastic finger of which it may truly be said, "nihil tetigit quod non ornavit"? a question more easily asked than answered. It is not meant to be asserted that there is positively not a trace of the work of this period in the neighbourhood, some honourable though peculiar exceptions being recognised as they deserve; but the state of things generally is such as has been described.

The Parthenon.

Parthenon means the apartment or room of a young unmarried woman. The Parthenônes were those rooms of a Greek house occupied by the young ladies of the family. Each such room was a parthenon. The term is never used in the singular to designate the *suite* of rooms occupied by young women. A parthenon, therefore, was always a portion of a house, never a whole house. To have called any whole building a parthenon would have been exactly equivalent to calling a whole palace a boudoir. We should expect, therefore, to find that the term Parthenon designated, not the whole of the Temple of Athênâ, but only a portion of it—the more retired and private portion. And this we really find was the case. In the numerous more or less fragmentary inventories of the sacred stores of the temple that have come to light, the term Parthenon, though occurring frequently, is never once employed to mean the whole temple. These inventories divide the temple into three parts, naming them in this order—Parthenon, Hekatompedos, Pronaos. It seems as if there ought not to be much difficulty in identifying these divisions. What the Pronaos is is perfectly clear. The Hekatompedos, or Hekatompedosneos (temple of a hundred feet), as it was frequently called, can be nothing but the main part of the building, the temple proper. Nothing, therefore, remains for the Parthenon but the chamber immediately behind the temple proper, or else the posticum. This perfectly plain and simple deduction would, without doubt, have been made and accepted by every student of the Parthenon, but for a childish assumption made unconsciously, viz. that the Parthenos must have stood in the Parthenon. A direct conclusion from this, of course, was that, since the Parthenos must have stood in the temple or main part of the building; this, or at least part of it, must have been the Parthenon. This result has introduced inextricable confusion into the whole question, and, indeed, is at variance with the most obvious facts. The Hekatompedos was a hundred feet long, and that is just the length of the entire neos, or temple. Hence there was no room for the Parthenon there, unless it was a part of the Hekatompedos. And this, indeed, nearly all the archæologists at present assume. But this is plainly at variance with the fact that in the inventories the Parthenon is as plainly distinguished from the Hekatompedos as the Pronaos is, and is always mentioned before both. In enumerating the works of art, say the tombs, in St. Peter's, no one would think of making two such divisions as—1, choir; 2, interior of basilica. It is, therefore, pure folly to imagine that the Parthenon was part of the Hekatompedos. Moreover, the only ground that existed for such a supposition has recently been removed by Dr. Köhler, who has shown, from inscriptional evidence, that the Parthenos stood in the Hekatompedos, and not in the Parthenon at all.

German Sculpture.

The German artists do not, generally, follow the ancient traditions with the same persistence as some other schools. With a fine sense of the value of good form they carry an independence of feeling into their design which preserves their art from the reproach of servility. It shows an endeavour to take what may be called a middle course between the ideal or classical and the extreme realistic. It is a means of connecting art with modern feelings and associations without necessarily vulgarising it, as the ultra advocates for the natural style are apt to do; and where it can be done without altogether sacrificing the principle that beauty should be an element of fine art, it has the force of common sense to excuse and even to recommend it. The patriotism and love of fatherland of the Teutonic nations leads them to employ art largely in subjects of national interest, and they strongly feel the importance of representing historical events in a form consistent with the national idea. In doing this, there must always be the antagonism, to which allusion often is made, between the finest sculpture and its requirements, and art that is to be made consistent with modern associations. There is one obvious advantage in making the examples of the best schools of art the groundwork of instruction in design, and that is the influence they exercise in various branches of industry in which good form may enter. It educates the mind and taste and teaches the value of beauty. This is very noticeable in the instance of France, and it is gratifying in examining the various productions of other countries—at Berlin and Dresden especially—to observe the marked effect of these studies in the elegance of some of the designs and the beauty occasionally seen in details.

The Bourbons and Archæological Remains.

It would have naturally been thought that the Restoration would have made it a special care to restore and preserve the monuments of the past, but it is a remarkable fact that this epoch was the commencement of a system of almost limitless destruction of the edifices which the Revolution had spared, and that the change of dynasty in 1830 has certainly been productive of benefit in this respect at least. In the time of Napoleon the Minister of the Interior, by his circular of June 4, 1810, proposed a long series of interrogatories to all the prefects relative to the actual condition of the old castles and abbeys in their respective Departments. These documents are replete with curious and interesting facts. Under the Restoration M. Simeon, when Minister of the Interior, adopted a similar measure, but it does not appear that any practical results were obtained. The lamentable system of indifference which prevailed on this subject up to 1830 may be inferred from the terms of that ordinance which can never be sufficiently regretted, by which the splendid depôt of historical monuments formed at the Petits Augustins was destroyed and dispersed under the pretext of making restitution to owners who no longer survived, or who did not know what use to make of the objects so restored to them. It is believed that not one of the monuments given back to individual owners has been preserved; and, notwithstanding the notorious difficulty of disposing of these splendid relics, a steady refusal was constantly returned to the reiterated requests of M. Lenoir, the founder of this unique museum, to re-establish his collection with what remained after restitution had been made to every known proprietor. This contempt for and unpardonable neglect of antiquity in a Government whose chief claim to respect was derived from the principle of antiquity extended even to the Conservatoire de Musique; the curious collection of ancient instruments of music which had been formed there was ordered to be dispersed or sold at a low price. This ruinous system, which prevailed in Paris, was practised on a still more extensive scale in the provinces. It would scarcely be believed that, under a moral and religious government, the Corporation of Angers, which had for its chief a deputy of the extremest ultra-loyal opinions, should have been allowed to convert the Gothic church of St. Peter into a theatre.

It is still more incredible, but not the less true, that the church of St. Cesaire at Arles, which the most erudite antiquaries looked upon as one of the oldest in France, was transformed *en mauvais lieu*, without any public functionary protesting against such profanation. Who would think that no effort was made, when the Most Christian King returned to the throne of his fathers, to rescue the magnificent papal palace at Avignon from its military desecration? And who could credit the fact that at Clairvaux, in that celebrated sanctuary which was directly connected with the authority of the State, the exquisite church, so beautiful in its proportions and so complete in its grandeur, which dated from the twelfth century, and was said to equal Notre Dame at Paris in size, which was begun by St. Bernard, where so many queens, princes and pious generations of monks were entombed, and where the heart of Isabella, the daughter of St. Louis, was deposited, that this edifice, which had survived the havoc of the Revolution and the indifference of the Empire, should have been demolished in the very first year of the Bourbon restoration? It was then razed to the ground, with all its projecting chapels, without leaving one stone upon another, or even sparing St. Bernard's tomb, to make room for a square surrounded by trees in the centre of the prison which occupied the site of the venerable monastery. Before leaving Clairvaux, we may as well mention that a prefect of the department of Aube, under the Restoration, actually sold seven hundred pounds weight of the archives of this famous religious house, and which were removed to Troyes; and the Count de Montalembert stated that, when he was at that place, he walked over a heap of parchments strewed thickly on the floor, from which he picked up a bull of Pope Urban IV., the son of a shoemaker of that very city of Troyes, and probably one of its most illustrious children. The same prefect demolished the relics of the palace of the ancient counts of Champagne, of the noble and poetic dynasty of the Thiebauds and Henri-le-Large, because they were in the line of a crescent which his architectural genius had unfortunately devised. The beautiful gate of St. Jacques (constructed in the time of Francis I.) and that of Beffroy suffered the same fate. Another prefect of the Restoration, in the department of Eure and Loire, had no scruple in appropriating to his own use several painted windows of the cathedral of Chartres to decorate the private chapel of his country mansion. It has been incontrovertibly proved that during the fifteen years of the Restoration more irremediable devastations were committed in France than in the period from 1789 to 1813. This destruction was certainly not enjoined by the Government, but it was done under its eyes, with its tolerance, and without exciting the slightest marks of its solicitude.

Sanctuary at Hexham.

St. Wilfrid obtained the right of sanctuary for Hexham; its limits were marked out by crosses. That on the south exists no longer even in tradition; that on the west has left its name to the Maiden Cross Fields; the eastern cross is perfect, and stands in the White Cross Fields; the northern one is mutilated, but still graces the Cross Bank. Richard of Hexham says that the penalty for violating sanctuary within the crosses, but without the town, was two hundreds (16*l.*); within the town, 32*l.*; within the monastery, 48*l.*; within the church, 96*l.*; within the choir, 140*l.*; "but if any one, possessed of the devil, violated the fried-stool, or the altar, he was Botolos, *i.e.* beyond the reach of pardon." This stool is a plain First-Pointed stone stall, with sloping sides, like the Glastonbury chair.

Government Maps.

In all the countries of Europe the necessity has been recognised of having a detailed and accurate map, which should be available for military and administrative purposes. The scales on which these surveys have been published have varied from about 3 inches to a mile to about three miles to an inch. First in point of scale comes Hesse, the map of which is published on a scale of 1 in 25,000 or about 3 inches to a mile. Belgium comes next, 1 in 40,000; then Baden, Bavaria, Sardinia, Holland, Wurtemberg, Oldenburg, Grand Duchy of Hesse, 1 in 50,000; Saxony, 1 in 57,600; Great Britain, 1 in 63,360 (afterwards increased to 1 in 10,560, and again to 1 in 2,500); Denmark, France and part of Prussia, 1 in 80,000; Lombardy, Venetia, States of the Church, Tuscany, Parma, Placentia, Guastilla, 1 in 86,400; Hanover, Portugal, Prussia, Sweden, Switzerland, 1 in 100,000; Schleswig-Holstein, 1 in 120,000; Russia in Europe, 1 in 126,000; Austria, 1 in 144,000; Norway and Greece, 1 in 200,000. These surveys have been mostly executed within the present century, and many of them are still incomplete. The survey of Great Britain commenced by the measurement of a base-line on Hounslow Heath in 1784. The last country in Europe (excepting Turkey) to recognise the necessity of a Government survey was Spain. All these Government surveys have been based on triangulations, conducted, for the most part, on the most elaborate and scientific principles. The ingenuity of mechanicians has been exhausted in planning instruments that shall measure base-lines to the fraction of an inch. Instruments for celestia observations and for measuring angles have been devised by the best astronomers and opticians of the day, and the result has been a marvellous accuracy, of which an idea may be formed from the fact that in the English survey the difference between the length of a base-line seven miles long in the north of Ireland obtained by actual measurement, and that which resulted from triangulation starting from a base in the south of England and carried over the whole of England and Ireland, was only 5 inches. The triangulation of the different countries has been connected together. The last link in the chain was completed in 1861–62 by the connection of the Belgian and English surveys across the north of France and the British Channel. This was effected by simultaneous but independent observations carried on by the French and English engineers.

Filigree Ornaments.

Filigree-work that is still an industry at Genoa and Malta is as much at home in Norway and the rest of Scandinavia as it is in the hands of the artisans of India, and it survives in all nearly unchanged from what it was in the days when Greek, Etruscan, nay, Phœnician goldsmiths were busy in producing filigree on the shores of the Mediterranean. It is said that even that delicate and most sensitive instrument of touch, the hand of the Hindoo, is not sufficiently sensitive for fashioning the finest sorts of Indian filigree, and that children alone are employed in the manipulation of such a spider-web of wire. It is to be remarked of this elegant and primitive, perhaps very earliest, form of ornament in precious metal that it had probably reached its limits for delicacy and design at a very archaic period, and has made no real progress in recent times; that, in fact, the early Greek filigrainer worked with as much facility and delicacy as the Hindoo artisan of our day, who inherits the skill and the methods he uses by the direct descent of an immemorial tradition. But there are other forms of the goldsmith's art scarcely less venerable than that of the filigrainer possessed of great native beauty, and which also have survived in India, through the long roll of centuries, as the Zend or Sanscrit languages have survived there, the inheritance of families or clans. These forms of art are perishing. One by one, as the family in whom it may have been handed down becomes extinct or lets the thread be broken, each of these hereditary industries of India moves on with time to its extinction.

Timber in Damp Places.

The surface of all timber exposed to alternations of wetness and dryness gradually wastes away, becoming dark-coloured or black. This is really a slow combustion, but is commonly called wet rot, or simply rot. Other conditions being the same, the most dense and resinous woods longest resist decomposition. Hence the superior durability of the heart-wood—in which the pores have been partly filled with lignine—over the open sap-wood, and of dense oak and lignum-vitæ over light poplar and willow. Hence, too, the longer preservation of the pitch-pine and resinous "jarrah" of the East as compared with non-resinous beech and ash. Density and resinousness excludes water, therefore preservatives should increase those qualities in the timber. Fixed oils fill up the pores and increase the density. Staves from oil barrels and timber from whaling ships are very durable. The essential oils resinify, and furnish an impermeable coating. But pitch or dead oil possesses advantages over all known substances for the protection of wood against changes of humidity. According to Professor Letheby, dead oil, 1st, coagulates albuminous substances; 2nd, absorbs and appropriates the oxygen in the pores, and so protects from eremacausis; 3rd, resinifies in the pores of the wood, and thus shuts out both air and moisture; and, 4th, acts as a poison to lower forms of animal and vegetable life, and so protects the wood from all parasites. All these properties specially fit it for impregnating timber exposed to alternations of wet and dry states—as, indeed, some of them do—for situations damp and situations constantly wet. Dead oil is distilled from coal-tar, of which it constitutes about ·30, and boils between 390 and 470 degrees Fahr. Its antiseptic quality resides in the creosote it contains. One of the components of the latter, carbolic acid (phenic acid, phenol) C^{12} H^{6} O^{2}, the most powerful antiseptic known, is able at once to arrest the decay of every kind of organic matter. Professor Letheby estimates this acid at ½ to 6 per cent. of the oil. Chrysilic acid C^{14} H^{8} O^{2}, the homologue of carbolic acid and the other component of creosote, is not known to possess preservative properties. While an external application of coal-tar promotes the preservation of dry timber, nothing can more rapidly hasten decay than such a coating upon the surface of green wood. But this mistake is often made, and dry rot, instead of wet rot, does the work of destruction. Carbonising the surface also increases the durability of dry, but promotes the decay of wet, timber. Farmers very often resort to one of the latter methods for the preservation of their fence-posts. Unless they discriminate between green and seasoned timber these operations will prove injurious.

NOTES AND COMMENTS.

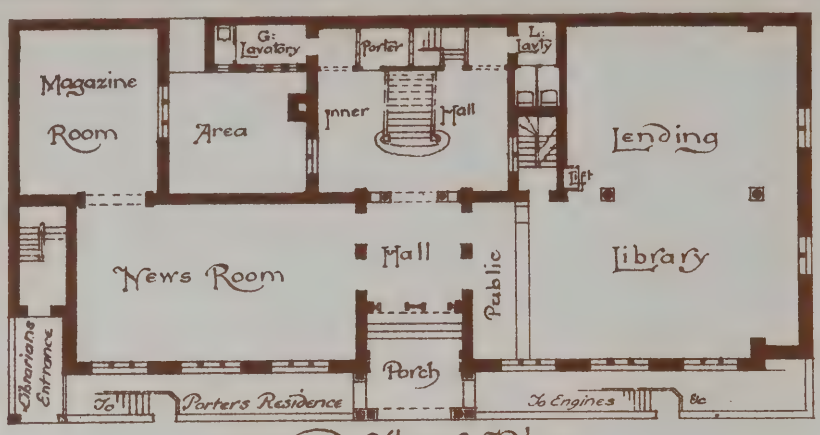
As military service has to be undergone by most of the civilians in France it might be supposed that rigid notions of discipline and loyalty to appointed authorities should prevail throughout the land. In all things relating to art there is, however, an independence which is not to be restrained by any authority that is now to be found. A remarkable case which exemplifies the weakness of authority is troubling the Government, and unless judgment is exercised may lead to the injury, if not to the irreparable decline, of the Gobelins factory. It is not long since M. GALLAND, who is one of the few great masters of the art of decoration, was appointed to be director of the establishment. He was well fitted for the office, and it was supposed that his suggestions would be acted upon readily. But M. GALLAND has discovered that artists resent his interference. Commissions for big pictures to be executed in tapestry are given freely by the Government. Any sort of subject seems of late to be considered as suitable, and therefore it is not necessary for the artists who are favoured to have made a study of decoration. The old canons of art are set aside, and whatever can be presented in colours on canvas is supposed to be able to be reproduced by means of a variety of threads. The advice of an artist of the standing of M. GALLAND, if followed, would prevent many fiascos that now seem to be inevitable, and there would be a chance for the survival of some at least of the traditions of the Gobelins factory. But partly owing to the licence which now finds approval in art, and partly to the contempt for officials in general, M. GALLAND'S counsels have been ignored, and therefore he has sent in his resignation. There was no other course open to a man whose sense of dignity would not allow him to be a salaried nonentity like some other heads of departments. At the same time, what human power can be discovered that is strong enough to make French artists submit to discipline?

THE architects of Rome have imitated their brethren in other parts of the world by forming a society, which will, however, have nothing in common with a trades union. The art of architecture is placed above selfish interests. The first aim of the society will be the more earnest study of the buildings in Rome and Italy which possess historic or artistic interest. It is also intended to have exhibitions of drawings of executed works, and of projects for building. Conferences will be held from time to time for the discussion of subjects relating to æsthetics, archæology and the history of art. Competitions for designs for architecture and the allied arts will also be opened. Some of the members are to form a vigilance committee for the protection of ancient works in Rome and the neighbouring districts. The subscription will be about 1*l.* 10*s.* a year. Amateurs are eligible for admission to the society.

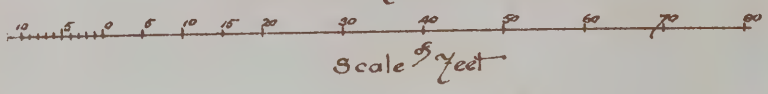
AMERICAN legislators are not yet educated to the degree which is necessary for making a law which will prescribe the possession of a diploma as indispensable for practice, and their ignorance will not soon be dispelled if architects are to be the teachers. When, for instance, a Congressman reads an account of the Convention of Architects which was held a few weeks ago in Chicago, and discovers that the issue of diplomas is not considered to be salutary for the finances of the American Institute, as the members would not be eager to pay subscriptions if they once got hold of those precious documents, he is not likely to be in a hurry to pass Registration Bills. His native shrewdness will reveal to him that what is sought is the upholding of a society, and not the benefit of the community. Private interests are sought to be advanced by making them appear as national questions. The efforts to pass the Bills are, however, to be regretted, for they reveal wasted hours. Mr. CARLIN, of Buffalo, narrated before the Convention the history of three of his attempts to enrich American institutions with a State Board of Architects. He said:—"This Bill was introduced in the early part of the session by a member of one of the districts in Buffalo, and was referred to the Committee on Laws and Legislation. They gave us a hearing, and we went, four of us I think, before the Committee, and we succeeded in getting—an almost unheard-of thing—in getting the Bill reported favourably out of the Committee on the first session. The Committee at the session at which we had the hearing reported the Bill favourably. And there is an unexplained reason why that Bill never turned up. It was finally called out and a vote taken, but the ayes and nays were never called on it, and it was killed in the Assembly, apparently through a lack of interest or for some reason. There was an effort made, which I am sorry to say failed, to get the National Association of Builders, in session in New York in February, to formally endorse the Bill and pray the Legislature of the State for its passage. But the builders took a very conservative view of it, and said that the architects never did anything for them, and they didn't feel like doing anything to help them out; and the resolution which was offered endorsing the Bill and asking the Legislature to assist in its passage was lost. We covered that fact up as far as possible, and did not make any great parade of it. Still, I do not think it had any adverse effect on the passage of the Bill." Now, if the builders were sufferers through the alleged incompetency of vast numbers of men calling themselves architects, would they have shown so much indifference when they saw the architects prostrated before them? It may be said that they gain by incompetency, but it should be also borne in mind that in America builders have risks when there are defective designs, and their interests are therefore bound up with the education of architects. But, like the Congressmen, they know that proficiency in construction is not to be obtained through cramming for examination and the payment of fifteen dollars for a license. Besides, the builders could read the acknowledgment of the promoters "that it is impossible to compel every man to employ an architect to design a building, that he could design it for himself, or employ any person whom he saw fit to design it for him, if he did so with the full knowledge that the person so employed did not claim or profess to be a regular recognised practising architect."

HOT-AIR baths are not as modern in England and Ireland as is commonly supposed. The lines which HERRICK addressed to PEMBERTON suggest that in the seventeenth century "a sweating closet" was not unknown in English houses. In Ireland baths of the kind were used long before URQUHART persuaded Dr. BARTER to introduce a Turkish institution. Lately one was discovered in the island of Rathlin, which, schoolboys know, appears on the map as the most northern part of Ireland. This Tyfalluis, or sweating-house, has been in use from a time that is beyond the memory of the oldest islanders. The bather sat on a stool which was placed on a stove, the place being first heated by peat turf. Unlike modern baths, the heat could be regulated at will, for there was an aperture at the top covered with a flag which could be moved aside. Besides, the dry masonry of Ireland obviates stuffiness. The doorway was about 3 feet in height. Remains of two additional baths are to be found on the island. They were used especially after operations in the bogs or handling flax. Although the baths were small, four bathers could be accommodated in each of them. Another sort of bath employed in Ireland was formed by digging a hole in a field; the patient descended and the clay was packed round him, his head remaining free above the surface of the ground. This was a favourite remedy with the father of HUGH O'NEIL, the last of the Ulster chiefs. Other people preferred to be fixed in a hole in the sand on the sea-shore, and afterwards a reaction was obtained by swimming in the sea.

IT was proposed a couple of years ago to hold an exhibition in connection with the French Union Centrale des Arts Décoratifs, which would exemplify applications of plant form in the art of the past as of the present. The idea was, however, so important it was afterwards decided that it would be a fitting one with which to inaugurate the galleries of the new museum, or to celebrate the opening of the building by such an exhibition in a different place. On the assumption that the French Senate will compensate for the delays of M. ANTONIN PROUST and his allies, it is now said that the exhibition, which will illustrate the employment of plant forms, can be arranged for 1894. As a stop-gap, it is intended to hold an exhibition of the "Arts de la Femme," from August to November in 1892, and it will be both retrospective and international.



Ground Floor Plan



DESIGN FOR L

By

Law: 13th 1891.



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OR A COUNTY TOWN.

RD, A.R.I.B.A



The Architect, Nov. 13th 1891.



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S. FEDE, COMO.

From a Drawing by GERALD C. HORSLEY.



BISHOP'S THRONE: S. MARIA IN TRASTEVERE, ROME.

From a Drawing by GERALD C. HORSLEY.



WILKINSON. DEL.

Printed by Sprague & Co. 4 & 5 East Harding Street Fetter Lane E.C.

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 435.—ST. FEDE, COMO. [G. C. HORSLEY.]

NO. 436.—BISHOP'S THRONE, ST. MARIA IN TRASTEVERE, ROME. [G. C. HORSLEY.]

DESIGN FOR A LIBRARY.

THE design illustrated was submitted in competition for the Architectural Association Medal, and was drawn up in accordance with certain requirements. The ground and first floors constituted the main part of the library, the top floor furnishing accommodation for the librarian and the basement for the porter. Each floor contained a book-store, and the whole four floors were connected by a separate stair for the library officials and attendants. There were also separate entrances and staircases for the residences. The external walls were intended for stone or terra-cotta, the roof for permanent green slates, the railing of wrought-iron, and the base of piers at entrance were to be granite. The drawing from which the plate was taken was exhibited this year in the Royal Academy.

CHURCH OF ST. MARY THE VIRGIN, EAST GRINSTEAD.

THIS church, which is being built in sections, is to be of brick, with red facings externally and internally, the nave arcading, internal lining of chancel, window and door dressings being of local stone from the Honeywell quarries. The church, when completed, is intended to seat 500. The first contract, which is now being carried out by Mr. F. STEVENS, contractor, of East Grinstead (the cost of which is being entirely defrayed by the family of the late Mrs. STENNING, of East Grinstead), includes chancel, vestries and one bay of nave. This will necessitate a wooden building to accommodate the worshippers until such time that sufficient funds may enable the building to be completed. In the chancel, which will simply be divided from the nave by a low dwarf wall and wrought-iron screen, there is a very prettily-designed sedilia and piscina. All the woodwork in doors, choir-stalls and screens will be of wainscot oak, the floor throughout being wood-blocks. The lighting is being carried out by Messrs. JONES & WILLIS. The architect, Mr. W. T. LOWDELL, of 19 John Street, Bedford Row, London, estimates the total cost of the building to be about 5,000*l.*

THE PRIORY, CARTMEL.

COPYRIGHT IN PICTURES.

A CASE of great importance to painters and owners of pictures came before Lord Coleridge and Mr. Justice Wright on Monday. In it the question was raised whether, under the Copyright Act, 1862, there is an appeal from an order of a judge that an entry of copyright in a picture or other work of art shall be struck out or erased. The question had arisen under the following circumstances:—According to his affidavit Mr. Herbert Schmalz, the artist, was the author of a painting entitled *The Young Duchess*, which was exhibited at the Royal Academy in 1890. He sold the original painting to a private purchaser, the copyright in the picture being expressly reserved to him. In October 1889 it was decided to publish an engraving of the picture, and he received from Mr. Cadbury Jones, a partner in the firm of Millard & Co., a letter, which, he said, only referred to the right of reproducing the picture as a mezzotint engraving. In February 1890 the letter was repeated in a formal letter of the firm, which also only referred to the engraving of the picture and to copies thereof sold and all rights in connection therewith; and the plate for the engraving was to be prepared at the expense of Mr. Jones or his firm; and Mr. Schmalz, he said, "was to be at no expense in connection therewith." In September 1890 no steps having been taken by Mr. Jones or his firm to proceed with the engraving, the arrangement, as Mr. Schmalz said, was abandoned by mutual consent and was superseded by an agreement in writing in two letters between the artist and Mr. Jones (produced), which referred only to the right of reproducing the publication in the form of an engraving; and Mr. Schmalz was to have the plate prepared at his own expense, and the publication became a joint adventure. In pursuance of the agreement, he caused to be engraved, at an expense exceeding 150*l.*, a plate of the picture, which was ready for printing in May last. The firm, however, in that month was dissolved by a decree in Chancery, and Mr. Schmalz was informed by Mr. C. A. Millard that the publication of the engraving would have to remain in abeyance, and as no steps were taken for the publication, and Jones and the firm were unable to carry out their arrangement, he, on July 18, 1891, wrote to Mr. Jones cancelling the agreement. It appeared that Mr. Jones and Mr. Millard were now disputing as to the right of publication, and that the Chief Clerk in the Chancery proceedings had declined to include the copyright in the assets of the firm. Mr. Schmalz had since ascertained that in March 1890 the copyright of the picture was registered at Stationers' Hall as the property of Millard & Co., and that this was totally unauthorised by him, as the agreement had been cancelled, the effect of which was, as Mr. Schmalz complained, to prejudice him seriously and prevent his making any arrangement with other publishers for the publication of the picture. In answer to this statement of the facts, Mr. Millard made an affidavit that there was an actual assignment of the copyright by Mr. Schmalz to his firm at the date of February 20, 1890, and that he had never consented to the alleged arrangement; that the partnership was dissolved by decree in April 1891, and that any letter of Jones of July must have been private and contrary to good faith as a partner; and that any claim of Jones to the copyright was groundless and had been given up, and that the alleged agreement of September 1890 was a private agreement between Mr. Jones and Mr. Schmalz, and one which did not bind the firm. Upon these affidavits an application was made on the part of Mr. Schmalz, the artist, to the Vacation Judge, Mr. Justice Collins, to erase the entry of the copyright at Stationers' Hall as on Mr. Millard. The entry was as follows:—Date, March 18, 1890, painting of girl's head and bust, entitled *The Young Duchess* (photograph attached). Date of assignment, February 20, 1890. Names of parties, Herbert Schmalz, Claude Albert Millard & Co. Name of proprietor of copyright, Claude Albert Millard & Co., 57 Charing Cross. Name of author, Herbert Schmalz, Holland Park Road, Kensington. The application was under the original Copyright Act (5 and 6 Vict. c. 43, section 14) applied to pictures by the Art Copyright Act of 1862 (25 and 26 Vict. c. 68). And on hearing the case the learned judge made the order to erase the entry of Mr. Millard's name as proprietor, and this order having been obeyed Mr. Schmalz had got his own name entered as proprietor. Mr. Millard, the publisher, desired to appeal against the order of erasure, but when the case came on the objection was taken that there was no appeal against such an order as that, at all events, if there was any appeal there could be none from an order of the Vacation Judge sitting as a Divisional Court to a Divisional Court, but that it must be to the Court of Appeal, and cases were cited in which it was held that there was no appeal under the original Act (*Ex parte* Davidson, 18 Com. Bench Reports) and Chappell *v.* Purday (12 Meeson and Welsly Reports), and there being no express provision for appeal in the later Act, the Art Copyright Act of 1862. The learned counsel for Mr. Millard (Mr. Ruegg) was not prepared to argue the question, and the case for his client's convenience was postponed, on condition of his client paying the costs of the delay arising from the postponement. The case now came on again, but the appellant, it appeared, had not complied with the condition and did not appear.

Mr. Scrutton appeared for the artist, Mr. Schmalz, and, having stated what had occurred, moved that the appeal should be dismissed with costs.

Lord Coleridge said it must be so, and he and his learned brother, upon the question, which was a very important question, whether there was an appeal or not, were disposed to think that there was no appeal, especially as under the original Act it had been twice decided that there was no appeal, and none was given in terms by the later Act. But, at all events, they thought that there was no appeal from an order of a Vacation Judge to a Divisional Court. However, they must, as the case stood, dismiss the appeal with costs.

ART AND NATURE.

A COURSE of ten weekly lectures on the relation between art and nature has been commenced by Mr. R. A. M. Stevenson in the City Art Gallery, Manchester. Mr. T. Worthington, who presided at the opening lecture, said the Council of the Manchester Institution had hoped to make arrangements for a series of lectures during the previous season, but for reasons it was unnecessary to go into they had not been able to do so. The original purpose of the Institution in its lectures was to take up some subject connected with art rather than to give occasional lectures on various subjects. They had done well, he thought, to come back to their old quarters. The Mayors of Manchester had always very kindly given them

the use of the Mayor's parlour at the Town Hall, but as there was sometimes a doubt as to whether it would be available, it had been thought better that they should come back to the old house. If the present experiment proved a success they looked forward to a repetition of the old lectures given under the auspices of the Institution before the place was taken over by the Corporation. Part of the contract between them and the Corporation was that the Corporation should provide the Institution with a suitable lecture-room; but as the old lecture theatre had been converted into an art gallery they would in the meantime try what could be done with the present room.

Mr. Stevenson, in beginning his lecture, said he was afraid that art was too much talked about. Almost a religion, or, what was more, a superstition, had grown up round the arts; and if art was to be made too much a public virtue, to the exclusion of private enjoyment, it would become as shoddy as most other public virtues. He was not going to place before them so much a system of æsthetics as an attitude of mind. He did not want to make them feel what art was philosophically, but what it was to the people who practised it. The lectures would contain no formal scheme of teaching, but he would attempt to convey a condition of mind induced by twenty years' practice of painting in various schools and by much talk with various artists. The school to which he was himself most addicted was the modern French school, but he would not seek to impose upon them his own particular likings. Indeed, they would do well not to believe all he said to them. His object was to separate the work of the artist from the ordinary work of life, showing wherein they differed. He supposed all men to be gifted with the ordinary human sentiments. The artist he considered as a man who, over and above the possession of these sentiments, had a more keen appreciation than others of the material of some art. The artist, in fact, was a specialist just as a mathematician was a specialist; and as he was dealing with a special material he required a special imagination. Imagination was a separate faculty in each of the arts, and if there was any underlying general faculty beneath the man and the artist and the work of the artist, it was sentiment, not imagination. He rather regarded imagination as a faculty which varied with the varying material of the different arts. He wanted to bring out two faults particularly applicable to English criticism. First, the confusing of sentiment and imagination, which led people to look rather at the title of a picture than at the way it was painted. Secondly, the neglect of the material limitations and conditions of the medium used, leading to the confounding of things suitable to be expressed in words and things suitable to be expressed in form.

WATER-COLOUR PAINTING IN SCOTLAND.

THE annual luncheon of the Royal Scottish Society of Painters in Water-Colours was held in Glasgow last week. Dr. Forbes White proposed "The Royal Scottish Society of Painters in Water-Colours." He was specially glad to be present, he said, because it gave him an opportunity of expressing for himself and others outside the Society, the great indebtedness under which they lay to them for their constant efforts to make life sweet and happy by such exhibitions as the present one. They all knew that the art of water-colour painting was strongly associated with England—in fact, it was held to be an English art exclusively coming from Paul Sandby and Girtin downwards through the great painters to Cox, Prout, and all these great names, and culminating at last in the great Turner. With these the greatest of water-colour paintings was chiefly associated. But it was impossible to confine it to such a narrow sphere. It spread during the last century to France, Spain, and last of all to little Holland, all of which were now giving their energies to the production of water-colour works. Holland—the little country corresponding to our little Scotland—occupied a very prominent position in water-colours at the present time, and let him say in passing, what all the members of the Society would agree with him in, that they had learned with great regret of the recent death of the great Dutchman, Johannes Bosboom, who was so largely identified with interiors, and who touched nothing in water-colours which he did not adorn. But was it to be supposed that Scottish artists should stand aside and take no share in working with the water medium when so many Scottish artists were well known for their skill in oils? Thanks to the organisation of that Society some fourteen years ago, the Scottish artists banded themselves together to form that Society, and had held with marked determination to their original purpose, and he said it was all the more to their credit because they had gone on amid great discouragement—discouragement which would have baffled any people but the patriotic Scots. It unfortunately could not be said that the Society had flourished financially. Their exhibitions, he was sorry to say, had frequently a deficit. This was, alas! too frequently the experience of all such exhibitions in Scotland, but, undeterred by that, they had gone on, and year by year, if their exhibition was not large, it seemed to him to be always getting finer in quality. How was it, he asked, that a city like Glasgow was unable to provide sufficient attendance to make an exhibition of this sort pay? He was inclined charitably to believe that they did not take sufficient means to make the exhibition known, for, if it were known, he could not but believe that Glasgow would come in large bodies to see their exhibition. Glasgow was promoting a great temple for the promotion of music and fine arts. One could only hope there was to be a great resurrection of the minds of the people in regard to art, but they might build a temple as fine as they liked, only unless they stimulated the love of art among the people their labour was in vain. Another very encouraging feature came from the other side of the island—from Edinburgh. He read with extraordinary pleasure in the newspapers the account of the new charter which the Royal Scottish Academy had got. If he read rightly, that was a liberal and comprehensive charter, which would in a great measure solve the difficulty and take away much of the rivalry which existed between the east and the west. It seemed to him to open up a great opportunity before the country of making that Academy—which was to be honoured for its traditions and the work it had done in the past—of giving it the full power of making the ancient Royal Scottish Academy co-equal with the wants of the Scottish nation; and that round the Royal Scottish Academy, like a foster-mother, they would gather, and she would become a centre of light and influence under this new charter, which might really do a great deal towards improving the cultivation of art among the people. He was privileged to see the reply of Mr. George Reid to the Academicians when they sent their message asking him to accept the position of President. It was short, but it was to this effect, that he would accept the position by the act of the Royal Scottish Academy, and he added, "and the benefit of art in Scotland." That struck him at the time as being the keynote which was properly to be sounded by a new President of the coming time, and if he did not mistake Mr. Reid, he would be a man who would in the most generous, large-hearted way carry out the full idea of the new charter in all its comprehensiveness. From that he believed might flow a course of happiness which would give pleasure and benefit to most of Scotland and to all those interested in these high things, and which would certainly stimulate a Society such as the present to carry on its excellent work.

The Chairman, in responding to the toast, said he was sure they would one and all sympathise with the President in the domestic catastrophe which had so suddenly come upon him. On behalf of the Society, he did not wish to blow their trumpets too strongly, but they could point out on these walls around them the immense progress they had made in the last five years. Five years ago there was a great deal of amateur work on the walls. Now, on the contrary, there was none; but there was evidence of the rare skill which their craft displayed in their work. They did not, however, lay the flattering unction to their souls that they were perfect. They were far from that. There were many things which they ought to have done which they had not done; and he asked the members if they had made a sufficiently special study of seizing the fleeting beauties which beset them as landscape painters, and had taken any special pains to depict them? He also reminded them of the value of friendship, because if they knew each other better the spirit of competition would give way to the spirit of honest emulation.

DUNDEE INSTITUTE OF ARCHITECTS.

THE eighth session of the Dundee Institute of Architecture, Science and Art was opened on the 4th inst. Mr. Charles Ower, C.E. (the president), occupied the chair, and stated that it had been customary to open the session with a conversazione, but that function had been postponed till the 18th, on which day it was expected that the Marquis of Lothian, Secretary of State for Scotland, would open the Fine Art Exhibition. Professor Baldwin Brown gave a lecture on the "Growth of Cities." He began with a detailed account of Old Dundee, and explained its topography by the help of a limelight view of the city from the slopes of the Law and a reproduction of Crawford's eighteenth-century plan of the town. Though there were three eminences round the city, the Steeple seemed to have been the citadel from which enemies were kept at bay, the ordnance being fired from the windows at the top of the lofty structure. Professor Brown proceeded to say that there were two kinds of city—the old and the new; the old city which grew up irregularly, just as nature prompted, and the new city, which was laid down according to a regular plan. In Dundee they had no striking contrast between the old and the new city, and perhaps the most notable instances in Britain were to be found in Edinburgh and in Bath. This led the lecturer to speak of the rectangular planning of Edinburgh, and to say that that feature was conspicuous in ancient Greece. Old cities were laid out with a view, not so much to the convenience of the

inhabitants as to the keeping of enemies at a distance. In addition to the rectangular there was the radiating principle of forming cities, branching out from the centre after the manner of spokes from a wheel, and this plan was seen to advantage in Paris. Referring to the Mediæval and Classical (or regular) styles of architecture, he said that, while with the one they secured charm, picturesqueness and variety, with the other they got dignity and stateliness. A large number of views were shown as illustrating the points of the lecture, and, in conclusion, capital pictures of the Dundee Town Hall and the Morgan Hospital were exhibited. In regard to the Town Hall, he remarked that while one might wish to see a grander building, one would, at the same time, desire to retain its massive and substantial appearance. Mr. Mackison expressed the opinion that towns ought to be spread over a larger area than was customary at present, and he did not think it was for the good of any city that the well-to-do people should live at a distance from it, as thereby they removed that influence which otherwise they might exert for the benefit of the community. All classes of society ought to come more in contact with each other. Due regard should also be paid to the advisableness of not planting works injurious to public health in the vicinity of dwelling-houses. Mr. C. C. Maxwell thought that, with so many public-houses, unsanitary dwellings and heavy taxes, it was not surprising that people should try to escape from them. The Chairman proposed a vote of thanks to the lecturer, and Professor Brown, in acknowledging, alluded to the naturally fine situation of Dundee, and said there was scope for the formation of a beautiful city in the west-end district.

A LIVERPOOL SQUABBLE.

AT the last monthly meeting of the Toxteth School Board the subject of the condition of the school was considered. According to the *Liverpool Mercury* the minutes showed that for some little time past correspondence had been proceeding between the Board and Messrs. C. O. Ellison & Son, the architects of the school premises, as to certain variations. The Board, it appeared, had called in Mr. T. Mellard Reade, who, after investigation and examination of the structure, reported in particular as to the basement rooms, which were intended to be used as workshops for the purposes of technical education.—Mr. Thomas read sections of this report. The walls of these rooms, Mr. Thomas stated, were described by Mr. Mellard Reade as very damp and covered with a thick efflorescence. An examination of the ground under the main schoolroom showed that it was filled with stuff, but of what it consisted, further than what could be examined near the surface, which was partly peaty soil or sand, he could not say. In its present condition this room, from damp and want of ventilation, was not fit to be used as a workshop, but Mr. Reade thought it possible to make it fit by covering the walls with a good strong coat of hydraulic cement, concreting the floor, and effectively ventilating it by air-shafts, inlets and other appliances. The cause of the damp was capillary soakage through the walls from the surrounding ground. Mr. Thomas went on to say that this matter had been kept from the public hitherto, but he considered that it was right that the ratepayers should know whatever was in it.—Professor M'Cunn thought that the letter of Messrs. Ellison should be considered by the Sites and Buildings Committee, as they might then go into more detail than was advisable there.—Mr. Edwards said that he was strongly of the same opinion.—Mr. Macandrew said that Messrs. Ellison had emphatically declared that the correspondence was closed, so that no good could come of further letters.—Mr. Thomas said that it was not for Messrs. Ellison to take up such a position as that; it was for the Board to say whether or not more should be said.—In the course of a further discussion on the subject it appeared that Messrs. Ellison had also called in "three of the best-known architects in the city," from whom reports were by them submitted. Messrs. Ellison said that the two variations adopted were entirely beyond the Board's control, and being absolute necessities arising during the execution of the work demanding the most prompt attention and care to prevent accident to men and danger to property, were dealt with by architects "in the usual way," as by architects who knew their duty to clients, and that in the steps taken they had the sanction of the then chairman of the Sites Committee, as set forth in a letter.—Ultimately the Board referred Messrs. Ellison's correspondence to the Sites Committee, and decided to instruct Mr. Mellard Reade to draw up specifications for the execution of the work recommended in his report.

In a letter to the local papers Messrs. Ellison & Son offer the following explanation:—

In order rightly to estimate the real value of the complaints made, the ratepayers should know that the Mr. Thomas who figures so prominently at the Board's meeting, and who is now the chairman of the Works Committee, practises as an architect, and a few months prior to his election on the Board he suffered at our hands a severe defeat in a well-known local competition, since which he has exhibited anything but a friendly feeling towards us, and that may probably account for a good deal of annoyance we have of late experienced in this matter. We notice that after quoting from Mr. Reade's report, and giving his own version thereof, Mr. Thomas said, "This matter had been kept from the public hitherto," and he considered it right that the ratepayers should "know whatever was in it," a statement with which we fully agree, provided the whole facts are stated; hence our reason for this letter, especially as our last and reports from the three architects accompanying the same have not been made public. First, as to the two "variations" referred to at the Board as made by us. One was the substitution of a solid 18-inch wall, built in cement, for a 9-inch cavity wall, as in plan, which was absolutely necessary to protect the adjoining property—only 4 feet distant—owing to the wet weather causing the ground to fall in, and demanding immediate attention to prevent accident to persons or property. We therefore dealt with it promptly in the interests of the Board. The other "variation" referred to being the non-drainage of a window area, owing to its level being below the public sewers—over which we had no control—and it was simply left for time to prove whether it had better be filled up or covered over with glass, both variations being known to and approved by the then Works Committee, as the following letter from the chairman to us abundantly proves:—

"25 Water Street: October 26, 1891.

"Messrs. C. O. Ellison & Son.—Gentlemen,—I am much astonished to hear that complaints are now being made as to the work at St. Michael's Schools, and feel it a pleasure as chairman of the Sites and Building Committee having charge of the work to say that, being often on the site during its execution, I was fully aware of the difficulties of the foundations, and with my committee thoroughly satisfied with not only the way you overcame them, but the general excellence of the work throughout, which will, I believe, bear the strictest scrutiny by unbiassed practical men.—Yours truly, SAMUEL HOUGH."

So much for the variations complained of by Mr. Thomas to the Board of which he was not even a member until a year or more after the schools had been completed and occupied. With reference to the so-called defects in the buildings which we, by the Board's request, reported upon fully in July last, and Mr. Reade more recently, when we found the latter report was being obtained, we wrote to the gentleman named offering him every possible information as to the buildings; and also requested, for our own satisfaction, three other architects of equal eminence with Mr. Reade to inspect and fully report to us on the same points, copies of all which reports we sent with our last letter to the Board; and we should be glad if the Board would publish them all in full, that the ratepayers may have the most complete information, instead of mere comments by Mr. Thomas on one side only.

We give the opinions of the three Liverpool architects who inspected the schools by our request, and whose reports we forwarded to the Board, inviting them to publish the whole; but as their meetings are only monthly, we think the substance of the reports should be given to the ratepayers whilst the matter is fresh in their minds.

Messrs. Thomas Wainwright & Son and Colonel Walker, F.S.I., made a joint report, which, after showing how practically baseless were the complaints made, concluded as follows:—"As to the premises generally, the more we examined them the more were we impressed with the unusually good quality and appearance of the work, and we know of no school buildings anywhere which have been so long in use and show less signs of the hard wear and tear of school work."

The report by Mr. T. D. Barry, C.E. (past president of the Liverpool Architectural Society), may be summed up in the following paragraph:—"Living in the immediate neighbourhood, I had frequent opportunities of seeing the work during its execution, and having visited the premises since their completion I can speak with every confidence as to their highly satisfactory condition, and have no hesitation in saying I believe the buildings are such as any Board ought to be proud of possessing or any architect of having carried out; and if the complaints as to the basement walls, which I was refused permission to see, have no better foundation than the others, of which I am able to express an opinion, they are small indeed, and, together with the refusal for inspection, point to a motive somewhere other than to ascertain the facts of the case."

In finally concluding our correspondence on this matter, we can but rejoice that in such extensive premises the most critical examination has left the complainant but a basement workshop to find fault with, and that actually unfinished, and with the earth only for a floor, by the then Board's own instructions three to four years ago, it being thought best (and wisely so) to leave the completion thereof until the time came for using the cellars, and their actual purpose could be defined. This time seems now to have arrived; and although we, as the architects,

are not to do the necessary work in "the usual way," we are glad to find that the floors are now to be concreted, and that the walls are sufficiently dry to allow of their being cemented over, although water had been allowed to run into them ever since the completion of the building two years ago, for want of flags in the common passage adjoining, and to which we called attention in our unheeded report of July last. As appears by the press report, we have, under the peculiar circumstances of this case, declined to be led into further correspondence in this matter with the Works Committee under its present chairman, but we are quite willing that the Board should publish all communications that have taken place between us, without comment or reservation.

In reply, Mr. Thomas writes:—A letter has recently been published emanating from Messrs. C. O. Ellison & Son, architects of the St. Michael's Schools for the above Board, and gravely reflecting upon me as a member of the same. Had these gentlemen merely confined themselves to defending their work, it would have been sufficient to leave their injudicious letter unanswered. The attempt to prejudice public opinion while the merits of this work are under consideration is too undignified and unprofessional to call for further notice. As, however, Messrs. Ellison & Son have endeavoured to import personalities, openly directed against me, into their "case" (which may tend to obscure the real issue in the minds of the public), I beg you to allow me to explain that, though otherwise I should be most happy to fully reply to their personal insinuations, I feel that this is not the fit time to do so. As a matter of professional etiquette, and in discharge of my public duty to the Toxteth School Board as chairman of the Works Committee, I willingly abandon all personal feeling, and am sure the Board will deal with Messrs. Ellison on their merits or demerits, as the case may be. A newspaper controversy (which, while professing to discontinue, they evidently desire to provoke) scarcely provides the proper means for practically investigating the quality or value of the work Messrs Ellison & Son have done. The Board, however, will doubtless prove quite competent to judge critically and equitably; and will not, I trust, be prejudiced even by the ill-advised action Messrs. C. O. Ellison & Son have taken.

GLASGOW ARCHITECTURAL ASSOCIATION.

AT the monthly meeting, the president, Mr. William J. Anderson, in the chair, a paper on Ruskin's "Stones of Venice" was read by Mr. L. Douglas Penman. The scope of the review was limited to the sections bearing particularly on the Venetian buildings, passing the less satisfactory portions devoted to disquisition on architecture in general, that are vitiated by the palpable bias of the writer, who throughout extravagantly eulogises Gothic and illiberally depreciates Renaissance art. His power of critical analysis is more admired, and with such a subject as St. Mark's there is full scope. His commentary is searching and suggestive, and always eloquent. By means of a fine series of photographs the features of the buildings of Venice were well illustrated. Mr. John Stewart opened the discussion which followed, after which the customary vote of thanks was passed to Mr. Penman.

DISTRICT SURVEYOR'S FEES.

IN the Court of Appeal, before the Master of the Rolls, Lord Justice Fry and Lord Justice Lopes, the case of Moir *v.* Williams was decided. It was an appeal from the decision of a Divisional Court, consisting of the Lord Chief Justice of England and Mr. Justice Mathew. Messrs. Moir, Wallis & Co. are builders. Mr. Williams is the district surveyor for Kensington, and in that capacity he surveyed, under the provisions of the Metropolitan Building Act, 1855, some new buildings in Kensington Court Gardens erected by Messrs. Moir. The question was as to the fees to which he was entitled for so doing. The buildings consist of fourteen separate sets of chambers under one roof, but intended to be separately occupied. They have only one entrance to the street and only one staircase, which entrance and staircase are common to all. Each set of chambers has its separate entrance, giving access to the common entrance and staircase. The separate sets are divided from each other horizontally by party arches and fireproof floors, and vertically by party walls. Mr. Williams claimed to be entitled to treat each set of chambers as a separate building, and to have fees for each accordingly. On the other hand, it was contended that the building was one building only. Mr. Curtis Bennett, the metropolitan police magistrate at West London, before whom the dispute came, decided in favour of Mr. Williams's contention, but his decision was reversed by the Divisional Court on a special case stated. Mr. Williams appealed.

The Attorney-General (Sir R. E. Webster, Q.C.) and Mr. A. J. Ram were for the appellant, and Mr. Finlay, Q.C., and Mr. Morten for the respondent.

The Court dismissed the appeal.

The Master of the Rolls said the question was whether this was one or fourteen buildings. The appellant had undertaken to survey all the buildings in a certain district, and he was entitled to certain fees. He was the surveyor under an Act of Parliament for a public body, and he was only entitled to the fees prescribed by that Act. Part I. of schedule 2 of the Act fixed a fee of so much for "every building" surveyed by him. The word "building" must be given its ordinary and natural meaning unless there were something in the Act which caused it to be construed differently. The ordinary sense in which the word was understood was a single block of brick or stonework covered in by a roof. That view was certainly assisted by section 51, which spoke of the surveyor's fees being payable within a month after "the building" was covered in with a roof. On the other hand, reliance was placed on section 27, which, in subsection 2, said that the sets of chambers in a building were to be deemed separate buildings. But when that section came to be examined it turned out to be only a series of rules or directions for the manner in which buildings should be separated. Therefore, the proviso as to sets of chambers being deemed to be separate buildings only referred to the provisions of that section, and could not be extended to the whole Act. Therefore, the buildings in question only constituted one building within the meaning of the Act, and the appellant was only entitled to one fee.

Lord Justice Fry concurred. This was certainly one building in the popular sense, and would be spoken of ordinarily by people as a handsome or an ugly building. But it was contended that section 27, subsection 2, compelled sets of chambers to be deemed for all purposes separate buildings, and therefore that this was not one but fourteen separate buildings. If that were so, it was difficult to see what was to become of the staircase, as to which the surveyor had certain duties, and which, according to that view, would not be included in any building at all. He was clear that the proviso only referred to the enactments as to separation of buildings contained in section 27, and was not intended to extend to the whole Act.

Lord Justice Lopes concurred.

ART AND COMMERCE.

THE paper which Mr. Alma-Tadema, R.A., composed for delivery at the Wednesbury Institute was read, in his absence, by the Hon. H. E. Stanhope. The author began by remarking that there was no National Gallery in England until 1825. Now, however, it was second to none of the great collections the world was proud of. They owed that gallery in a great part to the public spirit of several kind donors. Who knew but what the Wednesbury Art Gallery, which they opened so hopefully, might not in the future time grow into a most enviable collection, from which the art-student, art-lover and everyone else would have an opportunity of studying the great beautiful flower of the human mind and heart, viz. art, and draw visitors from far and near. Then would the time have come when the Wednesbury Institute would need no more ask a painter to come and talk to the members about art in connection with industry, because by their experience they would be able to teach others; their workers would grow up studying their collection, and would profit by it, and apply its lessons upon their productions, and the whole of the district would gain by it. He felt sure he was fully entitled to count on such a happy future. His subject was one of many-sided interest, and very difficult to define in its widespread branches—especially difficult for a man who was more accustomed to appeal to his public with paint and brushes, with forms and colours, than with pen and ink, with words of verbal explanation. Art was as yet an unexplained expression of the human mind; but he highly appreciated the remark of a Belgian artist of great repute, "The soul of the artist must be the looking-glass in which the beauty of nature is reflected," and he would add to it the motto of a dear lady friend of theirs, "As the sun colours flowers, so art colours life." If they accepted that art had to awake in the spectator a higher sense of the beautiful, then they came naturally to the origin of all things—nature. What did nature do? If buildings fell to ruins, or a landslip made an unsightly gash, nature at once set to work to make it beautiful again by hiding and covering with plants and flowers what had become an ugly gap and formless mass. In fact, she was always adorning everything with beauty; and that should teach them to be grateful for all beauty and all good. All this, however, was art in its highest form, but they must not be surprised to find art represented sometimes in a lesser degree of influence. Turning to the second part of the subject, he said industry meant the production of arts and manufactures, and as the manufacture was nothing but the execution of a subject given by art, there must exist between art and industry the greatest

tie possible; and the more they worked hand in hand the better it would be for both. Art and industry were, in fact, inseparable. He traced the development of art from early times, pointing out that art had never been at a standstill, but had been directing industry and forming new laws according to the fresh wants and the expression of the industry of the time being. In conclusion, he pointed out how the country was profiting by the study in the South Kensington Schools, and recommended manufacturers and industrial men to visit the half-yearly exhibitions of the results of these schools at South Kensington. He defended the South Kensington Art Schools from attacks often made against them, and claimed with Sir Frederick Leighton that they should copy the example of the ancient Greeks in making the human figure the basis of their study. Besides these special schools there were other things of great influence, like art galleries and collections of all sorts, and lectures, those with diagrams especially; but above all, a more technical education for the child, which until very recently received so little attention.

SHEFFIELD SOCIETY OF ARCHITECTS.

THE monthly meeting of the Sheffield Society was held at the School of Art on Tuesday night, the 10th inst., Mr. Innocent, the president, being in the chair.

The following gentlemen were nominated for the studentship of the Society:—Messrs. C. F. Innocent, Frank Wilson, Oscar Bromley, Brook Greaves, W. A. Hall and W. Woofinden.

A paper was read by Mr. E. M. Gibbs, vice-president, on "Architectural Education in Sheffield." He argued that the present system of pupilage, although well adapted to the learning of the practical duties of an architect's office, required further aids in pursuing the higher artistic and scientific studies called for by the programme, and he thought the want would be supplied by the establishment of a local class or studio on the lines of the new efforts of the London Architectural Association. Having explained this new departure, he regretted that all the classes had to be held and the studio opened in the evenings only; no doubt there was a good reason for this. He then reviewed the possibilities of establishing such a studio in Sheffield under the control of the Council of the Society, who would know best how to utilise to the full the advantages which such establishments as the School of Art, Firth College and the Technical School might offer to their students. One great object of such a studio would be the formation of a good architectural library. In conclusion, the lecturer trusted the architects of Sheffield would induce parents to give their sons the advantage of at least one year's training in the studio and classes before commencing their pupilage, and pupils should afterwards have ample time allowed them during the day for pursuing their higher studies, leaving them at liberty to devote their evenings to literature, music or the like.

THE SURVEYORS' INSTITUTION.

ON Monday Mr. R. C. Driver, president of the Surveyors' Institution, delivered his address. After congratulating the Institution on the increase of their members since May 1890 from 1,617 to nearly 2,300 of all classes, and the growth of professional literature as shown in the twenty-three volumes of "Transactions" and the four volumes of "Professional Notes," comprising together nearly 12,000 pages, he stated that there had been in existence for ten years a system of professional examinations as complete and thorough and as successful as anything of its kind in England. He also claimed that the Institution had done not a little to advance professional interests by binding surveyors together into an organised body, and by obtaining a charter which accredited them as duly qualified members of a regular profession. The Institution was not seldom the medium for the collection and communication of most valuable information for the use of Royal Commissions and Select Committees of both Houses of Parliament; but, above and beyond this, they had public functions of a specific kind conferred upon them by 41 and 42 Vict. c. 32, and section 28 of the London Council (General Powers) Act, 1890, the latter of the greatest importance as regarded the interests of that large class, the house and property owners of London. Mr. Driver then gave an interesting and elaborate analysis of the extent of the depreciation of land values during the last fourteen years, founded on the answers given to a circular letter sent out by the council in March last, in which the members of the provincial committees, some 800 in number, practising in every part of England and Wales, were asked to furnish the council with their opinions. The response was a very large amount of information of what appeared to be of a somewhat contradictory kind, but on closer examination it was found that most of the discrepancies could be got rid of by eliminating those returns which applied to whole counties or groups of counties. These evidently represented an attempt to generalise, and usually erred on the side of despondency. By confining attention to those returns which referred to more limited areas within the estimator's personal experience, it was found that a reasonable average could be arrived at. It appeared from the tables founded on these returns that the Chiltern Hills district of Oxfordshire had the unenviable position of head of the list, with an average reduction of 75 per cent., and South-east Essex was not far behind with 70 per cent. Indeed, had one of the extreme figures been incorporated with the average, the latter would have been *facile princeps* in this sorry competition. East and West Cambridgeshire followed with the high depreciation percentage of 60. In North Essex 55 per cent. appeared to represent the average depreciation, and 60 per cent. of the farms were unlet. The 50 per cent. depreciation in North-east, South and Mid Essex and in North and South-west Berks, the 46 per cent. in East Wilts and the 45 per cent. in North Hants, were averages based on a large number of returns, but which took no account of extreme figures. The only other abnormal figures not incorporated in the averages were 60 per cent. (clay soils) in South-east Warwick, 60 per cent. in the Bristol district of Gloucester, 60 per cent. in the Bristol district of Somerset, 50 per cent. in South Kent, 50 per cent. in West Sussex, and 50 per cent. in remote districts of Surrey. Generally, two facts appeared from this return—the first, that the depreciation over the heavy wheat land had not been overstated by common report; the second, that the depreciation in the pasture and dairy districts was somewhat less than had been previously supposed. It was also clear, from figures brought before him, but not printed in the address, that the depreciation had been far less in farms from 50 acres to 200 acres than in the larger farms. He might state, finally, that as the agreement between individual estimators was even closer in the figures under 20 per cent., farmers were, at all events, holding their own over a large part of England, and that landlords in the same districts had not been quite impoverished. Nevertheless, the fact remained that in some parts of the country a serious depreciation in land values had taken place. What were the causes and whence was the remedy to come As to the causes there was now a practical agreement that they were bad seasons, cheap imports and low freights. The remedies therefore were better seasons, absorption of the surplus food-stuffs at the places of origin, and a general rise of freights, to which some would perhaps add a higher rate of home production and an improvement in the effectiveness of labour. He had been favoured, by the courtesy of the officials of the Board of Trade, with an advance copy of the statistical abstract for the year 1890. This showed the imports of wheat (grain, meal, flour) for the years 1886-90. From Russia the imports of grain for the several years in cwts. were for 1886, 3,720,662; 1887, 5,501,380; 1888, 21,450,346; 1889, 21,310,304; 1890, 19,389,025. In meal and flour for the same years the quantities in cwts. were 3,743,272, 5,544,365, 21,682,890, 21,546,409 and 19,585,249. From Roumania the imports of grain, meal, &c., had steadily risen from 290,248 cwts. in 1886 to 4,663,227 cwts. in 1890. The returns from the United States were much more fluctuating and the number of cwts. of grain for the several years were 24,648,581, 30,530,263, 14,643,572, 17,009,036 and 17,201,063, whilst of meal they were 36,073,832, 45,390,678, 27,202,212, 27,052,756 and 29,226,863. From British India the returns varied between eight and eleven million cwts., the amount last year being 9,111,613 cwts. Last year from Australasia there were imported 3,188,833 cwts. of grain, meal, &c, as compared with 811,391 cwts. in 1886. The returns showed that the increase in the year 1890 in the imports of wheat, viz. 3,451,813 cwts., had been more than balanced by the decrease in the imports of barley, 722,922 cwts., and of oats 3,263,381, which, of course, was not without its effect upon prices. The failure of the Russian harvest and the consequent absorption of local stocks would probably weaken, for a time at any rate, one of the British farmer's most formidable competitors. The American harvest had been exceptionally good this year, but their exports of grain could hardly be long maintained on their present scale in face of the enormous growth of the population of that country. After referring to the depletion of the country districts and the fact that there was a decided decline in population in five English and nine Welsh counties, Mr. Driver commented on the re-establishment of the Board of Agriculture, which did such valuable work under the inspiring genius of Arthur Young. Criticising adversely the modern system of subventions in aid of rates (a system very antagonistic to the principle of popular control over local taxation), Mr. Driver examined the Acts under which the 750,000*l.* placed at the Government's disposal by the rejection of its licensing proposals was to be expended—the Technical Instruction Acts, 1889-91. He confessed to considerable doubts as to the practical outcome of this new departure, which might be described as an extravagant endowment of non-existent agencies for purposes yet to be determined. Had not the exigencies of

haute finance ruled it otherwise, it would have appeared to any practical mind that a well-digested scheme of technical education should have preceded its endowment. It was to be hoped that the Tithe Rent-charge Recovery Act of last session had taken the sting out of an agitation which might have been wider in its effects than its promoters supposed, or at any rate cared to admit. It was disappointing to learn that the long-promised metropolitan improvements were again deferred owing to a difference of opinion between our local and our Imperial Parliaments as to (not to use a word endued with latent heat) "the principle of assessing a special rate upon property which is shown to be increased in value by an improvement carried out at the public expense." The definition was Mr. H. H. Fowler's. He strongly objected to the principle. It was not accurate to ascribe the increase in the value of town land and buildings in any large degree to "communal expenditure." The values of such property rose because of the presence and prosperity of the surrounding community. Moreover, it was very clearly proved that, as a matter of fact and not of theory, rates, at any rate as regards London property, do already "come out of property." But, if the necessity for increasing the burden on property really existed, the separate assessment of sites would involve the payment of rates on ground rents by owners who had in many cases given high prices for these rents as investments, on the faith of the contract with the lessees that the ground rents should be paid free of deductions for rates. To alter the terms of the contract by enforcing the deduction of a share of the rates from those ground rents would obviously not only deprive ground rent owners of a part of the income for which they had paid a specially high price, but would seriously diminish the capital value of their investment by introducing the element of uncertainty into it. Equally cogent reasons could be assigned against the rating of vacant building land. Mr. Driver concluded his interesting address with an examination of the subjects of papers to be read during the session.

THE DOUBLE ROOF-MARKS ON JEDBURGH ABBEY.

THE double roof-marks on the Abbey of Jedburgh have been a puzzle both to architects and antiquaries. Not that it is uncommon to find double roof-marks on old buildings —even three are sometimes to be met with—but in the case of Jedburgh there is something peculiar, as will be shown in the course of the following notes. These double roof-marks are seen on the west side of the tower and in the nave. We remember having some years ago asked an architect, says a correspondent of the *Scotsman*, who was making a sketch of the Abbey, if he could offer any explanation as to these, and he replied that there was nothing easier, as they were simply marks of roofs of different periods. A few more questions, however, convinced him that the subject presented more difficulties than he at first dreamed of. It has been suggested that the lower "ragglet" of the nave aisles marks the pitch of the earliest roof, and that as the arches of the triforium rose above this roof the arches would be used as windows to light the centre of the nave until the clerestory was built. This is taken for granted, that the clerestory is of a later period than the under portion, while it is of the same transition Norman character, possessing, no doubt, features of its own. In a few instances such an arrangement had been adopted where it was found necessary to delay the erection of the clerestory for some time, but this does not seem to have been the case in Jedburgh. Besides, the double roof-marks on Jedburgh Abbey, as we are about to show, did not exist until at least two centuries and a half after the completion of the nave, which could not be later than the early part of the thirteenth century. As a proof of this, we may mention that the walls on which the markings are seen cannot be of earlier date than the latter part of the fifteenth century. At the east end of the north aisle there is a small portion of a Norman arch, and this arch, if entire, would have been crossed by the lower "ragglet"—though Billings in his drawing erroneously restores the arch in such a way as to be clear of it—and that of itself would go against the idea of this being the mark of the original roof. A very slight examination will show that there has been considerable alteration at this place. The north pier which originally supported the arch has disappeared, and a dead wall has been substituted. Then, again, by an examination of the east end of the south aisle it will be observed that here also there has been great alteration. When Abbot Thomas Cranston rebuilt the south-west pier of the tower he, heedless of the original plan, threw an arch over from that pier to the Norman pier near to the cloister doorway, much lower than the Norman arch, a fragment of which still remains, and again a dead wall fills the space between the newer pier and the old work above the arch. On the face of this dead wall double roof-marks are seen. Cranston also renewed the lower portion of the north-west pier of the tower, and it is not improbable that the dead wall referred to at the east end of the north aisle was built by him so as to strengthen the said pier. He also rebuilt at least part of the west wall of the tower. Cranston was Abbot before February 1484, and he still held office in 1494. Now this gives us a very near approximation to the date of the earliest of the roof-markings. We think that there can be little doubt that the upper one was the earlier of the two. It rises from the top of the aisle wall and goes up to the row of corbels immediately under the clerestory, these corbels being for the purpose of supporting the roof. When the tower was rebuilt at the end of the fifteenth century a roof of similar pitch was put up over the centre of the nave, as shown by the projecting "ragglet," and this was done, no doubt, so as to correspond with the gable-head at the west end. The upper part of the west gable does not now quite agree with this "ragglet," but this is owing to the gable-head having been taken down and rebuilt at the early part of the present century. The roof over the chancel was of the same pitch, as may be seen by the mark on the east wall of the tower. But what about the lower marking? That it cannot be the mark of an inner roof, as some have suggested, is clearly proved by the fragments of a water tablet, or drip-stone, which still remain in some of the cuttings on both sides of the nave, immediately above where this roof would join the wall; and also by the marking on the south wall of the tower, a little above the stone-vaulted roof of the transept, and which crosses an opening there in the same way as the lower marking on the west. It must therefore have been an outer one; but when could a new roof be rendered necessary? When the ends of the timber became decayed it was not unusual to cut off the decayed parts and lower the roof. In the case of Jedburgh Abbey, however, much more was done than the mere lowering, for along the whole length of the nave two cuttings—one for resting the top of the side aisle roof, and the other for the insertion of a drip-stone to throw off the water—have been made just at the spring of the including arches of the triforium, and this would necessitate the filling up of the subdividing arches in some way, but whether by windows or otherwise the effect would be anything but pleasing. Regarding the central roof of the nave matters are no less puzzling. The lower roof had crossed an opening in the under storey of the tower in the same way, a portion of the arch having been left outside; and it must also have crossed the St. Catherine's wheel at the west end, unless by some peculiar arrangement it was raised at that part. We can find another reason than the decay of the timber here that necessitated a change. In 1523, probably within thirty years of the erection of the former roof, the Abbey was burned by the English under the Earl of Surrey, after a whole day's cannonading, and at that time, we suspect, the nave and its aisles were rendered roofless. As there are no double roof-marks on the east and north sides of the tower, we may naturally infer that the chancel and north transept did not share the same fate as the nave at the date mentioned. It seems strange that in repairing the damage done by this destructive burning the roofs were not put up on the old lines, but in a position that entailed greater labour, and which must have spoiled all æsthetic effect. The next visits of the "auld enemies" were in 1544–45, when the whole Abbey was so sadly wrecked that no attempt was made to restore it, the canons contenting themselves with erecting a place under the tower for the carrying on of worship. The remains of this erection, which have come down to our day, are rude enough to show either that the taste of the canons had by that time become very much debased, or, what is more likely, that they had then no heart to restore their church to anything like its former beauty—a church that had undergone many vicissitudes and which was before long likely to undergo more. The thunder notes of the coming Reformation had been already heard, and were becoming louder and louder at the nearer approach of the storm.

PERSIAN ART.

THE opening lecture of the session of the Edinburgh branch of the British Typographia was delivered by Major-General Sir R. Murdoch Smith, director of the Museum of Science and Art. The subject was "The Place of Caligraphy in Persian Art," and the lecturer pointed out, to begin with, that printing from movable types was hardly, if at all, known in Persia. They were, however, the greatest adepts in the world in the nearly allied art of caligraphy, which was regarded among them as one of the fine arts. By way of introduction of the subject, he briefly sketched the character of the people, who were essentially western in their habit of mind, and he laid particular stress upon their imaginative faculty and inventiveness. He then proceeded to show how the development of Persian art was exhibited in the architecture of the country, and how it had accommodated itself to the limited materials at the builder's command. The material for the most part at the command of the builder was sun-dried brick, and the feature of

the architecture was the niching of the walls within and without, the use of stalactite-like pendants to ornament these niches, the ornamental arrangement of the brickwork, specially the indenting of the walls to give the effect of light and shade, and the adorning of the wall-surfaces with ornamental wall-tiles or mosaics. Some of the features of Oriental architecture imitated in this country and attributed to the Moors were, the lecturer said, really Persian in their origin. It was in the mosaic word decoration of walls that the use of caligraphy came in, and it served the double purpose of ornamentation and the inculcation of good precepts. The lecturer exhibited examples of this style of decoration on the spandrels of arches and of lintels and posts of gateways. In the same way he showed how the use of caligraphy entered into the ornamental scheme of tilework and earthenware generally, textiles and metalwork, and he exhibited examples of each mostly belonging to old Persian art, in which caligraphy for decorative purposes was beautifully applied in varied ways. Islamism in prohibiting anything which might be described as an image in Persian decoration had exercised a limiting influence on the art of the country, but the inventiveness of the people had enabled them either to evade the Koranic injunction, of which amusing examples were given, or had found an outlet in other directions. Every conceivable material had been pressed into the service of art, and he thought it might safely be said that it had touched nothing which it had not adorned. Perhaps no other race had shown greater originality in artistic faculty, and certainly none had exercised it through such a long succession of centuries. In many of our arts and industries in this country we were at the present moment either modifying or reproducing, consciously or unconsciously, designs which long ago emanated from the fertile imagination of our distant kinsmen of Iran.

CROYLAND ABBEY.

ANOTHER appeal for funds for the works at Croyland Abbey has come from the rector, the Rev. T. H. Le Bœuf. He writes:—I regret to state that since we recommenced the work on August 21, 1891, I have received only 86*l.* for section 7 and paid 208*l.* 15*s.*, whilst the cost of that section of work alone is 440*l.* 15*s.* The work done this year has been the repointing of the steeple (inside and outside) and north side of the tower, and making firm the pockets of the steeple in concrete. (Would that some kind friend made firm the pocket of the treasurer of the Croyland Abbey Preservation Fund!) The work in progress is the rebuilding of the squinch arches of the steeple and repairing the bell-chamber. The renowned bells of Croyland have not been rung for over three years by reason of the decayed condition of the oak beams which support the bell frame. I trust that this note may be read by some kind friend who may send us help direct, or be the means of bringing our great need before those who have the power to help us. Surely even a small donation from every member of our great antiquarian, archæological, historical and architectural societies would quickly remove our burden and enable us to make safe an abbey which dates as far back as the days of King Ethelbald, 716 A.D. Shall such societies suffer so venerable a building, so distinguished a landmark in our English history, as Croyland Abbey to fall into utter ruin? Have they not often admired and written volumes on this grand Benedictine monastery—the architectural fragments of successive mediæval centuries and legendary history? Shall not the readers of Kingsley's "Hereward the Wake" awake and feel an interest in Croyland Abbey and come and help us? Crowlanders can do little, as we suffer from agricultural depression, enfranchisement of copyhold property, and also from a heavy drainage tax of 10*s.* per acre, which, alas! does not prevent our land from being frequently under water, as it is for many acres at this present moment by the overflow of the river Welland. Therefore the necessity of my appeal beyond our parochial boundaries. Surely English Churchmen of the present day feel that they form the connecting link between the past and the future, and will help us to hand down to future generations this venerable national relic of past ages.

ARCHITECTURE—A PROFESSION OR AN ART?

THE following letter from Mr. Norman Shaw, R.A., appeared in the *Times* on Wednesday:—

Sir,—In the report of the opening address at the Royal Institute of British Architects contained in your issue of November 5, the President refers to a memorial sent to the Institute some months ago, signed by a considerable number of architects and many well-known painters and sculptors, protesting against the attempt now being made by the Institute to transform architecture from an art into a close profession by the introduction of a system of examinations and diplomas. The contention of the memorialists is that architecture is an art and not a profession; that artistic qualities (those qualities which make a man an architect) cannot be brought to the test of examination; and that a diploma of architecture gained by such means would be a fallacious distinction, equally useless as a guide to the public and misleading as an object for the efforts of the student. The views of the Institute and of the memorialists are too entirely opposed to be reconciled by the bland appeals and pointless platitudes of the President's address. The memorialists maintain that architecture is an art on precisely the same footing as painting and sculpture. The President of the Institute, with the full approval of its leaders, maintains that architecture is two-thirds a profession or business and one-third only an art. He divides those who practise architecture into three classes:—First, those whose proclivities are artistic; second, those whose genius is constructive; and third, those who *par excellence* are men of business, and who are presumably entirely wanting in the faculty of design. The memorialists also make this distinction, and they are fully alive to the necessity of good construction, but they think that the men forming the last two divisions are, as such, not architects at all. The scientific constructor already exists in the engineer, the business man in the surveyor and commission agent; but the Institute and its President indulge in no such nice distinctions. Students are to be indiscriminately examined entirely regardless of their natural qualifications. They are to receive the same diploma, which admittedly implies no power of design and a bare minimum of technical knowledge, whilst the public, whom the Institute is so anxious to help, will be left to discriminate for itself as best it can. Does not this line of action amply justify the memorialists, and does it not indicate only too plainly that the Institute, while professing to protect the public, is attempting to protect the architects; that it has never cared about art at all, but has expended such force as it has entirely on professionalism—that is, on the manufacture and protection of architects who shall be members of the Institute, rather than on the help and furtherance of the art of architecture?—I am, sir, yours faithfully, R. Norman Shaw, R.A.

MEMORIAL BUILDINGS AT THE HOLT, RAINHILL.

THE extensive memorial buildings which have been in progress during the past eighteen months have now reached a successful completion, and have been formally opened. The buildings have been erected at the sole cost of Miss Ruth Evans, in memory of her brother, the late Mr. Joseph Evans, colliery proprietor, of Haydock, to whose memory also Miss Evans is erecting large church and school buildings at Haydock and extensive elementary school buildings at Ashton-in-Makerfield, the total cost of the combined schemes, including land, being about 25,000*l.* The whole of the buildings are rapidly approaching completion from the designs and under the personal supervision of Mr. Thomas W. Cubbon, architect, of Birkenhead, the contractors being Messrs. Hughes & Stirling, of Liverpool and Bootle. The principal portion of the Holt buildings is the church, providing sitting-accommodation on the ground floor for about 650, having organ-chamber, vestry and cloak-room accommodation at the rear. The style of the design is Late Gothic in character, the plan of the church being cruciform, having chancel and transepts. The clerestory is carried upon handsomely-moulded arches supported upon massive octagon pillars, having richly-moulded caps and bases all of white Cefn stone, as are also chancel, transept and organ-chamber arches. One main front entrance and two side entrances are provided in addition to rear entrances. The buildings are faced externally with local red sandstone, and all the internal woodwork is of pitch-pine, toned and varnished. The rostrum, which is of handsome design, is constructed of selected pitch-pine, the angle shafts being ebonised, and other features richly moulded and carved. The traceried windows are filled in with enriched leadlights of beautiful design. The gasfittings, encaustic tiling, vestibule screens and decorative work have all been designed in harmony with the main structure. A handsome tower with spire occupies the south-west angle of the main building, and, rising as it does to an altitude of over 120 feet, is seen for many miles on all sides. The Sunday-school buildings consist of a large assembly hall, capable of accommodating over 300 children, and having in conjunction therewith four classrooms, each for about 18 scholars.

There is also a swimming-bath, 50 feet in length and 23 feet wide, having the sides lined with white enamelled bricks, and the bottom laid with heavy white tiles on a concrete bed. There are also a gymnasium, clubhouse and cocoa-rooms, with two large reading-rooms on the first floor, and a commodious residence for manager, accommodation for bicyclists, &c. The

principal sub-contractors employed upon the works were as follows:—Engineering to swimming-bath and heating, Messrs. Bradford, of Salford; leadlights and gasfittings, Messrs. Greatrix, Manchester; plumbing, painting and glazing, Mr. R. Robinson, of Birkenhead; wrought-iron art-work, Messrs. Hardman & Powell, of Birmingham; gates and railings, &c., Messrs. Macfarlane, of Glasgow; slating and plastering, Mr. Moore, of Manchester. General foreman, employed by Messrs. Hughes & Stirling (sole contractors), Mr. Clydesdale. The cost of these buildings, including furnishing, heating, lighting, ventilating, engineering to swimming-bath, organ and site, is over 10,000*l.*

CHURCH BUILDING AND RESTORATION.

Bowness.—The parish church of St. Michael has been re-opened after restoration, carried out from the plans of Mr. G. D. Oliver, architect, Carlisle. The works have been very carefully carried out by Mr. Joseph Crosthwaite, builder; Messrs. W. & H. Davidson, carpenters and joiners; Mr. G. Nicholson, of Wigton, concrete floors; Mr. Nanson, slater; Mr. Palmer, painter and glazier; and Mr. W. Anderson, plumber.

West Dulwich.—All Saints Church, Rosendale Road, has been opened. The building has been designed by Mr. George H. Fellowes Prynne, F.R.I.B.A., and tenders for the whole work obtained. The funds being inadequate, it was determined to build the church in sections. The first contract included the foundations at the east end, which were carried out by Messrs. Kynoch & Co. The second contract includes crypt, chancel, chapel, vestries, north and south transepts and four out of seven bays of the nave, the flèche and tower being, for want of funds, temporarily cut off at roof level. The present contract has been carried to completion by the firm of Messrs. J. & C. Bowyer, of Upper Norwood. The main scheme of the church shows a lofty nave 60 feet high and 40 feet wide and 128 feet in length, divided into seven double-arched bays, the piers being built of red brick and stone. Panels for decoration are formed over lower arches, and a clerestory in spandrels above. Three eastern bays open into the north and south transepts. The chancel and sanctuary are the same height as nave, 28 feet wide, 44 feet in length. The altar is placed ten steps above the nave floor level, and a good effect obtained both externally and internally by seven lofty windows at eastern end. The dividing arch between the chancel and nave is enriched with tracery supported by two slender columns rising from the lower screen. A wrought-iron rood screen spans the spaces between columns. This screen is one of the main points of the building, rising 54 feet to apex. The northern transept forms the nave of a chapel, the sanctuary of which is placed on the northern side of the chancel; clergy and choir vestries and organ-chamber are placed on the south side of chancel. An ambulatory runs entirely around the east end of chapel and chancel, connecting the northern turret with the vestries. The present portion of the church will accommodate about 1,000 persons.

NEW BUILDINGS.

Droitwich.—The Worcestershire Brine Baths Hotel (a view of which appeared in our issue of May 22 last) was opened on Wednesday last by a dinner given by Mr. John Corbett, M.P. Upwards of 300 sat down to a most liberal repast. The building has been erected at his own cost for the benefit of visitors to the brine baths. It is built in the old half-timbered style, the materials used being brick, timber and rough cast at a cost of 15,000*l.* The internal arrangements provide all that could be desired. Throughout it is most beautifully decorated, the ceilings being handsomely painted and encircled by gilded mouldings, the walls elegantly papered and the rooms most lavishly furnished. In the centre of the hotel is the main entrance with a *porte cochère*. On passing through the doorway the visitor walks into a spacious hall, which is intersected at right angles by a lofty well lighted corridor 10 feet wide. On the right is the office and on the left is the manager's room, and before him is the main staircase. This is of mahogany and pitch-pine; the soffits are of walnut and white wood. The coffee-room is 42 feet by 30 feet, the ceiling of which is divided into six panels, which are enriched by cornices 3 feet 6 inches in girth, and are picked out in eight colours, and the enrichments are gilded. The flats of the panels are decorated in the style of Louis XIV. In the centre of the room are two columns, the shafts painted to imitate rouge royal marble, the pedestals of Irish-green marble, the mouldings being gilded and white enamelled. The capitals are Corinthian in design and are decorated in white and gold. The woodwork is American walnut, with black-and-gold mouldings. In connection with this room is the gentlemen's writing-room. The drawing-room, 40 feet by 20 feet, is in two sections, being divided by an arch springing from two pilasters. The cornice, 3 feet 6 inches in girth, and capitals are treated in a similar manner to the dining-room, in light-tinted colours, gold being freely used. The flats of the ceiling are delicately painted. The chimneypieces and overmantels are of oak, richly carved and moulded. Leading from this room is the ladies' writing-room. There are two extensive lounges, one on the ground-floor and one on the first floor. These are treated in a similar manner to the drawing-room. Total number of bedrooms, 96; and on the ground-floor, first floor and second floor are six suites of rooms, each comprising sitting-room, bedroom, dressing-room and bath-room. The architect is Mr. John Robert Nichols, M.S.A., 59 Colmore Row, Birmingham; the contractor Mr. C. A. Horton, of Brierley Hill. The warming and culinary arrangements were supplied by Messrs. Clements, Jeakes & Co., London. The lifts by Messrs. Waygood & Co., London. The sanitary arrangements by Messrs. Doulton & Co., London. The decorations have been executed by Mr. Arthur Gee, of Stafford. The gasfittings by Messrs. Winfield & Co., Birmingham. The electric bells by Mr. E. Hill, of Birmingham. The stained-glass work has been executed by Mr. S. Evans, of Smethwick. Messrs. White & Son, of Worcester, laid out the grounds under the direction of Mr. Parker, Mr. Corbett's head gardener.

Birmingham.—The Masonic rooms in Severn Street have been opened. The architects engaged in the work of reconstruction and decoration were Messrs. Essex & Nicol, of Birmingham; the general contractor being Mr. Moorhouse, of Birchfield; the decorative work being carried out by Mr. John Taylor, of Broad Street.

Leith.—The new council-chamber at Leith was occupied for the first time for the first statutory meeting since the election took place. The new council-room is 22 feet by 34 feet 9 inches, with a height of ceiling of 17 feet 6 inches. There are five windows to Charlotte Street and two to Constitution Street. The ceiling is divided into several panels, the main panel having circular and oval wreaths and other ornaments. The ceiling, which has been formed with stucco of the finest quality, is enriched with ornaments designed and modelled expressly for it. The walls have been plastered and finished with framed, panelled and polished walnut, and the division separating the public part of the room is also of polished walnut. The floor is laid with oak, divided into panels and border designs carried out in walnut. The room is lighted by three Wenham lights specially designed to correspond with the architecture of the room. There have also been added a cloak-room, a retiring-room for the members and spacious lavatories. The following were the principal contractors:—Masonwork, Wm. Baxter, Leith; joinerwork, Drysdale & Gilmour, Leith; plumber and gasfitting work, Thos. Macpherson, Leith; plasterwork, J. S. Sutherland, Leith; painting work, Bonnar & Carfrae, Edinburgh; furnishing, Messrs. Miller & Son, Leith.

GENERAL.

The Royal Scottish Society of Water-Colours holds its exhibition this year in the Institute Rooms, Glasgow. One hundred and ninety-three drawings have been hung.

Works intended for the next Annual Exhibition of the Royal Hibernian Academy will be received up to February 5.

The Royal Cambrian Academy Exhibition, which has just closed, was visited by 10,172 persons, and 114 pictures were sold, realising 2,358*l.*

An Obelisk of red and grey granite, 20 feet in height, with drinking-fountain and troughs for cattle, has been presented to the Corporation of Newcastle-upon-Tyne as a centenary memorial of John Wesley.

A Carved Table, used by James II. during his visit to Cork, was sold a few days ago in that city for six and a half guineas.

Mr. Samson Fox, C.E., has been re-elected Mayor of Harrogate.

The Birmingham Architectural Association will have a conversazione on Wednesday next in the Edgbaston Assembly Rooms.

Mr. W. J. Wainwright intends to present to the Birmingham Art Gallery the portrait of the late Mr. Henshaw, painted by himself.

A Relic of early times in the shape of a canoe, formed out of a solid trunk of oak, has lately been unearthed during the course of repairs to the banks of the Clyde.

The Longton Town Council have approved of the Aynsley memorial clock tower and fountain for the Queen's Park, which they have decided should be erected in the centre of the triangular bed opposite the Carlisle Street entrance.

At the Meeting of the Staffordshire County Council the General Purposes Committee reported that they had concluded arrangements for purchasing Eastgate House and other properties extending therefrom to the Judges' House, for the purpose of Council committee-rooms, offices, &c.

The Architect.

THE WEEK.

For several years past there has been talk about the purification of the river Liffey, which, like a diameter, divides "dear, dirty Dublin." The Government have instituted inquiries from time to time, and many engineers have prepared schemes of improvement. The river serves as an open sewer, and it is the most malodorous in Europe, but there is evidence to show that the inhabitants of the houses on both sides do not suffer from the emanations which are so overpowering to strangers. Whether the river affects the health of people in other parts of the city can hardly be ascertained. The death-rate is very high, but unfortunately there are many other causes besides the Liffey to account for it. If the river must be used as the main sewer it would be well to adopt the plan of the late Henry MacManus, the artist, and throw an arching across, uniting the quays. But, as in other places, it would be preferable to construct special sewers, and there is not much difficulty in discovering places north and south of the city which would serve for the deposit of the sewage—that is, if utilisation must be abandoned. The Corporation propose at length to deal with the problem, and a scheme has been adopted which is to cost 250,000*l.* According to the plans, the whole of the sewage is to be carried to a spot near the Pigeon House, beyond Ringsend, where the Liffey enters the Bay of Dublin. It will be necessary to bring the main sewer of the north side of the city beneath the river, but that is not a difficult operation. Precipitating tanks will be erected, and the effluent water will probably not be more polluted than what falls into the Thames at Chiswick or Mortlake. But as the Pigeon House has some importance as a fort, the War Office will no doubt provide that danger cannot arise to troops. An effort will be made to avoid the expense of a Parliamentary inquiry and the inevitable opposition to a Bill. It is believed that an order under the Public Health Act will give the necessary authority for undertaking the works and to enable the Corporation to obtain any land that may be required as a site for the tanks and machinery.

It is to be regretted that Mr. Rogers was not successful in his action to recover 123*l.*, the balance of his fees as architect of a house at Brockley. We narrated the circumstances when the case was tried at Maidstone. It will be remembered that the defendant counterclaimed for damages for negligence, owing to the plaintiff's not properly supervising the building of the house, in consequence of which the builder omitted to put concrete into the foundations and omitted to do other works. The plaintiff denied that he was negligent, and further stated that, in giving his final certificate to the builder, he deducted 82*l.* in respect of the omissions from the amount certified to be due to the builder, and contended that this certificate was binding upon the defendant under clause 16 of the contract between the defendant and the builder. Clause 16 of the contract deed provided that "the decision of the architect with respect to the amount, state and condition of the works actually executed, and also in respect of any and every question that may arise concerning the construction of the present contract, or the plans and specification or the execution of the works hereby contracted for or in anywise relating thereto, shall be final and without appeal." The jury found that the plaintiff had been guilty of negligence, and found a verdict for the plaintiff on the claim for 58*l.*, and for the defendant on the counterclaim for 90*l.* In the Court of Appeal it was argued on behalf of Mr. Rogers that the final certificate was binding on the building owner as well as the builder. The Master of the Rolls, however, declared that was not the law. According to his lordship the certificate was final as between the building-owner and the builder. Any question as between the building-owner and the architect would not be decided by that certificate. As between the building-owner and the builder the architect had, in the honest exercise of his judgment, awarded a sum which the building-owner could not question. As against the architect the building-owner could question that. The jury had found that the architect was negligent and that the architect had not awarded sufficient. The learned judge was satisfied with the verdict and a new trial could not be granted. Whether the Court would have arrived at the same verdict was not now the question. The other members of the Court of Appeal concurred in that view. The case opens out the possibilities of many novel actions, and it is evident that after the completion of a building and what appears to be a settlement, a building-owner can impugn an architect's judgment, and a jury may say that in an affair of deductions they are wiser and better informed than the architect.

It may now be laid down as a sort of legal maxim that any name found on a map or in an index to an atlas is unsuited for a trade-mark, unless the user has no objection to imitation by his rivals. The recent decisions in the Courts support our theory, and it is no wonder the ironmasters are in alarm about the value of many designations of brands. The latest illustration of the risk of having recourse to geographical or topographical titles is in the action brought by the well-established Rugby Portland Cement Company to prevent the use of the title "Rugby Portland" by another company. The suit has been going on since April, 1890. When it was heard before Mr. Justice Vaughan Williams, his lordship held that there was no evidence of infringement of the trade-mark as a whole, since the word "Rugby," as applied to cement, was known in the trade not as distinguishing the plaintiffs' goods, but as denoting the cement made of the stratum of blue lias existing in the Rugby district. The case was, therefore, dismissed. The plaintiffs appealed, and their counsel argued that, as neither the plaintiffs' nor the defendants' works were to be found in the town of Rugby, and as the plaintiffs had acquired a reputation for cement under the name of "Rugby Portland Cement," the defendants had no right to use the same name. If there was no intention to take advantage of the name by which the plaintiffs' cement was known in the trade, it was difficult to understand why the defendants should have taken again a title which their predecessors abandoned twelve years ago, and called themselves the Rugby and Newbold Cement Company? If Rugby cement was merely a term used to describe cement from the neighbourhood of Rugby, the defendants would have been equally entitled to use it when they were the Newbold Cement Company. But as it could not be proved that Rugby cement implied more than cement derived from Rugby, the Court of Appeal confirmed the former decision. The result will, no doubt, cause much inconvenience throughout the country, for a long employment of a term, and its acceptance by others, does not get over the objection which the Courts have for all words or phrases which relate to land or other things that are not the exclusive property of the user. The safest trade-mark is one which is specially devised, and is not to be found in a dictionary.

The makers of boxes for bon-bons in France will have to be careful about the subjects they select for the pictorial adornment of their productions. The law of copyright affects them. It might be supposed that artists would be glad to have their works popularised, but in France there is a craze about infringements of copyright at the present time. One of the latest cases relates to a picture *Les Infortunes de Pierrot*, by M. Loire. He authorised a firm of photographers to reproduce his painting and sell the photographs. Some were purchased by a firm engaged in the making of bon-bon boxes. The photographs were copied, and, according to custom, the copies were produced in colours on the boxes. The artist took action for invasion of copyright. While admitting the right to take monochrome copies, he objected to coloured copies and to the application of his work to confectioners' boxes. The first Court where the action was tried gave judgment in favour of M. Loire and awarded him 300 francs damages. The makers appealed, but the painter again was victorious. The decision is of importance to the trade, especially at a time when preparations are being made for getting up new year's gifts in France.

ANTOINE WATTEAU.*

THE indifference of the French people about the works of their countryman, ANTOINE WATTEAU, during more than a century, appears incomprehensible; it is, however, easily explained. At the beginning of the eighteenth century, as in the present time, the French cared only for pictures with which they could associate themselves. High art which produced the sculpturesque scenes of NICOLAS POUSSIN, the severe Carthusian series of LE SUEUR, the dramatic scripture pieces of JEAN JOUVENET, had in the hands of LEBRUN become one of the most effective means of puffing for a king who was the greatest of royal advertisers. The pageants which LEBRUN depicted with unquestionable power were accepted by the French as a glorification of their own greatness. As in the classic dramas, the figures might appear as Greeks and Romans, but everybody believed they were Frenchmen, and it was felt that a compliment was offered by identifying French with ancient heroes. When the Grand Monarque passed away there was a change, and it was no longer possible to find money for covering acres of canvas with representations of martial exploits. But the belief in the virtue of imitating the "great masters" still prevailed. The highest encomium that could be bestowed on a French artist was to associate his name with an Italian's. BLANCHARD was the "French TITIAN," BAUGIN the "little GUIDO;" MIGNARD was the Roman, so was LOUIS LENAIN, and LEBRUN the Arch-Roman. Under such circumstances, what chance of success awaited a painter like WATTEAU, who was not historically inclined nor nurtured among the faithful devotees of the "gusto grande?" The past was of no account to WATTEAU, and he was no less indifferent to the present as it was then exhibited in France. M. DARGENTY, in claiming for the painter the right to be considered as the founder of a school that is independent, original and gay, which nobody will contest, suggests that he also reflected better than others the French *esprit* and national character. The fate of WATTEAU is the surest evidence that among his contemporaries he was not credited with holding the mirror up to nature or character. His works were strange to the eyes of his countrymen. They were called by French titles, but they did not represent French scenes. Nobody who knows anything about the days of the Regency would venture to employ WATTEAU's charming scenes as illustrations of the manner in which life was enjoyed in the beginning of the eighteenth century. His *fêtes galantes* are of no age or country, and as Frenchmen unhappily ignore or undervalue all things they cannot claim, WATTEAU's fame has been slowly and grudgingly acknowledged. The painter of youth and beauty, and of a land in which it seems to be always a summer afternoon, has suffered because he made it a rule to avoid local characteristics.

But the absence of what is temporary and restricted has brought about compensation. The most ardent admirers of WATTEAU are probably to be found outside France. That the artist was a Frenchman is not denied, but, as became a man of his genius, he painted for humanity. His subjects are at home in all countries, and hence, as was remarked by THORÉ, England possesses ten times as many of WATTEAU's pictures as are to be discovered in all France. We find from the list attached to M. DARGENTY's book that in Paris there are two collectors of WATTEAU's works, viz. the Barons ALPHONSE and EDMOND DE ROTHSCHILD, while in London there are seven. In fact, so little value has been placed on the artist in France it needs some courage for a Frenchman to write about him, and what is said ought to be inspired by a penitential feeling of humiliation, for the ignorance displayed in connection with WATTEAU's works is discreditable to French connoisseurship.

In the course of his life WATTEAU was made to feel that even in France genius can be treated as if it were valueless. He was born in 1684 at Valenciennes, a town which, as THORÉ observes, is not far from Antwerp, for if WATTEAU owed allegiance to any master it was to RUBENS. Little is known about his family, except the entries afforded by the official registers, and from them it would appear that the father exercised a Wellerian liberty in spelling his name, which is put down as WATIAU, VUATEAU, WATEAU. The last corresponds with the artist's signature, but the world insists that the correct name is WATTEAU. The father of ANTOINE is supposed to have been a "couvreur," and may have used slates, tiles and thatch with like facility. It is open to everyone to assume that he was a poor man, who was eager to have the help of his son in roofing, or that he was a contractor who owned a corner house, but was avaricious, and for the sake of saving preferred to have his son at mechanical labour. Both theories have been proposed, and both rest on assertions. The usual legends are related about WATTEAU's precocity, and how he was able as a child to sketch groups in the market-place. It is probable he did display some power, as he was admitted into the atelier of a local artist named GÉRIN, who must have been forgotten if WATTEAU did not make his acquaintance. How long the two were associated and what was the character of the teaching cannot be discovered. It is believed that the death of the "couvreur" in 1702 brought about a change. According to one account, ANTOINE passed to a second master, most likely the scene-painter of the local theatre, by whom he was brought to Paris to assist in some decoration at the opera-house. On the completion of the work the master returned, and WATTEAU was left alone.

At the time he was stranded in Paris it may be assumed that WATTEAU was about twenty. It is impossible to estimate his competency; still, a young fellow of genius who had worked under a couple of masters must have been able to apply his hands to many kinds of work. It may be conjectured, however, that WATTEAU was diffident and wanting in confidence in himself. When most successful he could not believe that his works were valuable, and it is not going too far to suppose that in his first days in Paris he was not assured of his powers. Otherwise it is odd to find him seeking no better employment than the drudgery of aiding in the production of a class of pictures which served instead of the tawdry lithographs of our days. In one of the shops which stood on the Pont Notre-Dame there was a manufactory of that kind, in which the division of labour was acted on to an extent that would please an economist. Each assistant was allotted a part and a colour. One executed skies, another drapery, and so on; one hand laid on blue, to another white was entrusted, and in that way a dozen could co-operate. WATTEAU must have gone through the course many times, until he knew some of the figures by heart, and could manufacture at least one unaided. His emoluments were in cash three francs weekly and a plate of soup daily. An ordinary young fellow of his age would suffer tortures of many kinds, but it is to be hoped the magic of WATTEAU's imagination could turn his miseries into delights. He endured all stoically, but his delicate constitution could not withstand the strains of hunger, and his early death was no doubt caused by the trials of those days. Yet amidst all his misery he never neglected his studies as an artist. Art became to him a consoler, and made him indifferent about death. When Count CAYLUS, as became a prosperous gentleman, lectured him on his Bohemianism, he replied:—"Let the worst come, there is still the hospital; nobody is rejected from it." Yet this man appeared to be made for depicting scenes of refined pleasure in places where there was constant summer, and it might be inferred from his paintings that he lived the life of a sybarite. His case proves that what GOLDSMITH says of poets may be taken as applicable to painters—that is, if a man well fed can paint tolerably, after a course of starvation he will paint like a demigod.

The obscure and painful toil of WATTEAU came to an end. He was employed as assistant by GILLOT, a painter who, after trying bacchanalian, historical and sundry other subjects, was then tempting patrons by turning out Italian comedy-scenes. It was the opening of a new world for WATTEAU, and one that was in a way complete, for the characters were defined. He too, in course of time, presented harlequinades; but, after his manner, he also transfigured the actors, and placed them as inhabitants of the most charming of Arcadias. All went well with GILLOT and WATTEAU for a time, but it was the fate of the latter to be tossed about. The two friends separated, and, as

* *Les Artistes Célèbres: Antoine Watteau.* Par G. Dargenty. Paris: Librairie de l'Art.

happens with most events in Watteau's life, the cause remains unknown. The rupture is said to be due to the jealousy of Gillot, but that sort of charge is stereotyped in such cases.

Watteau was next taken in hand by Claude Audran, who, after decorating part of the Luxembourg, was made concierge at the building. The young artist was utilised in painting ornament, and, as Audran quickly perceived his value, he was well treated. Watteau was allowed time for study. He was enabled to copy pictures by Rubens, from which he derived inspiration, and in the gardens of the Luxembourg he found noble trees and delightful vistas. After so many trials Watteau was blessed with peace, and his association with Audran was probably the happiest time of his life. His aspirations were modest, and the Luxembourg must have appeared as an enchanted palace in his eyes. But there was to be no stability for him in any place. He painted a military scene in some of his spare hours, and submitted it to Audran. The ornamentist knew well that ordinary figure-pieces require a sort of skill that does not improve the style required in decoration, which should be more or less severe. He advised his assistant against continuing his experiments in easel-work. But Watteau concluded that he was being made a victim of selfishness, and, on the plea that he wished to visit Valenciennes, he gave up Audran's work. It is possible that Audran was thinking of his own interests in counselling his friend, and writers who treat of the case are opposed to his tactics. But it should be remembered that Audran was an ornamentist and judged as one, while, on the other hand, Watteau had not displayed skill unless as an assistant, and his most important work was putting in figures in connection with Audran's ornament. We have not Watteau's version of the story to guide us, but it is not unlikely that when he found there was no more for him to learn under a master he was eager to depart. He sold his picture for sixty francs, and with the aid of the money, the largest sum he possessed up to that period, he went to Valenciennes. There he painted a companion for which he was paid 100 francs. Unlike his later works the two are full of figures on a small scale. Watteau was not long in discovering that he was out of place in the northern town. He could not overcome his restlessness, and so he returned to his Paris garret as suddenly as he had withdrawn from it.

A new experience awaited him. There was a rich amateur in Paris named Crozat, who was possessed of many valuable pictures and studies. He had heard of Watteau and offered him board and residence in his mansion. The offer was accepted, and the collection was studied by Watteau with the eagerness of a man who knew that his opportunity was of brief duration. It was before Crozat's pictures that he acquired the style which gave value to his slightest work. When he derived from them the power he sought he naturally wished to exercise it, and as that was impossible under his patron's roof he resolved to retire. He completed the decorative work he had undertaken and then departed. Whether there were other causes cannot be discovered. Patronage can become oppressive, and the eloquence of amateurs is too often a punishment to the auditor. Watteau may have endured both and considered that liberty and poverty were preferable.

He is next heard of as a candidate for the Academy studentship in Rome. The subject for the year was biblical, and the strange notion came to Watteau to submit the two small pictures mentioned above instead of the prescribed work. They were left in the Academicians' room, and there attracted unexpected attention. Watteau was sent for, and to his surprise was informed by Delafosse, one of the painters, that the works demonstrated that he was qualified to be an Academician rather than a student, and if he complied with the requisite formalities he would be elected. In a brief time he became an Academician, and since the institution was founded no such election had taken place.

M. Dargenty and others consider there was something providential in Watteau's escape from the Roman school. There, it is supposed, he would have lost his natural gifts and become a nonentity, like so many who have tried to be a Michel Angelo without having a giant's powers. It seems to us that such a conclusion can only be made in forgetfulness of Watteau's character. He was no imitator, for he possessed the faculty to transform his models. The Kermesses of Rubens, which are full of animalism (unlike the scenes that still pass under the name and which are more doleful than funerals) became in Watteau's hand most refined scenes, such as we might imagine took place on the sward of lawns and opening glades of some princess's academy in the intervals of discussion on "all that treats of whatsoever is." The Italian buffoons which he aided Gillot to depict were converted into as fine gentlemen as could be found about a court. The Luxembourg trees grew to woods at his command, and the gutters of Paris were turned into crystal streams. A comparison of Watteau's drawings, in which it was requisite to be exact, with the painter's finished works, will reveal the power of his idealising process. It was no doubt from a study of Watteau's feats in converting the prose of life into poetry that Louis Viardot was induced to regret "that the artist did not consecrate his talents *de plus hauts sujets*," and there is an unworldliness in his paintings which is only to be found in the scripture pieces of the great masters. If, in a word, Watteau could draw from Rubens qualities which would not be generally ascribed to that painter, might he not be as successful with Rubens's inspirer, Michel Angelo? There is, however, some excuse for the French critics. Every year they see most promising students wrecked after a voyage to Rome, and it is not blameable if they believe that a genius like Watteau would not be proof against the dangers of the official system.

His election to the Academy at once convinced people that Watteau was possessed of extraordinary ability. Urgent requests were made for his pictures and his society was sought. But there was no change in the artist. His youth seemed to have passed away during his slavery in the booth on the Pont Notre-Dame, and he looked on himself as a man who was in reality only worth three francs a week. Perhaps, too, his mind was clouded by the apprehension of an early death. He acted as if he had no right to rest. He tried the experiment of living with various friends, but everywhere the impulse of flight came upon him, and it was irresistible, as it is still with others. He crossed over to England in 1720, but failed to settle down among us, and he returned to Paris the next year with an aggravation of his lung disease. It is said, too, that he brought with him a love of money which hitherto was indifferent to him, but as he died on July 18, 1721, it is not plain how he could have displayed any signs of avarice.

The paintings of Watteau are the productions of an invalid, and we may presume that they express his aspirations after modes of enjoyment to which he was a stranger. Looked at in that way they become the saddest of works. The lonely, unquiet, consumptive artist longed to have warmth, sunshine, repose, the company of friends, music and song, and his pictures are more expressive of his needs than the most eloquent poetry. Whatever he might appear to his friends, in spirit he was the gentle stoic who could look on the hospital and the grave without fear. He would not leave the world without endowing it with visions of beauty which are worthy to be set beside the great works of Titian. He made no tragedy out of his own sufferings, but like some pitying angel suggested a time when, if men would come to be in harmony with nature, the world would be again a Paradise. Anacharsis Clootz himself could not in his dreams of universal love a few years later surpass the scenes of happiness, which came from the blanched hand of Watteau, but which are unfortunately as far as ever from realisation off the stage.

The parts of the series "Artistes Célèbres" are abundantly illustrated, but in M. Dargenty's book the plates are more numerous than in any of its predecessors. Many are taken from rare drawings by Watteau, which are produced in excellent style.

THE ROYAL SCOTTISH ACADEMY.

THE sixty-fourth annual report of the Council of the Royal Scottish Academy runs as follows:—The sixty-fifth exhibition was opened on Saturday, February 14, and was closed on Saturday, May 23. It contained 773 paintings in oil and water-colour, 41 works in sculpture, 32 architectural drawings and a number of etchings. The annual dinner took place in the Galleries as usual on the eve of the public opening of the

exhibition, when the President and Council had the pleasure of receiving a large and distinguished company. The vacancies in the rank of Academicians will require to be filled up at the general assembly of the Academy in January, and in March next the Academy will be called upon to elect associates to the number which may be determined by the general assembly of Academicians.

Librarian's Report.

The following is the report of the librarian and the curators of the library :—"The books, prints and drawings are in good order and catalogued up to date. The aggregate attendance of members has been fully maintained, but that of the students has considerably fallen off. Besides the addition of the leading British and French art periodicals and the Arundel Society publications for the past year, the following works have been added to the library :—Retzsch's 'Outlines to Shakespeare,' original edition. First series, 'Hamlet,' seventeen plates, folio, 1828; second series, 'Macbeth,' folio, 1833; third series, 'Romeo and Juliet,' thirteen plates, folio, 1836; fourth series, 'King Lear,' thirteen plates, folio, 1838; fifth series, 'The Tempest,' thirteen plates, oblong folio, 1841—presented by John Hutchison, R.S.A. 'Croquis Militaires,' par A. de Neuville, twenty plates, large folio—presented by Otto Leyde, R.S.A. (Signed) Otto Leyde, librarian; William Hole, curator; Robert M'Gregor, curator."

Life School.

The visitors of the Life School report as follows :—"The session of 1890-91 commenced on November 3 and ended on June 27, 1890, having had 124 morning and 125 evening meetings. The aggregate morning attendance was 1,622, and the aggregate evening attendance 1,550, giving an average attendance at each meeting of 13 in the morning and 12 in the evening. During the session 10 students retired and 6 were admitted. Notwithstanding the large number of senior students who retired in accordance with the rules, the school continues to show satisfactory progress and vitality. The work of the students is now submitted to the Council, and the Visitors have nothing further to add except to express their satisfaction with the general conduct of the students during the session. (Signed) J. Lawton Wingate, visitor; R. M'Gregor, visitor; D. W. Stevenson, visitor; William Hole, visitor." The Council are pleased to recognise the marked ability shown in many of the studies in oil, but they would call attention to the necessity for greater thoroughness and delicacy of perception of form in the drawings. Further, they regret that they have again had to withhold the Stuart prize, partly on the same grounds given last year, viz. that in the special qualities desiderated—composition and design—the competitors are sadly deficient, and also on account of excessive carelessness in the delineation of the figure. After a careful examination of the studies, the Council awarded the prizes as follows :—The Chalmers Bursary, Alex. Coutts Fraser; extra prize for painting, James Riddel; the Chalmers-Jervise Prize for the best drawing from the life, P. P. Mackie; Maclaine-Watters Medal, James Riddel; the Keith Prize for the best work by a student in this year's exhibition, John C. Mitchell and David M. Smith, equal. Mr. J. Mitchell and Mr. G. Shand receive honourable mention for merit in painting, and Mr. A. C. Fraser for drawing. The Council have to report that, in accordance with the resolution of the general meeting of February 25 last, Mr. Hole, R.S.A., delivered a short series of lectures on Pictorial Composition to the students of the Life School and others, which were well attended.

Donations, Bequests, &c.

The Council report that the munificent bequest made to the Academy by the late James Nasmyth, of Hammerfield, Penshurst, Kent, to form a fund, to be named the Alexander Nasmyth Fund, for the benefit of decayed Scottish artists, has partly, in terms of the will, been paid to the Academy, and, in accordance with laws framed for its administration, relief has been afforded to a number of applicants. The Council have also to report the presentation to the Academy by Mr. James Orrock, R.I., London, of a number of interesting and valuable water-colour drawings illustrating the rise and progress of the art in England. The drawings, fifteen in number, include examples of P. de Wint, David Cox, William Hunt, Bonnington, Cattermole and others. The Council have further to acknowledge the gift to the Academy by Sir J. D. Linton, P.R.I., of three of the original sketches in oil by William Etty, R.A., for his great work, *Judith and Holofernes*, belonging to the Academy, and now in the National Gallery of Scotland. Along with these sketches Sir J. D. Linton also presented a copy by William Etty, R.A., of a figure in one of the pictures of the Marie de Medici series by Rubens, now in the Louvre, Paris.

Deceased Members.

The Council regret having to record the breaks which death has made in the ranks of the Academy during the past year. One honorary member, Mr. W. Bell Scott; one associate, Mr. Keeley Halswelle; and three Academicians, Mr. John Dick Peddie, Sir William Fettes Douglas, the president, and Sir John Steell having died since the general meeting in November last. Short obituary notices of these gentlemen are given in the report.

The New President.

Pursuant to the resolution of the Academy, a general meeting was held on August 8 to elect a successor to Sir William Fettes Douglas, and Mr. George Reid, R.S.A., was unanimously elected president of the Academy; and, as in previous cases, the secretary, in acknowledging the receipt of Her Majesty's gracious reply to the intimation of the death of Sir William Fettes Douglas, communicated the election of Mr. Reid as his successor.

The Academy's Schools.

It has long been felt by the members of the Academy that the arrangements of the Treasury minute of 1858 have limited the action of the Academy in regard to teaching. This may not, however, have been known by the general public, and it is with great satisfaction that the Council notice the decision of the Secretary for Scotland, just received, annulling the above arrangements and granting to the Academy greater freedom in the management of its school.

The New Charter.

It is with great pleasure that the Council, before closing this report, refer to the granting by Her Majesty of the supplementary charter of the Academy which has for some time been under consideration by the Privy Council, and would express the hope that as under the new charter many hampering conditions have been removed, a liberal interpretation of its provisions may be given by the Academy, so that not only the Academy itself and the artistic profession generally but art in Scotland may receive a fresh impetus, and continue to advance in even a greater degree than it has done in the past.

Office-bearers.

Office-bearers were elected and the Council declared for the ensuing year, as follows :—Council : George Reid (president), W. D. M'Kay, John Hutchison (succeeded the late J. Dick Peddie in terms of the laws), J. B. M'Donald, W. Beattie-Brown, John Smart, J. Lawton Wingate, George Hay (secretary) and John Hutchison (treasurer); W. D. M'Kay and W. Beattie-Brown, auditors; Otto T. Leyde, librarian; John Hutchison and John Smart, curators of library; D. W. Stevenson, William Hole, Robert M'Gregor and Robert Alexander, visitors of life school; Clark Stanton, curator of life school.

[It may be explained that under the Treasury minute of February 25, 1858, an arrangement was made that the classes for the antique should be under the charge of the Board of Manufactures, and that the life school should be under the control of the Royal Scottish Academy, and that neither, in these respects, should trench on the profits of the other. This has now been abolished. The Board of Manufactures have recently opened a life class, and the Royal Scottish Academy will now be at liberty to have classes for their own students for the study of the antique.]

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. J. MacVicar Anderson, president, in the chair. At the conclusion of the business meeting at 8.40, a paper was read by Mr. H. Favarger :—

The Building of "Mena House."

Mr. FAVARGER, in his introductory remarks, referred to the common belief that there were only two or three Pyramids in Egypt, whereas about forty were now visible. When the Suez Canal was opened the Khedive Ismail had a road made to the Pyramids of Gizeh and two houses built, one on each side of the road. The one on the lower ground, to the north of the monument, was sold by the present Khedive, and, being eventually purchased by an English capitalist, formed the central point round which had been grouped the various buildings forming the hotel known as "Mena House."

Towards the end of 1888 Mr. Favarger was commissioned to add a dining-room and more bedrooms, and in May 1889 some fifty other bedrooms and reception-rooms were to be added. Plans were prepared and tenders invited from contractors in Cairo for the small amount of work first decided upon, but the prices seemed so high that it was determined to engage native workmen and make them work under supervision. A young Swiss who had had some experience of building in Egypt was engaged as clerk of the works, and the work commenced. The stone for the rubble-masonry walls was taken from a large unfinished building which was built of stone and mud. The larger work in the following spring necessitated the collection of a stock of stone, and permission was obtained to use the *débris* of stone around the Pyramids. Erroneous state-

ments had been made that the Pyramids were being stripped of their casing to enable the hotel to be built, and the author took the opportunity to explain the actual facts. The Museum authorities, under whose control all the old Egyptian monuments were, refused to allow a single workman near the Pyramids, but employed their own men to clear away the rubble from certain points that interested them, and after it had been searched for inscriptions certain portions were allowed to be taken away, an arrangement which gave absolute security that the monuments would not be injured. When making the greater additions to the house it was decided that they should be at right angles to the old building, and their southern face become the main frontage. A carriage-drive from the road led to the main steps, and passing through a large wooden verandah the visitor reached the entrance leading into an antechamber and then to the hall, with the staircase some distance off. The drawing-rooms faced east and the library south, while westward was the staircase, placed so as to serve, with its alternate landings, the several floors, first to the east and then to the west. The billiard-room was built outside the house, top-lighted, and connected with the card-room by arches in the main wall. Moule's earth-closets were used, but in a separate block from the house, approached on each floor by a roofed bridge opening out of the lavatories. The bedrooms were divided into tiers of three, each tier being half a flight higher than its neighbour, with the English single-leaf door instead of the French double door. The foundations of the building gave little difficulty, the dry sand of the desert forming a basis almost equal to solid rock. The elevation was simple, and the labour being only Arab, rubble ashlar, unplastered, was selected, as being the nearest to the usual native style of work. While these works were in progress stables were erected on the opposite side of the Cairo road, which could accommodate over one hundred and fifty animals, and a large open-air swimming-bath and a steam laundry were constructed. A matter of serious importance also claimed attention, namely, the water-supply. After careful consideration and three boring trials, which were described by the author, the fact was proved that water could be found on the edge of the desert in large quantities and of great purity. It was found, however, that if an abundant supply of water was to be depended upon a well was absolutely necessary; and a design was prepared, which consisted of a 13-inch brick wall, built on a circular iron curb of 8 feet internal and 10 feet external diameter. The author described the construction of the well in detail, and a daily record of the work was given.

In 1890 further additions were decided on; among them a house to serve as an estate office, and eventually as an annexe to the hotel. This was built of sun-dried bricks, such as used by the natives in the construction of their huts, and consisted of six rooms on the ground-floor, with eight bedrooms and offices above. A secure foundation of rubble masonry was carried up 3 feet above the ground, to secure the base from injury by surface-water, and on that were built the walls of the first storey, to the thickness of nearly 3 feet. The settlement of the house was considerable, but so even that the only harm was that the plastering of the wall came down, and had to be replaced when the walls were thoroughly dry. In the design of the dining-hall the eastern Saracenic architecture was adapted to modern requirements. The hall was to be a feature of attraction, and, while providing with comfort for about 100 persons, was to be capable of accommodating 250 persons. Two levels, therefore, were given to the room, the main room having a raised corridor round it, similar to the Holborn Restaurant, which gave great scope for the introduction of arches. The four principal arches of the main room formed the special feature of the hall. The south arch was a copy of the principal arch in the beautiful mosque of Kait Bey; the northern arch differed somewhat, although its leading dimensions were identical. Other details of the hall were then given by the author, who proceeded also to describe the vestibule and the roofs, and then turned to the various styles of building in Egypt. Firstly, the mud buildings, which were constructed of mud bricks dried in the sun, the binding material being also mud. The work was done with as little moisture as possible, and made a warm, comfortable house, and the settlement, though considerable, was even. Secondly, stone and mud building, which was a favourite method with the Arabs in districts where fuel for making lime was not easily to be obtained; and it was surprising how long such buildings lasted in Egypt. Thirdly, rubble-ashlar buildings of stone and lime, with courses of bricks every 2 feet, to give a fresh level to the work, and equalise the pressure on the walls. Having dealt with the qualities of limestones, lime, sand, timber and other materials to be obtained in Egypt, Mr. Favarger turned to the question of labour. The workmen were almost entirely Arabs, directed by European foremen, and he remarked that it was curious, although Greek, Italian, Maltese, Turkish, French and German artisans were employed, not a single English craftsman offered his services during the building at Mena House. Among the Arabs a few clever and intelligent masons and carpenters were to be met with, but the majority were indolent and ignorant, and difficult to deal with. For rough labour the Arab was not unsuitable, properly supervised. The children, both girls and boys, were extremely quick and strong. Of plumbers there was a sad lack, and the Maltese who did the work had almost to be taught how to use his tools. Blacksmiths and engineers were fairly intelligent, and were generally Italians or Germans. That good work could be done, however, was evident by Mena House being an accomplished fact, but it was hardly credible the amount of supervision which was necessary. The whole building ought to be considered as the result of a race against time, varied by a scrimmage with constant difficulties, rather than the embodiment of carefully-digested plans; and the hearty co-operation of those connected with the building operations contributed in no small measure to the final result.

Mr. R. Phené Spiers, F.S.A., proposed a vote of thanks to Mr. Favarger for his paper. He said he was not acquainted with the modern work done in Egypt. Those who heard this paper, and who had heard the paper read to them two years ago, would, he thought, have perceived a similarity with much that Mr. Favarger had told them. In regard of scaffolding, the use of inclined planes of planks instead of ladders struck him forcibly in connection with the construction of the Pyramids, where ten years were expended in making a causeway to roll up material. Most likely the enormous masses were handled in a very simple way by aid of inclined planes. It was a singular fact, as mentioned by Mr. Favarger, that the railway was not at all in accordance with the customs of the inhabitants. He remembered the astonishing work of boys and girls employed in carrying material for the railway, and how rapidly the mounds of material grew. A point also that struck him particularly was the beauty of the brick arches above stonework. He would like to know the size of the bricks used. In conclusion, he thought there was no better way of illustrating a paper than by use of lantern and slides, as Mr. Favarger had done.

Mr. Thomas Henry seconded the vote. Alluding to a climate where the temperature was between 90° and 100°, he said the comforts at the Mena Hotel could hardly be understood unless experienced. In Cairo it was hardly possible to have any appetite. Sitting down in the sumptuous dining-hall at Mena restored the appetite. Sleep was insured, and he would return to Cairo thoroughly refreshed. He had never been in a more beautiful dining-hall or a building more suited to the circumstances of the country in which it was built. He did not know any hotel in tropical parts so admirably suited for its purposes. Every comfort was provided, and also amusement, shops, tennis-grounds, racecourse, &c., and a capital stud of horses.

The President had not examined the plans, so as to speak of the planning of the building. Of the architecture, as shown by the slides, it was difficult to speak, because the buildings did not appear to possess much architecture. Great simplicity had to be attended to, and Mr. Favarger had succeeded in attaining that result. The President then put the vote, and it was carried by acclamation.

Mr. Favarger, in reply, said the Arabs always preferred manual labour to wheels for carrying material. The bricks were smaller than English bricks, the approximate size being 2 by 4 by 6. Mud bricks were 3 by 5½ by 10. Some mud bricks were even four times that size, but they were really blocks rather than bricks.

The meeting then adjourned.

TESSERÆ.

Ancient and Modern Sculpture.

In some important respects there is now no common catholic standard whereby the various modern schools of sculpture can be gauged. Broadly stated, of course nature should be this standard, but all who have studied art and know its requirements are sensible of the importance of considering how far, or rather under what aspect, nature is to be the artist's guide, a remark that applies especially to sculpture. In the history of art the function of the highest class of sculpture known to us was to interest and incite the loftier feelings of those to whom it was addressed by representing sublime and noble subjects under the most perfect forms. It is admitted by all competent judges that this union or combination of the most elevated motive with the most perfect physical beauty as its exponent has been thoroughly achieved by one people only, the Greeks, and it is on their best sculpture, in which these two elements are found combined, that all sound criticism on this art has been based. This is not to place Greek or any other art before or in antagonism with nature. Art is nature seen through the medium of mind and refined taste.

Mezzotint Engraving.

The generally received opinion as to Prince Rupert being the inventor of the mezzotint engraving is erroneous. It appears that the person to whom the merit of the invention is

due is Louis von Siegen (or L. à Siegen), a lieutenant-colonel in the service of the Landgrave of Hesse-Cassel. The works of this amateur artist are of considerable rarity, and it is not improbable that they were merely distributed among his friends and patrons. Baron Heineken, in his "Idée Générale d'une Collection complette d'Estampes," printed at Leipsic in 1771, says decidedly that Siegen was the inventor of mezzotint engraving, and observes that the first specimen which appeared was the portrait of the Princess Amelia, Landgravine of Hesse; he adds that Prince Rupert learnt the art from Siegen, and that eventually it became public. In Grainger's "Biographical History of England" we find the following observations on the invention of this style of engraving:—"It should not be forgotten that Sir Christopher Wren is said to have been the inventor of mezzotint. It is certain there is a blackamoor's head by him in a different manner to that of Prince Rupert; also Vertue, in a manuscript in my possession, mentions a large head, something like mezzotint, of the Princess Amelia of Hesse thus inscribed:—'Ad vivum à se primùm depictam, novoque jam sculpturæ modo expressam, dicat consecratque L. à S. anno 1643.' Mr. Wanley says there is one of this lady in Lord Harley's collection of heads, also one of the Comes of Hesse by the same hand, who was the person who taught Prince Rupert." Mr. Lodge, in his life of that Prince contained in his "Portraits of Illustrious Persons," after mentioning the Prince's contributions to science and various discoveries, says:—"But the discovery which we find most frequently associated with his name is of the art of engraving in mezzotint, the first hint of which is said to have occurred to him from observing the effect accidentally produced by a soldier scraping some rust off the barrel of his musket. His right, however, to the strict reputation of inventor has been somewhat questioned, but with little probability." It will be seen by this that Heineken's authority is doubted; but Mr. Strutt, in his "Biographical Dictionary of Engravers," although more cautious, is nevertheless in doubt on the subject, for he says, after noticing the story of Prince Rupert's observing the soldier scrape the rust from his musket:—"If the account, as given by Baron Heineken, be allowed as authentic, and it bears every appearance of being true, especially if such a portrait really exists, then the probability of the first story is entirely destroyed. I must leave the reader, however, to decide, having given him all the information I could obtain on the subject." Huber, the compiler of Winckler's Catalogue, tells us that Theodore Caspar de Fürstenbergh, a capitulary canon of Mayence, was an engraver in mezzotint; that his works are cotemporary with those of Siegen, and expresses a doubt as to which was the disciple of the other, adding if Fürstenbergh learnt the art of Siegen he excelled his master. But there is no evidence whatever to warrant this doubt; on the contrary, a mezzotint portrait of the Queen of Bohemia bears the date of 1643, whilst the earliest known specimen of Fürstenbergh is dated 1656. It is only necessary to add that Rupert's earliest effort in mezzotint (though etchings of this Prince are earlier, and one is known inscribed "Rup. Pr. 1637") is of the year 1658.

Chinese Houses.

In building a Chinese house of the common sort there are no extensive lines of foundations to be laid, such as are formed for building European houses. A course or two of bricks about a foot and a half square is first laid; on this a square tile is placed to support a round stone of sufficient width to correspond with the thickness of the timber used, and to serve as a base for the support of the upright pillars of the framework, and to keep the wood from contact with the damp earth. There is often no attempt at concealing these beams by masonry in building up the intervals between the parts, so as to form side walls or partitions; on the contrary, the exposed pillars are so numerous that they present a striking feature in the interior of Chinese houses. The side walls are built up very expeditiously by laying a single course of bricks, or by arranging the brickwork in the form of a hollow wall; in the latter instances flat bricks are used and bonded accordingly. This mode is generally adopted in forming the outer walls of buildings or of courtyards, consequently they are hollow and wanting in strength. The former method is employed in making partition, and corresponds with our Flemish bonding. The partition is strengthened considerably by a layer of lime mortar, mixed with coarse fibres of a paper made for this special purpose, and prepared from the fibres of the jute, bamboo, and other coarse fibre-producing plants. This paper is torn up into small pieces and thrown into the fresh slaked lime, and thoroughly mixed, so as to become a sort of pulp. From this it is readily seen how few bricks are required to build a Chinese house, and with what celerity it may be constructed. The upright pillars of the framework support the horizontal connecting beams; on these rafters are laid, so close as to sustain a layer of flat tiles. Over these a course of curved tiles are laid, after the fashion of ordinary tile-roofing in Europe. In the central and southern parts of China no ceilings are used, so that there is plenty of natural ventilation. This renders the house very cold in winter. Leakage is very liable to occur, and the flat tiles often fall, and sometimes do severe injury. The more northern houses are more comfortable, and better adapted to a cold climate; they have ceilings of paper, and the roof is laid on a thick layer of reeds. The roofs of Chinese houses are always completed before the side walls are commenced, and thus present a most anomalous appearance while being constructed. They generally project over the side walls, so as to form a verandah or eave to shade from the sun, or to throw off the rain from the walls more effectually. In such cases the outlines of the roof present a graceful curve; and a curved line being often found in the outline of the upper ridge of the roof, which is generally terminated at each of its extremities by ornamental projections, no doubt gave rise to the supposition that the Chinese derived the design of their houses from the form of a tent; but a little examination will show that the curve or dip in the roof, not always present, is mainly due to accident in forming the framework of the roof, and to a matter of taste in ornament, the object being to hide the monotonous straight line the ridge of the roof would otherwise present, its presence being unconnected with the plan of the structure. The form of the gourd is sometimes observed to surmount the pinnacle of a high central roof in a group of buildings; it is an emblematic form, and indicates longevity. The old story of the elixir vitæ being kept in one of these gourd bottles has some bearing on this point.

Italian Majolica.

The principles upon which this manufacture is based consist in painting with metallic colours upon a biscuit, which, being naturally coloured, is, first of all, whitened by means of a thin layer of a hard stanniferous preparation; then, after the completion of the painting, it receives a thin smear of transparent glaze, so that the painting is placed between two layers of vitreous composition, the stanniferous preparation being the harder of the two. The degree of heat necessary to vitrify the whole has to be regulated with the greatest care, because if too low the painting will appear hard, dry and deficient in richness of tone; if too high, the colours lose their strength and brilliancy. The point to be attained is when, without losing their force, the colours are sufficiently fused to blend slightly one into the other, and remove all hardness of outline. As this process requires so much manipulative skill and tact, the natural endeavour amongst manufacturers was, as soon as they were acquainted with a way of making an enamel at once opaque and soft, to coat their biscuit with this single preparation, and so realise their aim to a nearer approach to porcelain. But then this occurs, that in increasing the opacity of the enamel the richness and vigour of the colouring are lost. It is only necessary to compare a piece of early majolica, of Faenza more especially, with those of a later period, to be convinced of this; it will be at once apparent that the richness of the tints is in inverse proportion to the amount of tin mixed in the enamel, or, in other words, to the opacity. Hence a reason why from the second part of the seventeenth century the Italian majolica-ware was already but a pale reflection of its predecessors, that in Holland they should produce what we call delft-ware, and more especially faïence in France.

St. Mary's Church, Guildford.

St. Mary's Church is an ancient building, the architecture of which is a compound of the Norman and Pointed styles; the former predominant in the detail and ornaments, the latter in the arches and windows of the structure. It consists of a nave and aisles, and a chancel, separated from the nave by a tower, and flanked by two chapels, so that the church may be described as in two portions: the whole of the eastern part, comprising the chancel and chapels, is raised above the other portion, in consequence of the church being erected upon the slope of a hill. The chapels are likewise each composed of two portions answering to nave and chancel, the latter being semicircular in plan, and separated from the former by an arch. The southern chapel still contains a screen of oak, which formerly constituted the back of the altar; it retains traces of colour, and a portion of the carving, and is now improperly termed a confessional. The northern chapel has its chancel, a semicircular portion vaulted in three divisions; the ribs are stone, and the spandrils probably chalk. On the face of the vaulting, and on the spandrils of the arch which divides this portion of the chapel from its nave, are depicted the subjects here described. The seven subjects first described are depicted upon the soffit of the vault. An oval compartment in the centre bears a representation of the Godhead seated; his right hand raised in the attitude of benediction, the left sustaining a book or table, inscribed with the letters Alpha and Omega. The remaining subjects are upon the spaces intervening between the ribs of the vault, and occur in the following order, beginning from the south side:—1. Represents Christ passing Judgment. Before him a pardoned man kneeling in prayer, behind whom are two others dragged to judgment by demons. 2. A figure of Christ, before whom is a person placed within a font in a supplicating posture; a third

figure is represented drawing water from a river by two buckets. 3. Earthly Judgment, represented in a group of five figures. A king seated, the accuser and witness standing, and a culprit suffering decapitation. 4. Heavenly Judgment. Several good souls represented as received into the bosom of our Saviour; a bad man condemned to torment, which he is suffering in a tub-like receptacle from a figure armed with a flesh-hook. 5. The Death of the Wicked. A judge standing, holding a wand or rod; a scribe seated at a desk registering the sentence. Two figures extended dead upon the floor; a third drinking from a chalice. 6. The Death of the Good. The least defaced of all the subjects. It represents a corpse placed upon the ground attended by two priests; in the background an altar, upon which is placed a chalice; above, the hand of Providence issuing from the clouds. These six subjects are in circular compartments, the remainder of the soffit being filled with ornamental foliage, and two angels with censers, so placed as to appear on each side of the figure of the Deity first described. In the spandril to the right hand of the altar an angel is represented weighing in scales the good and evil actions of a soul, the body belonging to which is represented below in a supplicating posture, the enemy of mankind placing his foot upon the evil scale. The corresponding spandril, considerably defaced, exhibits the departure of the damned, who are dragged away by demons, and driven by an angel with a sword. These subjects are on the face of the wall immediately over the opening to the semicircular chancel, and consequently face the nave of the chapel. The ribs of the vault and the architrave of the arch are painted in various patterns. Mr. Carlos considers these paintings as belonging to the close of the twelfth century, and that they are coeval with the structure which contains them. The existence of these paintings, he observes, is not even noticed in any work relating to the history either of the county or town. It is probable that the whole had been, at some time, covered with a coat of whitewash which concealed them from observation, which may account for the omission. It is not known, he adds, to what saint either of the chapels was dedicated; but it appears that two guilds or fraternities existed here in the fifteenth century, one of which was the fraternity of Jesus, the other that of Corpus Christi, and there was also a chapel of St. John in some part of the present church.

Burgos Cathedral.

The cathedral of Burgos taken as a whole, interior and exterior, has been considered one of the finest examples of Gothic architecture in the world. It is not surpassed by the cathedrals of France and England, though it has the fault of Spanish cathedrals of the nave being too blocked up by the coro, and the capella major, or great altar, too encumbered with chapels, making the interior somewhat heavy. Over the crucero, the intersection of the nave and transept, is an octagonal tower or cimborio, of surpassing beauty and of interest as a rare example of the passage of the Gothic to the Renaissance, which for the most part is decided, presenting scarcely any instances of the mingling of these apparently incompatible styles. There can be no question that it is of much earlier date than that given in the account of the cathedral, 1560. It is believed to be a work of the end of the reigns of Ferdinand and Isabella; it is certainly not later than the earliest part of the sixteenth century. The western façade of Burgos Cathedral, surmounted by its two pyramidal spires of open tracery, dating from 1442, is of great celebrity. But as for the interior the cathedral of Seville is the finest Gothic construction in Spain. It is one of the later cathedrals—date 1400—which renders it the more singular that its author should be utterly unknown. It is a favourite theme with the Spanish pseudo-poets to address lines to the mystic hands that raised this solemn fane, upon which they look with an awe somewhat akin to that of the wanderers in the desert on the mighty remains of Persepolis or Baalbec. This magnificent structure has five naves of nearly equal breadth. The form approaches a square, the breadth being very great in proportion to the length, and the side aisles are all equal and nearly of the same height as the centre. The capitals of the columns are of the same elevation throughout and the piers of similar dimensions to each other. It has thus that element of symmetry which is characteristic of Grecian architecture and in which the Gothic is generally considered as wanting. From this plan and the great solidity of the piers the exterior is wholly without the connecting arches and buttresses, which in most of our cathedrals support the inner parts of the fabric and supply the want of internal strength. The trascoro has a beautiful and costly architectural front of red marble of Moron. It is, however, out of keeping with the architecture of the cathedral. With the exception of the great western porch, which is fine and in keeping, the exterior of the cathedral is singularly unfortunate. It is an inextricable jumble of forms, which can scarcely be referred to any style, or it includes all styles—the beautiful tower of the Giralda representing the Moorish—and is the more remarkable as the accompaniment of the finest interior in existence. In the clerestory there are the most brilliant and finest specimens of painted glass, admirable in itself and its mode of introduction, adding greatly to the marvellous effect of this matchless cathedral.

Canons of Sculpture.

In the best ancient schools there were certain laws to which artists were obliged to conform, and in many particulars even the "treatment" of the sculpture was confined within prescribed limits. First, from the most archaic period down to the perfection of the art in the fifth century B.C. the subjects and motive of sculpture in all nations were regulated by strict religious influences. The dignity of art was preserved, and no opportunity permitted for the introduction of any element of vulgarity or of commonplace. And, secondly, when at the date referred to sculpture had reached its highest excellence the great principle was established that the conceptions of the sculptor should, as a rule, have their outward expression in the most perfect physical forms, a noble and profoundly philosophical idea that the good in sentiment should have its expression in the beautiful. These forms would of course vary according to the fitness of the particular type to express the idea or thing signified, and yet each and all might still be of the very highest beauty, nature in her normal and most perfect aspect being taken as the true standard of imitation. Thus, for instance, the appropriate representation of a *Mercury* or a *Hercules* would both be sought for in the utmost perfection of the human form, while yet the forms themselves might, and indeed necessarily would, exhibit a marked difference as to class and character. So in the idea intended to be conveyed in a statue of *Jupiter* or *Apollo*, of a *Mars* or *Cupid*, a *Juno* and a *Venus*, and others of an equally widely contrasted individuality, the forms would be perfect of their kind, although they would differ essentially in character. Judged from so simple a point of view, ancient sculpture is therefore brought within easier conditions for estimating its merits than can be the case when the art is practised under less strict observances, and indeed only according to the fancy or caprice of the sculptor or of the age and people for whom he labours. Sculpture being essentially and wholly an art of form the real question is, whether the forms employed are to be of a high, the highest, type of excellence, or whether, assuming, as some do, that the whole and sole function of art is imitation, these forms may be of a commonplace character as they occur in ordinary circumstances where the normal and original perfection of nature may have suffered deterioration from accidental causes, as labour, climate, sickness, old age or any other disturbance to which humanity is liable.

Fresco Painting.

"Buon fresco," that pictorial process by which the greatest effects of artistic genius have been realised—the stanze of the Vatican and the ceiling of the Sistine Chapel, for instance—has a peculiar property of its own, which eminently distinguishes it from all other methods of painting. It is this, that a fresco is a non-absorbent of light. The fresco ground is composed of certain proportions of lime from which the heating element has been to a great extent washed out) and sand, and this mixture is used by the painter in its moist state. The wet lime, absorbing carbon from the atmosphere, becomes carbonate of lime, and in combination with the sand, produces an impermeable cement, which is formed over the surface of the ground during the day's work, and in which the colour used is incorporated and fixed. A fresco-painter can only proceed with small portions of his work at the same time. A fresco in progress is like a child's dissected map, made up of pieces of all shapes and sizes, which are joined together day by day. The cemented surface has been stated to be sufficiently crystalline to reflect light. But, whether this is so or not, its non-absorbency of light is unquestionable. It will thus be readily understood how eminently fitted fresco-painting is for mural decoration—especially for churches and public buildings, generally imperfectly lighted, and which are positively made lighter by fresco decoration. Where an oil picture would be invisible a fresco is clearly seen. All other processes for wall-painting, such as water-glass and wax, suffer greatly in comparison with real fresco; but, unfortunately, this beautiful material is much affected by climatic influence, as may be seen in the condition of the frescoes in the Palace at Westminster—a condition almost entirely produced by the bad air of that locality, vitiated as it is by exhalations and impurities of all kinds. It is, however, earnestly to be hoped that the rising generation of artists may be encouraged to try the effect of this beautiful material in places where, with proper care and attention, it might be proof against the humidity of our climate. As in the spandrils of the nave arcade of many a country church you find texts upon the wall to arrest and instruct the wandering eye and mind, so might frescoes be introduced illustrating the great facts of sacred history. Mural painting might with excellent effect be introduced into schoolrooms and the halls and corridors of great houses. It is only in our "flourishing peopled towns," where gaseous impurities hold their sway, that "buon fresco" has but a brief existence.

NOTES AND COMMENTS.

THERE is a chance that archæology will be studied in Oxford with the thoroughness it receives in Germany and France, since it is proposed to create a Central Museum of Art and Archæology in connection with the University. The Ashmolean Museum and University Galleries would form parts of it. The new project is mainly the conception of Mr. C. D. E. FORTNUM, who has done much for the enrichment of the galleries. He proposes, subject to a small life annuity, to hand over at once 10,000*l.* towards the new museum, and at the same time announces that he has bequeathed the rest of his collections, which are of unique value, together with his considerable archæological library, to the University. In return, he asks that the scheme for erecting and adequately endowing the new museum should be carried out at once, and that the whole of the art and archæological collections shall be placed in juxtaposition and under a single governing body. Many other offers of assistance have been received, and apparently there will be no financial difficulties to prevent the completion of the scheme. Of course, much more is contemplated than the building of a museum. The collections will be made useful in imparting new interest to the study of classic authors, which hitherto has been little more than one of words.

FEW visitors to Ecouen are aware that JEHAN BULLANT or JEAN BULLANT, who was charged by ANNE DE MONTMORENCY with the erection of the château and church—a group that has been described as "un précieux joyau de la Renaissance"—was buried in the church which is a memorial of his genius. He was one of the versatile artists of the sixteenth century, and hence he is sometimes described as a sculptor. But his architectural power is evident when it is found that he was associated with PHILIBERT DELORME in the erection of the Tuileries. He died at Ecouen on October 13, 1578. In his will, which was made two days before his death, he describes himself as architect of the buildings of the King and the Queen-mother (HENRI III. and CATHERINE DE MEDICIS). After recommending his soul to GOD, to the Glorious VIRGIN MARY, to "Monsieur SAINT MICHEL-ANGE" and "Monsieur SAINT ACCUEL," his patron, BULLANT ordered that he should be buried in the church before the crucifix. To gain the prayers of "gens de bien" he gave "cinq sous parisis." He also bequeathed to the church of Ecouen in perpetuity a piece of ground in order that a high mass should be celebrated and a requiem and "libera" recited beside his grave for the repose of his soul. His executors were also to carry out his instructions with respect to the bequests to the churches of the neighbourhood for the same purpose. The Château of Ecouen has undergone many transformations. It was seized by LOUIS XIII. and given to the Duchess D'ANGOULÊME. Afterwards it passed to the CONDÉ family. The treasures contained in it were dispersed during the Revolution. NAPOLEON utilised it as a school for the daughters of members of the Legion of Honour. At the Restoration it was again made the property of the CONDÉS. Under NAPOLEON III. it was for a second time converted into a girls' school. So many changes were not likely to lead to the preservation of JEAN BULLANT'S work. The interior has suffered most, but there are parts which he even could still recognise.

THE will of JEAN BULLANT is important, for it shows that the term "architecte" was in use in 1578, and was so well recognised as to be adopted as a designation by a notary in drawing up a will. In the beginning of the sixteenth century the word "architecte" was unknown as a legal term in France. In 1518 GILLES LE BRETON, who had charge of the works at Fontainebleau, was described as "maçon, tailleur de pierre"—that is, mason and stone-cutter. In 1534 there was a reference to certain works by GUILLAUME DE LA RUELLE, "maistre des œuvres de maçonnerie," and "LOUIS POIREAU, maçon juré d'icelui sieur." No less important is the fact that ROBERT ESTIENNE, in his French-Latin dictionary dated 1539, gave as the equivalent for *architectus*, "maistre masson ou charpentier." A change was soon afterwards brought about by the employment of Italians in France. SEBASTIAN SERLIO was invited to Fontainebleau, and appears to have superseded Master GILLES LE BRETON. A warrant of FRANCIS I., dated 1541, authorises the payment of money to "nostre cher et bien amé BASTIANNET SERLIO, paintre et architecteur du pays de Boullongne." That was the first employment of the new term in France. In 1546 HENRY II., writing to PHILIBERT DELORME, described him "nostre amé et féal conseiller et ausmonier ordinaire, notre architecte ordinaire." Once employed, the word was not given up, and the dying BULLANT in 1578 was consequently in a legal sense "architecte" to the King and the King's mother. The change from master of works to architect indicates the variation in practice which was taking place in the sixteenth century. VASARI, who was writing at the time when DELORME was acting as almoner and architect, suggests the extent of it when he said that an architect, in addition to special knowledge, must have had experience in painting or sculpture, or woodwork. The art was passing away from the masons, and was becoming a supplementary calling to painters, sculptors, inlayers, or to men who were ordained as clerics but found their office did not return much profit. The change was not always advantageous, for, according to VASARI, many pretenders were in his day posing as architects because they were acquainted with perspective—in fact, they were draughtsmen who were deficient in the rudiments of construction.

THE system of independent contractors for various trades does not appear to be economical in America. A special committee appointed to report to the Convention of American architects at Chicago, in referring to the extras on account of plastering, say:—"While we recognise the fact that employing plasterers are frequently required to do more patching than can be accurately estimated for, still, the necessity for such patching is largely due to the carelessness or dilatoriness of the mechanics engaged upon the other branches of work in a building, and for this the owner is in no wise responsible, and consequently should not be expected to pay. It would clearly not be good policy, nor would it be just to open so fruitful an opportunity for extra charges against an owner, as the already too great disregard by one mechanic for the work of other mechanics would increase a hundredfold, were it understood that the owner, although not responsible for it, must make good, at his own expense, damage done to any department of work in his building. The experience of master plasterers in previous work ought to enable them, with little trouble or risk, to establish, in making fresh estimates, a margin for possible (but seldom very excessive) loss, under this head. It therefore seems to us that the cost of unusual patching should be paid by those who have made it necessary, and that the employing plasterers should claim recompense from the several mechanics who have caused the unnecessary damage to their work." It would require a remarkably persuasive architect to induce the several incriminated mechanics or their masters to admit such claims. Nor would the plasterers care to have them asserted. Workmen are disposed to look very kindly on those who make "jobs" of the patching class for them.

THE resolve of the French Government to establish a professorship of French architecture in the Ecole des Beaux-Arts, is another instance of the operation of that law of evolution which gives importance to subdivisions. Architecture in general is almost too vast a subject to be taught by one man, and no two professors would correspond in their ideas of the importance of the respective divisions. The points which in one case would be discussed at great length, in others would be passed over. Hence it happens in France that some students have become so inspired by professors with love of Greek architecture, they cannot accept the national Renaissance as more than a debased manner of building. They may be compelled to utilise the more modern style, but it is against their inclination. Now France has a right to be proud of what has been done by the generations of architects who, since the time of the Romans, have flourished in the land. Their work is ample and varied enough for any professor to explain. It is not proposed to abandon the study of Greek or Roman work; but in building, as in language, it is wiser to begin with what is native.

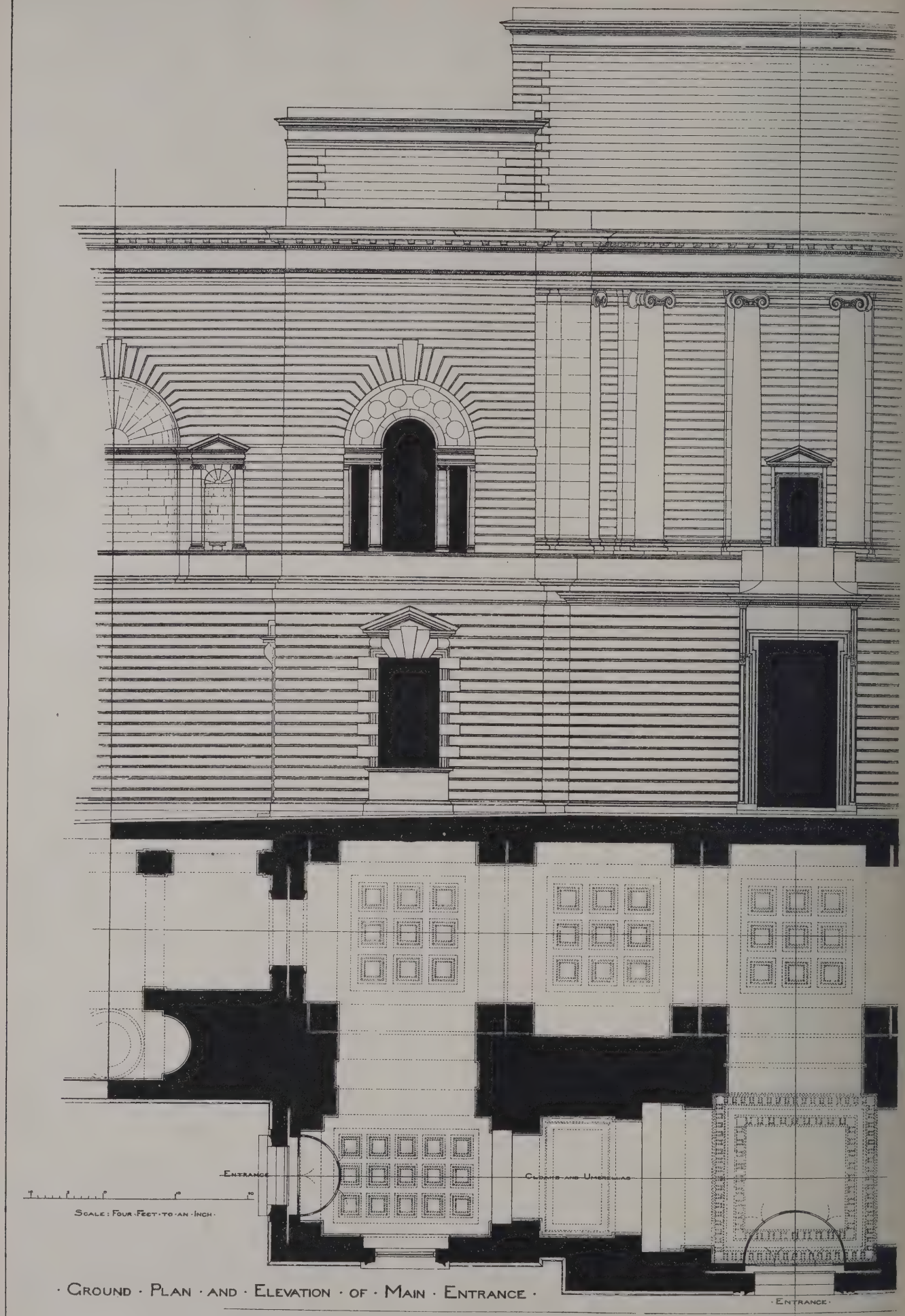

AURELIA
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ENTRANCE GATES: THE VILLA AURELIA, ROME.

Drawn by T. H. WATSON.



· Ground · Plan · and · Elevation · of · Main · Entrance ·

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

Design for the Completion of the South Kensington Museum. (Motto: "English Tradition.")

Detail.

MERVYN MACARTNEY, B.A., Architect.



RESIDENCE, BARNT GREEN, WORCESTERSHIRE. GARDEN FRONT.

INK PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET

The Architect, Nov. 20th 1891.



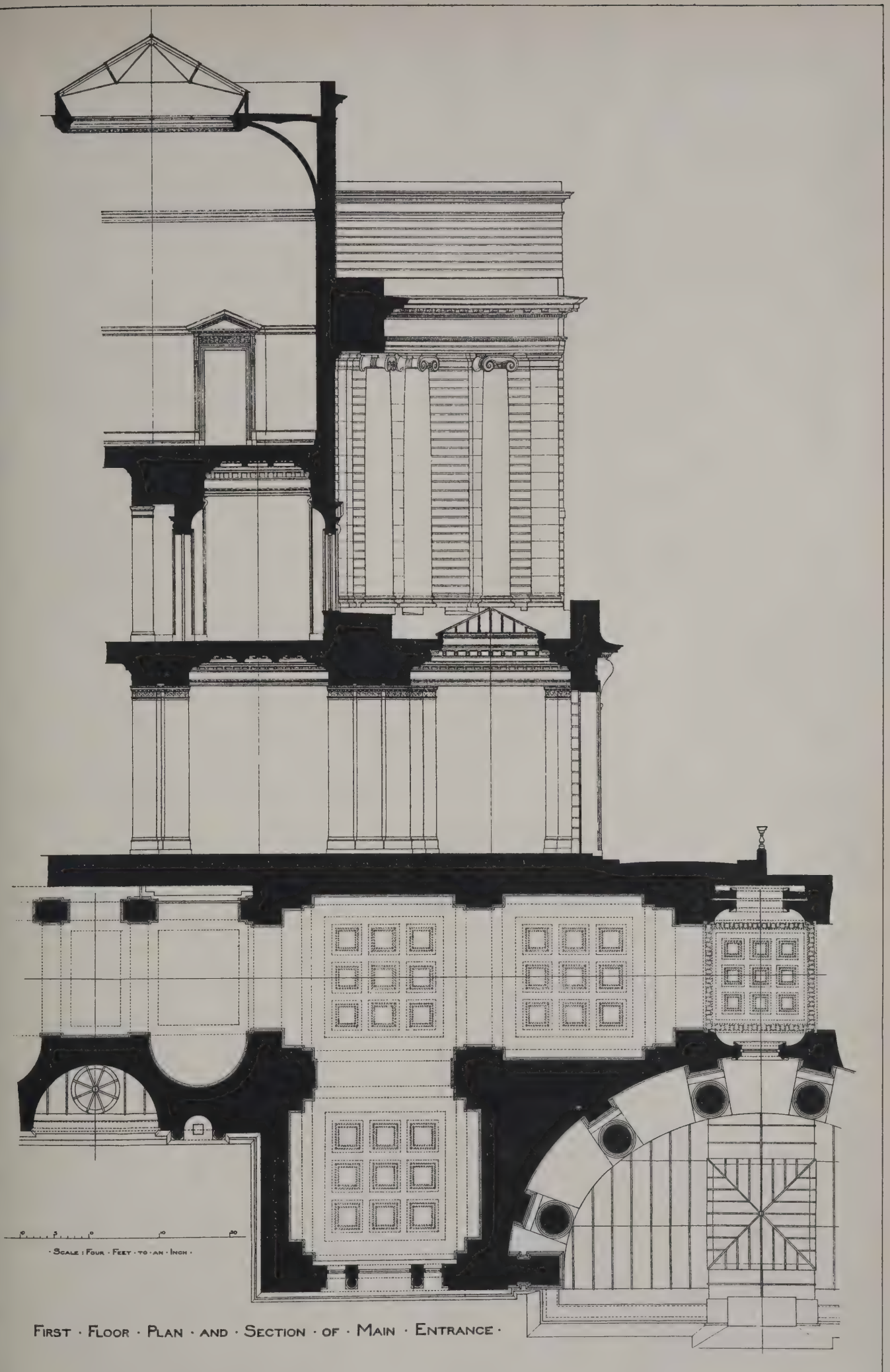
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RESIDENCE, BARNT GREEN, WORCESTERSHIRE: ENTRANCE FRONT

For THOMAS WALKER, Esq.

Messrs. ESSEX & NICOL Architects

The Architect, Nov. 20th 1891



First · Floor · Plan · and · Section · of · Main · Entrance ·

PHOTO LITHO SPRAGUE & CO 4 & 5 EAST HARDING STREET FETTER LANE E.C.

Design for the Completion of the South Kensington Museum. (Motto: "English Tradition.")

Detail.

MERVYN MACARTNEY. B.A., Architect.

ILLUSTRATIONS.

GATES FOR THE VILLA AURELIA, ROME.

THE Villa Aurelia was formerly known as the Villa Savorelli, on the Monte Gianicolo. This villa has been found to have been built upon and had incorporated into its structure a considerable part of the wall of Aurelian: hence the recent change of name. Large outlays have been made by the present owner to adapt it to English uses, and to repair the injuries done to it during the time that Garibaldi, making this villa his headquarters, held Rome for some time against the French. The Roman Municipality altering the approaches to the Public Gardens in this beautiful western part of the ancient city, the entrance to the villa had also to be altered, and the present design for wrought-iron gates was made. Our plate is from a coloured drawing by the hand of the architect, Mr. Thomas Henry Watson, exhibited this year at the Royal Academy.

RESIDENCE, BARNT GREEN, WORCESTERSHIRE.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NOS. 437 AND 438.—DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM. [M. MACARTNEY.]

In the description of the church of St. Mary the Virgin, East Grinstead, Mr. W. T. Howdell, architect, an illustration of which appeared last week, it should have been mentioned that the "Climax" Ventilating Company, of 15 Great George Street, Westminster, supplied the roof-ventilator. On referring to the illustration it will be seen that the ventilator is adapted to the style of the church without any loss of efficiency.

THE ARCHITECTURAL ASSOCIATION.

THE fourth ordinary meeting of the Association took place on Friday evening, Mr. F. T. Baggallay, president, in the chair.

The following gentlemen were elected members :—Messrs. G. W. Curtiss, L. Walmisley, G. H. Manning, W. E. Tower, E. Youart, F. Catlin, J. K. Bateman, J. Allen, F. H. Nowell, R. E. Bennison, A. Wood, M. S. Hack and A. Nicholson.

Donations to the General Fund were announced and the thanks of the meeting awarded to the donors.

Mr. F. R. Farrow was re-elected as vice-president by acclamation.

Mr. C. H. Brodie then read a paper on

The Planning and Construction of American Frame or Timber Houses.

Mr. Brodie said :—Frame houses are the type of American homes—no matter whether you go to the north, south, east or west. In the actual town areas the erection of timber houses is now forbidden—as you may naturally enough suppose when I tell you that the fact that they were not at that time tabooed accounted for a loss of some 40,000,000*l.* sterling caused in Chicago alone by the great fire there on October 8 and 9, 1871. This fire practically cleared three and a half square miles of the best and busiest portion of the city, and destroyed something like 17,500 buildings. Still, in the Southern States universally, I am told, and over the country and suburban districts which I saw myself, it is rarely that any but a timber house is erected. And the reason for this is simple. In the first place, directly a man is well enough off to live out of town he buys the freehold of a plot of land. On this he wishes, of course, to build a house—not to last all time, but to last his time, and, perhaps, also that of those immediately following him. He wants it, too, "right now," as he would put it, and "don't want to wait a year or so" before taking possession. On special inquiry I am told by an architect of much experience that the average time for erecting a frame house is ninety days, but he has known many built in sixty days; whilst, also in answer to my question, he tells me that the life of the structures may fairly be averaged at fifty years, whilst there are very many in existence even a hundred and some two hundred years old and over. Again, quarries being as yet worked are few and far between, and brickworks are not by any means numerous. But the country abounds with the most beautiful timber, with which even the denuded Eastern States are kept plentifully supplied by means of immense rafts floated down the great rivers to convenient points for transport by rail or boat.

A mere glance at the drawings I have here will, I think, convince you that a frame house may be very expeditiously erected. For what do the drawings show? A basement, rising only a foot or so out of the ground, built of either brick or undressed stone, and on this a frame of what we call quarter partitions, two storeys high, forming enclosure and divisions. These and the joists being fixed in position, the roof can be immediately constructed and covered in, so that whilst the outside is being completed the inside, too, is progressing, and during the time that we should be getting up a scaffold the frame-house is built. The plasterwork being then, if necessary, dried by artificial heat, the joinery and other fittings are placed and the dwelling is ready for occupation in the time I have stated. Should the worthy owner's family increase, as families do even in enlightened America, additions to the house are just as easily and expeditiously made.

And now let us look at the plans. As I have said, these show a basement and two upper storeys, and the roofs being mostly of a steep pitch plenty of room for attics is obtained in them. The basement contains a laundry, beer and wine-cellars, coal ditto for both house and furnace-coal, larders and, most important perhaps of all, the heating-chamber, containing either a boiler for steam or a furnace for hot-air heating. The heat there generated is distributed by ducts quite evenly over the whole house, and many of the rooms, you will observe—in fact, most of the rooms—have no fireplaces. This is a stage of civilisation to which we, I regret to admit, have not yet generally attained. To warm by direct radiated heat a space of about 10 feet square, or less, with an enormous expenditure of coal, seems to be still our ideal. I do not mention the beautifully heated column of air, &c., extending vertically above the fire, because the occupants of the house do not get the benefit of the heated air, although those outside do get that of the, &c.—much to their sorrow at times. But still we have that proud possession of our race, the "domestic hearth," so let us freeze in our staircases passages and even bedrooms, and continue, by our actions at all events, to wish long life to both fog and soot. Where fireplaces do occur, and this is chiefly on the ground-floor, an ashpit is provided under each, into which, when the hearth is swept up, the ashes, &c., are dropped by moving a dump or hopper. These ashpits are marked on the basement plans. The ducts of which I have spoken serve in the hot weather to distribute cold air over the house, the air in the cellar, whence they start, being naturally cooler than that outside, whilst it can, if necessary, as it frequently is, be cooled still further by artificial means. On the walls you will see a sheet of illustrations of hot-air furnaces and also of steam-radiators cut from advertisement sheets. The form of the latter has become familiar to most of you during the past two years from their frequent introduction into theatres, &c., whilst it would take an engineer to fully explain the former.

Coming to the ground-floor, or first storey, as you will notice the plans have it, we find a parlour and dining-room, and also perhaps a library or a second parlour. The dining-room is always in connection with the kitchen through a lobby or pantry. You will note also that there is no scullery shown, although on some of the plans is a diminutive space marked "sink-room." On this floor are also various store-rooms and closets, w.c.'s, lavatory, &c., depending as to size, number and variety on the general dimensions of the house. And here I would call your special attention to the very complete way in which these, like all classes of American houses, are fitted with cupboards, shelves, drawers, sideboards, book-cases, &c., all conducing in so eminent a degree to the comfort and ease of the occupants. I venture to think that in this respect too we are much behind our over-sea cousins, and even when designing for them our architects seem to avoid consideration of such real necessities. Take for instance a design hung on the wall by one well known to most of us. There are but two cupboards on the ground-floor and two in the attics. The four principal bedrooms have none. Now, I can assure you that no bedroom that I occupied in any private house in the States was without a cupboard large enough to walk into and turn round in. The convenience of this is too obvious to need expression.

The hall is always furnished and used as a room; you will see most of the plans have it designated "reception-hall," and some even "sitting-room." The verandah is also a most important feature, and one never omitted. During the hot season it is enclosed with blinds, and becomes the most frequented part of the house, even the lighter meals being served in it.

The first floor has the usual bed and bath-rooms, linen closet, &c. You will observe that in most cases the w.c. apparatus is kept away from, and not, as with us, next to the outside walls. This is to avoid fracture by freezing during the intensely cold weather. I may here tell you that in Chicago I have passed several weeks with the thermometer all the time many degrees below zero. At St. Paul, the week before I got there, the thermometer had gone down to 40 degrees below zero, and yet in that district this is but little felt, as there is a total absence of wind—a happy case, in which Chicago never

shares; it is known, in fact, as the windy city. I was in New York the day of the great blizzard, and had to go to and from my office on foot, after scrambling down from the elevated railroad. I show some photographs of the effect of this blizzard. It is a little disconcerting to an Englishman to go home to tea, and, being on the opposite side of the street to the house which, in that case, he is so desirous to enter, to see a bank of snow extending from the footpath he is walking on to the first-floor window-sill of his domicile. We get weather here, and some of us grumble at it perhaps, but other places share an even worse fate. To return to our first-floor plan. You will note that all the chief bedrooms have a fixed lavatory fitting, generally in a cupboard, so as to be out of sight. This adds, of course, very considerably to the plumber's bill, but in the long run it is a great saving, for labour of all kinds is terribly costly, and this is especially the case with what is called domestic "help"—even if such is obtainable at all. See what is saved annually in breakages, and in the labour of carrying up clean and taking away dirty water. Balconies are freely provided on this floor, and are delightful spots in the hot weather, whilst they always form a feature in the elevations. The attics are used for servants' rooms—each still with a cupboard, you see—boxrooms, storerooms, &c., or the space is frequently just floored and then left to be cut up as the wants of the occupants may later on suggest. About the elevations, outside and in, or—to adopt the cant phrase now happily less and less heard—the artistic part, I shall say nothing except that, to our eyes, at all events, the calm and dignified treatment of the English example contrasts very favourably with the fussiness and, if I may use the term, over-picturesqueness and evident striving after "features," which spoils so many of the other designs. One must remember, however, that in dealing with such a pliable material as wood, the temptation to let-off all one knows is undoubtedly a strong one.

And now as to the construction. This you can study at your leisure by referring to a specification printed in blank, which is in the Institute library. It is indexed under the name of the publishers, Messrs. Palliser, of New York, to whom I am indebted for a good deal of the information this paper contains, and for a drawing and specification hung on the wall. Some books published by this firm can be obtained at Batsford's, if you wish to pursue the subject. From the specification I have mentioned I have taken rather copious extracts, which I fear it would be tedious to read or listen to, but I was certainly struck with the very practical character of most of them. For instance, among the general clauses I read:—"The carpenter will make all patterns, &c., and will provide suitable protections to all openings to keep out the cold, rain, &c., and will clear the building of all carpenters' waste materials before the plastering is commenced. The mason must provide coal and stoves in cold weather for heating the building while his work is going forward and until it is dry."

Continuing, we shall get particulars as to how this class of house is put together, and we naturally find after the general clauses the necessary directions as to the excavations. The only unusual point here is that I read:—"The bank is to be dug well away from the walls, and left open until the walls are set and dry." Then the footings are described. They are for both brick and stone walls, "large flat stones not less than inch thick, and projecting inch on each side of the wall above, and to be laid on the natural undisturbed earth." Their width and thickness would depend, of course, on the weight to be carried and the nature of the soil. The damp course is to be either slate and cement or asphalte. The brick walls are required to be built to "a true line from one end to the other, even to the cutting of a brick where necessary, so that the carpenter can size the joists to an exact width, and place them directly upon the wall without blocking up with chips or pieces of wood."

The facing of these brick walls is to be "neatly tucked and properly cleaned down with aquafortis, and oiled with raw linseed-oil at completion," care being taken not to injure, in cleaning down with the acid, any cut stonework. The laths for lathing are to be "laid a full quarter of an inch apart, and joints broken every 18 inches." Wood laths, however, are now rarely used. I never saw any at all. The plastering is put on wire-netting or one of the many forms of pierced or expanded metal now coming into use in this country. The plastering is to consist of "a good coat of brown, well-haired mortar, made of pure unslaked lime and clean, sharp bank-sand, free from loam and salt, and best cattle or goat hair, well mixed by continued working, and stacked in the rough for several weeks before putting on." The finish is to be "a coat of best soap-stone finish, manufactured by ——— Company, composed of finishing-lime, putty (two parts), and patent soap-stone finishing (three parts), thoroughly mixed two days before using, and applied in the most careful manner as per directions," I suppose of the manufacturers. I am of course following the order of the trades as they are placed in the specification, from which I am quoting. This differs considerably from our usual arrangement, and we next come to the carpenter and joiner. All the timber which will be exposed at the finish is required to be of a certain quality pine. The joists are to be placed in all cases with the "crowning" edge upwards, and those over so many feet in length are to be "worked crowning" so many inches before being placed in the building.

Describing the partitions—a most important item of a framed house—the specification directs that "all door and window studs are to be set double, and all openings over 3 feet wide trussed overhead. All angles must be formed solid by blocking and spiking two studs together. No studs are to stand on the floor, nor on the joists, if there are partitions under, but all are to foot on top of the partition plate below." The outside of the external partitions, and also the roof, is covered with $\frac{7}{8}$-inch match-boarding, called "sheathing," which has to be "nailed at each edge at every bearing with 10*d.* nails." Here I may add that nails are throughout the specification described as so many "penny" ones—a nomenclature common also in Ireland, I am told. The whole exterior is then covered with waterproof felt, the joints lapping 2 inches, and it is tarred under all architraves, friezes, cornices, brackets, &c., "so as to make a perfectly tight job." Outside this felt comes the finish, which is actually seen, which on the partitions is weather-boarding, or, as it is called in the States, "clapboarding." This is to be of "clear, dry, bevelled white pine, 5 inches in width by $\frac{1}{2}$ inch thick at the butt, and $\frac{3}{16}$ inch at the thin edge, laid with not less than a lap of $1\frac{1}{4}$ inches, and nailed with 8*d.* box-nails every sixteen inches. The nails to be set in." The verandah floor is to be constructed with $1\frac{1}{4}$-inch by $3\frac{1}{2}$-inch white pine boards laid with "paint-joints." The roof is generally covered with shingles, and so also are the gables and other features. The shingles are usually of cypress, which grows abundantly in the swamps of New Jersey and the more southern States. The logs are floated down the rivers to the various mills, where the shingles are cut in enormous numbers. I read of one mill cutting 300,000 daily. They are about 18 inches by 6 inches, and are fixed on battens, with on roofs $5\frac{1}{2}$ inches to the weather and on vertical parts 6 inches, each nailed with two nails and kept 3 inches from angle of valleys. Sometimes the roofs are of slate, and frequently they are flat, in which case they are mostly covered with tin, although asphaltum or gravel composition is sometimes used. In either case the roof is boarded on the joists with $\frac{7}{8}$-inch boarding.

Coming to the floors, I find that pugging, or, as it is called, "deafening," is used to all the best rooms, and these have also a double floor, a rough deal one and a hardwood finished one, with between them a layer of "all-wool, Pyramid-brand, resin-sized, deafening felt," fixed down by 2-inch to $\frac{1}{2}$-inch slips, to which the hardwood floor is secret-nailed. The rough floor is described to be fitted carefully round all studs, &c., up to the sheathing, so as to prevent mice circulating. Here is a good clause:—"All the plastering is to be finished, cellar cemented and all masonwork done and thoroughly dried through before any of the interior finished joinery is brought into the building or put into position." The materials used for doors are required to be thoroughly seasoned and kiln-dried, and on the plans the sizes for both width and height are figured. Sliding-doors are much used, while many openings have no doors at all; these would be provided with curtains, which give the desired privacy. There is no question of "draughts," you know, in an American house, which is warmed equally throughout. All the doors have a hardwood slip $\frac{3}{4}$-inch thick, splayed each edge, fixed under them. This enables the door to open clear of carpets, &c. The windows are mostly double-hung sashes requiring no special description. All are directed to have a burglar-proof fastening.

After a description of the stairs, most minute directions follow for the fittings of the various pantries and closets upstairs and down. These include clothes-closets, linen and china ditto, and butler's and kitchen pantries, as well as the various store-rooms. The descriptions are most interesting, but would, I fear, take too long to read. Then we get a full description of the refrigerator and ice-safe, which consists of two thicknesses of boarding, 2 inches apart, filled with mineral wool, then an air-space of 1 inch and a layer of rosin-sized waterproof paper, the actual inside being of clean, narrow-matched spruce. The lower part is the ice-safe or tank, and it is lined with sheet zinc and the bottom covered with a wood grating, to prevent the ice cutting the metal. The doors to these spaces are constructed in precisely the same way, and the joints between door and frame are double rebated. The wood finish is described to be first a certain patent "mineral filling," and then another "patent transparent wood finish." The hardwood floors are to be done in the same way, but with "vegetable" filler. The tin-work is to be painted two coats of metallic paint, and here I may say that this tin—or to speak more correctly, tinned-iron—is used wherever we use lead, and also for the rain-water pipes and gutters. Lead is too expensive, and is also more affected by change of temperature. The hot-air ducts from the furnace in the basement, of which I have previously spoken, are also made of tin, and are run up in the partitions. The hot air is delivered into the rooms through a sort of hit-and-miss grating called a "register." The positions of these are shown on the plans.

Coming to the plumber's work, I find that the soil-pipes are invariably of cast-iron, the joints being made with oakum and lead well caulked. They are painted on the outside with two coats of metallic paint, one before and one after fixing. Inside they are coated with coal-tar, or the pipes are "Mott's enamelled soil-pipe, not less than $\frac{3}{16}$th thick." The soil-pipes are kept well within the building, the water-closet apparatus being, as I have said, away from, and not next to, the outer walls. The syphon intercepting the drain from sewer is fixed within the cellar, and the drains generally, in fact, are inside and not outside the building, so as to be clear of frost. The water-pipes are of lead, all so arranged that they may be run dry, also to baffle that demon "Jack Frost," and laid on wood-strips or in wood-troughs. And here occurs another very practical passage:—"The plumber is not to cut any timbers; that will be done by the carpenter, and he shall not cut any to weaken them." Would that we could enforce that clause on both plumbers and gasfitters. Joints (lead to iron) are made with brass ferrules soldered to lead and caulked to iron as before described. The whole of the drainage has to be done according to municipal plumbing regulations, which are very strict. They often require that all soil-drains, as well as the vertical pipes, shall be of heavy cast-iron, and in all cases that the soil-pipes shall be carried through the roof full size and left open at top, and that an air inlet shall be provided on the house side of the intercepting syphon. Also that all sanitary fixtures shall have a trap as close to them as possible, each of which must have a back-air inlet to prevent syphonage. Brass-piping is sometimes used for hot-water connections, but galvanised wrought-iron is much more common and seems to be equally satisfactory.

As to the cost of these frame houses, one of the buildings illustrated is shown to have cost 2,935 dols. or 587*l*. This is a small house. A friend of mine writes me that he is just about building a ten-roomed house, which he says will cost from 700*l*. to 850*l*., and he puts the life of this as at least fifty years. A very small house illustrated and described in a local paper is said to cost only 1,500 dols. or 300*l*. In conclusion, may I say that I will answer, as far as I can, any questions which may be put to me; and I will vary the somewhat dry matter of this paper by quoting the dedication of a book of designs of houses of this class. Prose is evidently too feeble to properly commend the subject, so the book is inscribed:—

> To those who happy homes have always known,
> To those who plan and work such homes to own;
> To all who building homes would bless mankind,
> To all who in their homes a refuge find;
> To youth, whom wedded life will soon employ,
> To children dear, each day their parents' joy;
> To all who favour honour, truth, and love,
> To all whose virtues promise homes above.

Mr. Owen Fleming proposed a vote of thanks to Mr. Brodie for his paper. He did not hold the view that wood-surfaces stained and varnished were as effective and pleasing as Mr. Brodie considered them. In regard of the drawings exhibited some of the elevations were examples, he thought, of what was to be avoided. Others had been treated more satisfactorily. Others showed the architect had aimed at producing a simple effect for his building by long unbroken roof-lines and wall-surfaces. The buildings so treated were more effective than those covered with stuck-on features.

Mr. Horace Townsend seconded the vote. He said he had practised as an architect in America for over twelve years. He protested against criticising American architecture as fussy. Fussiness was no characteristic of American buildings, though it might, perhaps, have occurred in some of the buildings illustrated in the American papers. Some of the best architects would not let their buildings be illustrated. Their fault, in his opinion, was rather a straining after an artificial simplicity, an affectation that was as objectionable as fussiness. He instanced the old colonial buildings of simple character as having served as the model to the best American architects for designing comfortable houses. Among the features peculiar to America was the use of tinned iron for roofs, a cheap material and a lasting one if cared for and painted. Another excellent feature was the use of a hardwood sill to carry the door. Another feature was the absence of sculleries. In place of them a sink was placed in the kitchen. The sinks were deep and prevented any splashing over. For washing purposes several tubs from 18 to 24 inches deep were let into the floor fitted with grated outlets and supplied with hot and cold water. In concluding his remarks Mr. Townsend said American architects were quite able to take care of themselves and that they were in some respects ahead of architects in England.

Mr. F. T. W. Goldsmith said what struck him particularly in American architecture was the clever planning, all being arranged to save labour and to secure the convenience of the inmates. He much preferred the open fire to any system of heating by hot-water pipes. In addition, with hot-water heating there was the risk of an influx of cold air from outside.

Mr. Farrow said he preferred the open-fire system to that of conducted heat. The effect of stained woodwork, he said, might be seen at Professor Herkomer's colony at Bushey. Wood houses, no doubt, were cheap and easily built, but one drawback was the risk of fire.

The President then put the vote, which was further supported by Messrs. W. H. White, J. W. Penfold, J. A. Shaw and E. Woodthorpe, to the meeting, and it was carried by acclamation.

Mr. Brodie, in replying, said the wood used for joinery was so beautifully marked that it would be a shame to paint it. The entrance of cold air was guarded against by the provision of double doors and double window-sashes, lobbies, &c. In regard of risk from fire, wooden houses were mostly isolated. There were no fireplaces and the floors were fireproof, and thus they were not very inflammable.

LINES OF FRONTAGE AND CORNER HOUSES.

An appeal was heard this week in the Queen's Bench Division which relates to the exercise of the power for regulating lines of frontage in new neighbourhoods where there is no "street" formed or any definite visible line of frontage. It was a case stated under section 3 of the Act of 1888 (51 & 52 Vict. c. 52) to amend the Public Health Act, 1875, with respect to bringing forward houses or buildings in streets, the section being in these terms:—"Section 156 of the Public Health Act of 1875 is (save as mentioned) hereby repealed, and in lieu thereof it is hereby enacted that it shall not be lawful in any urban district, without the written consent of the urban authority, to erect or bring forward any house or building in any street, or any part of such house or building beyond the front main wall of the house or building on either side thereof in the same street, nor to build any addition to any house or building beyond the front main wall of the house or building on either side of the same." The question had arisen, How, if a house is a corner house and is in a new neighbourhood in which no street has been formed, is this enactment to be applied? The case occurred at Clacton-on-Sea on the coast of Essex within the rural sanitary district of Tendring. The charge was that one Warren unlawfully, and without the consent in writing of the sanitary authority, did bring forward a certain house, forming part of a street called Castle Road, beyond the front main wall of the house on the west side thereof. But the house was at the corner of Castle Road and Old Road, and having its main entrance in Old Road. The first buildings erected in Castle Road were eleven cottages, still standing and occupied, the actual buildings and the entrance to each standing 8 feet back from the road, that space belonging to the owners of the cottages and used by the occupiers as gardens, and fenced off from the road, and so forming no part of the footpath or road. Between the last of the cottages and Warren's is a space of 64 feet, not built upon, but marked out and intended for building on. Warren, the defendant, had used a space of about 36 feet in depth of his "return" frontage in Castle Road for the purpose of forming a yard, back premises and garden to his house, the house in question. Thence commences the so-called "return wall" of the house in Castle Road, the subject-matter of dispute in this case, which wall is built close up to the footpath in Castle Road for a length of about 42 feet. The Castle Road in question is a *cul de sac*, and the land beyond the cottages is open pasture. The portion of Castle Road opposite to the house of Warren and to the extreme end is not built upon and is open land. It was admitted that the house in question was situate at the corner of two roads, Old Road and Castle Road, the principal entrance being in Old Road and having a so-called "return frontage" in Castle Road. It was proved that Warren was owner of the whole area of the ground on which the house stands, and that the local authority had not expressly fixed any definite building line in Castle Road, but they had approved of the plans for the eleven cottages, and so, it was said, had impliedly adopted a building line, beyond which a new building on either side thereof could not be brought forward, and the question was whether that was so. The magistrates convicted the defendant, who appealed. He contended that the house in question was in Old Road and not in Castle Road, and that the frontage in Castle Road was only what is known as a "return frontage," and therefore not amenable to the building line in Castle Road; and that, assuming that the house was in Castle Road, there was no house or building on either side of it beyond the front main wall of which on either side the defendant had erected or brought forward any house or building, and that the erection of the eleven cottages was not a "fixing" of the building line by the rural authority. The magistrates were of opinion, however, that the house was both in Castle Road and Old Road, and that it was amenable to the building line fixed in Castle Road, and was a continuation of a straight line formed by the front wall of

the cottages, which constituted houses or buildings on either side of the house, and that therefore Warren had brought forward a house and building beyond the front main wall of the house or building on one side thereof. The question was whether these findings were correct in point of law.

For the defendant (the appellant) it was contended that the house was in Old Road and that the cottages formed no "line of building" beyond which it could not be brought.

On behalf of the rural sanitary authority it was contended that the conviction was right. The house was in Castle Road or in Castle Road and Old Road, and the cottages formed the "building line" beyond which the house could not be brought. The question was important, as this was the only enactment which gave the local authorities any power to keep new buildings within any line of frontage. [Mr. Justice Mathew: That view might entail great hardships upon individuals.] Possibly, but Parliament must be taken to have contemplated that.

The Court came to the conclusion that the conviction must be upheld.

Mr. Justice Mathew, in giving judgment, said it appeared there was a row of cottages at a certain distance, and the complaint was that the house in question was brought forward beyond the line of those cottages, which, it was said, formed a building line, and the magistrates had come to that conclusion. That interpretation, no doubt, led to some startling conclusions, for this consequence would follow—that the owner of the cottages would have a right to pull them down and bring forward the line of building. But though that was a startling result, could the language of the Act be got over? There was a protection afforded by the requiring the consent of the local authority, and also by the judicial power of the magistrates, who, however, in this case had decided against the defendant. It had been ably argued by Mr. Grain that the cottages formed no line of building, but the magistrates had found that they did form such a line, and that the house was in Castle Road and amenable to that line. The Court could not hold as matter of law that they were wrong in their view of the facts. They had found that the cottages were on one side of the house in question, and that finding must be taken. There was a decision in Raventhorpe *v.* Hincliffe (24 Q.B.D.) to that effect. The conviction, therefore, must stand.

Mr. Justice A. L. Smith was of the same opinion, and pointed out that the present enactment clearly applied to new buildings. It had been held no doubt in the case cited that the frontage taken must be "in some degree of proximity to the building in question." But that was a matter of fact for the determination of the magistrates, and in this case they had determined that the frontage formed by the line of the cottages was in sufficient proximity, and, whatever he might think of their decision and however much he might regret it and regret the hardship it might cause to Mr. Warren the Court must adopt it.

Conviction therefore upheld and appeal dismissed.

THE PROPOSED ART GALLERIES, GLASGOW.

THE opening meeting of the architectural section of the Glasgow Philosophical Society was presided over by Mr. James Thomson. In his address, he began by referring to the extension of the municipality, and to the chances of the solution of the cross-river question. It had been said that the history of industrial Glasgow was written in its bridges; but he thought it was known best by its well-laid-out streets and substantial buildings. One subject uppermost in their minds at the present moment was the proposed erection of an art gallery and museum. The discussion on the latter subject had brought up sharply the fact that our city had been far behind in providing places of recreation for the people and a home for the art school. They all knew the struggle for existence the Glasgow School of Design had had for many years, although it had distinguished itself by gaining a high position among the schools of art in Great Britain. It should be the interest of the people of Glasgow to see that the school of art was not only perpetuated but cared for by such enlargement and endowment as was necessary for the encouragement of students in all the branches of art, as well as of our painters, who had made a name for themselves. The site which had been placed by the Corporation at the disposal of the Association for the erection of the new gallery was in many respects a most admirable one. No doubt it was far distant from the business part of the city, and very much out of the way of residents in the eastern and south-eastern districts. But this objection was rapidly in process of being overcome. As he did not intend to send in a competitive design, he thought he might offer some suggestions as to the position of the building. The first difficulty which occurred to him was that the surroundings of the site shown on the block plan were in many respects unsuitable. The whole southern frontage of the new building would be hidden from view by several four-storey tenements of shops and dwelling-houses of the ordinary kind. Then at the centre of the site the main thoroughfare took an angular direction. He thought the promoters should carefully consider the propriety of changing the site. Dumbarton Road had become a great thoroughfare, and it would be more so every year. Any important building to be erected in that neighbourhood should be made to face the best thoroughfare. By placing it in the position indicated the building would not only have a frontage towards Dumbarton Road, but it would have a southern aspect. This need not interfere with the other elevations, as they could be treated in relief. As to the question how this change of site could be accomplished, he suggested the removal of the buildings on the triangular piece of ground to the west of Radnor Street. No matter what the expense might be for this part of the scheme it ought to be carried out. By this alteration they would secure for the building a good background, and the general features might be made to harmonise with the surroundings. In concluding, Mr. Thomson said if the promoters tried to carry out the present idea of having galleries only for pictures and music, and making the art school a secondary affair altogether, they might depend upon it it would end in failure. On the other hand if they resolved to have a well-equipped art school, it would be sure to prove a success. On the motion of Mr. Campbell Douglas a vote of thanks was passed to Mr. Thomson for his address.

ARCHÆOLOGICAL DISCOVERIES ON THE GREAT ST. BERNARD.

DURING the last two summers, says a correspondent of the *Scotsman*, Professor von Duhn, Professor of Archæology in the University of Heidelberg, in conjunction with some Italian scholars, has been conducting excavations on the Pass of the Great St. Bernard. From the experience gained in other Alpine passes, archæologists had long since suspected that a careful search would also reveal remnants of ancient settlements on this the most important of the Alpine passes, and in 1890 the assistance of the Italian Government enabled the excavations to be begun.

The exact track of the old Roman road across the narrow plain which covers the top of the mountain having been ascertained, a ditch was dug from the northern end of the plain towards the east, and after a few weeks' careful excavation, the ruins of a Temple of Jupiter were laid bare. Similar temples have been found on almost all the other Alpine passes, for it was customary for the Roman traveller, in the fresh and bracing air of these Alpine regions, to adore the God of the Skies, thanking him for his kindly protection on the journey, and presenting him with small offerings. These offerings consisted mostly of small votive tablets and coins, sometimes even of statues, images and other valuable gifts. Many coins were found in and around the temple, but it is remarkable that all belonged to the Imperial period, scarcely any Republican coins having been found on the ground so far as excavated, a fact which has some significance in regard to the date of the origin of this settlement. It points to the conclusion that, like all the other Alpine roads, the Great St. Bernard Pass was not used as a commercial road between the south and the north of Europe in the time of the Republic.

Of course the lowest Alpine roads were known to merchants in very early times, but they were used only for the local trade between the valley of the Po and the South of Germany. The Greek and Roman merchants were afraid of the towering chain of these snow-clad mountains, with their wild and barbarous tribes, and had found out a much easier way to the north, going either from Massillia (Marseille) up the Rhone Valley to the interior of Gaul and Southern Germany, or starting from the shores of the Black Sea, whence a very old commercial road led them to the coasts of the Baltic and the German Ocean. This also accounts for the curious fact that the harbour of Genoa and all the ports of the Adriatic, Venice, Trieste, Brindisi, &c., which played such a prominent part in the Middle Ages as transport ports for the Oriental traffic, either did not exist or were little known in those ancient times.

It was not until the days of the Roman Emperors, when the government of the northern provinces necessitated a closer connection with the mother-country, that the Roman merchant followed in the steps of the Roman soldier across the Alpine roads which were then being constructed, and which even now excite the admiration and astonishment of the travellers. Of all these passes the great St. Bernard, deep and inaccessible for carriages as it is, soon became the most important, being the gate for all the troops which were going to or from the northern provinces—Gaul, Britain and Germany—a fact which renders the results of these excavations of so much moment to archæological science.

On the other side of the road, opposite the Temple of Jupiter, stands a small hill with steep and precipitous sides, the excavation of which was begun this summer. In spite of the most careful investigation, no remains of a building were dis-

covered on the top, and nothing but two small holes in the shelf of rock showed the activity of human hands. But in all the clefts of the rock Gallic coins were discovered, and it puzzled the antiquaries at first to account for this phenomenon. But this had evidently been the site of an old Celtic sanctuary, and the coins thus disinterred had the same significance as those found in the Temple of Jupiter. They were offerings presented to the deity. The entire absence of ruins is another proof of the well-known fact that the Celts, like the old Germans, preferred to adore their gods in the open air, and without a building or an offering-cup they simply dropped the coins into the crevices of the rock.

From this hillock the ground slopes eastward towards a small pond which gathers the waters of the surrounding heights into the basin. Professor von Duhn had this pond drained by means of a dam, as it seemed not improbable that some valuable relics might have been carried by the water into the basin, and the result fully justified the expenditure of labour. Almost the first cut with the spade revealed a neat little bronze statue of Jupiter, which, though not a first-class work of art, yet affords evidence of considerable technical skill, and had been very probably taken from one of the north Italian brass foundries. Soon afterwards a quaint little brass horse appeared, wearing a saddle of panther's skin. Several other images and precious articles were then dug out, but no ruins of a building nor coins were found, which points to the conclusion that the pond must already have existed in Roman times.

Further excavations in the middle of the plain, west of the road, laid bare two rooms of a large building, the full examination of which has been postponed till next year. It seems clear, however, that the whole plain must have been covered with buildings, as the very extraordinary position of the Temple of Jupiter suggests. The back wall of the temple is built so close up against the cliff that part of the rock has been cut away to get sufficient room for the temple. Had the rest of the plain been empty at the time when the sanctuary was built, it is more than probable that it would have been put in the centre of the plain, and not banished into the most northern corner.

A further discovery of the highest importance was made by Dr. Schumacher, a German scholar, who was present at the investigations this summer. After breaking through the Mediæval Roman and Celtic strata, they had everywhere struck a layer of yellow clay, which apparently had settled down from the waters of the neighbouring mountains. As the formation of this layer must have required a good deal of time, it was inferred that the clay stratum marked the bottom of the ruins, and that it was no use to dig deeper. Dr. Schumacher, however, was led to pierce the clay layer at several points, and a stratum of charred remains came to light. No doubt we have to do here with the ruins of a settlement preceding that of the Celts, and as the clay layer is of considerable thickness, it is apparent that, after the destruction of this settlement, the Pass must have remained unused for some length of time. These remains may even date back to the Etruscan period, but this and many other points can only be settled by further excavations.

AIR ANALYSIS IN MANCHESTER.

THE Town Gardening Committee of the Field Naturalists' Society have received the subjoined interim report from the Air Analysis Sub-Committee.

In prosecution of the work already commenced, records of the character and composition of the air are now being carried on, taken at six stations, of which four are situated in Manchester and two in Salford. For the carrying out of the necessary operations at the stations we are indebted to the enterprise and co-operation of a number of persons who have interested themselves in the question, whilst the testing and final determinations are made at Owens College. The amounts of sulphurous acid and organic matter have been observed regularly during the past three months, and, although there has been as yet no period of serious or long-continued fog, a very marked increase has taken place, both in sulphurous acid and organic matter, especially during the past month. Speaking generally, the district of Ancoats and the centre of the city show the greatest amount of pollution. In addition to this work, samples of rain are from time to time collected in various districts and analysed. A further expansion of the work consists in the measurement of the intensity of the light in various parts of the city and suburbs. The amount of light is measured for each day by means of a sensitive solution, and with the valuable assistance of a competent observer at each of the thirteen stations now in operation it is possible to compare the quantity of light (not sunlight only) at the different stations. It has been established that not only the life and health of plants, but also that of animals is largely dependent on light, and we therefore attach great importance to these observations. From the results already obtained it appears that—1. Taking the amount of light (chiefly actinic light) received at Didsbury as 100, we find the average amount for this period of the year is in York Place, Oxford Road, about 80, whilst in Embden Street, Hulme, it is only 65, and in the centre of the city and at the meteorological station in Oldham Road it falls to 50 or 55. The following records, extracted from the observation-book, showing the returns for a few typical days and representative stations, will indicate the character of the observations made :—

	Didsbury.	York Place.	Hulme.	Oldham Road.	London Road.	Sunshine.
Sept. 12, Bright and sunny all day .	60	45	35	34	11	8·5
Sept. 16, Dull all day . . .	30	22	14	17	11	nil
Sept. 20, Very dark all day . .	8	4	2	3	11	nil
Oct. 8, Morning sunny, afternoon dull	42	35	30	24·5	27·5	5·7
Oct. 11, Gloomy till ten, then dull .	20	12·5	12	9	10	nil
Oct. 15, Dull, with heavy clouds .	14	8	6	5	7	nil
Oct. 24, Foggy nearly all day . .	15	2	4	2	3	nil

2. In the summer months the difference between town and country is not so large, but it becomes more and more pronounced as the winter months are reached. 3. Fog cuts off the actinic light almost completely, the record in the country (free from fog) being for the same day 10 to 20 times that in town. 4. The general falling-off of light as the season advances is also most striking, the amount in October, taking similar days, being little more than one-third that measured for August. In connection with this subject we may further mention that the observations on the clearness of the atmosphere have been carried out by Mr. Roos at the Town Hall since the commencement of February, and it is proposed that they should be continued so as to embrace the period of a whole year.

A grant of 50*l.* has been received by the committee from the Royal Society out of the Government fund towards defraying the expense of carrying on its work. The committee have become incorporated with the Scientific Committee of the Royal Horticultural Society, who are conducting similar inquiries in London. These inquiries are taking place under the supervision of the Manchester section.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

THE NUREMBERG VIRGIN.

ARCHÆOLOGY would be incomplete if it did not take notice of the relics which suggest old modes of dealing with offences. Hardly a century has elapsed since it was said that property in England was hung round with gibbets; but abroad, and in a past age, not only property, but position was encompassed by things that were more terrible. In Nuremberg artists and poets abounded, and evidently there was no lack of imagination among its inhabitants. They turned it to account in devising instruments of torture which were unparalleled at the time, and unhappily the parts of the buildings where the punishment was inflicted were no less ingeniously planned. Few men have had the courage or the opportunity to explore all the dungeons of Nuremberg, and therefore the following account of them by Mr. R. L. Pearsall is as unique as it is fascinating :—

Everything involved in mystery carries with it a certain degree of interest, especially when connected with the history of the past; and there are few things more deeply so involved, and more calculated to show the worthlessness of criminal tribunals under irresponsible authority than the singular judicial enormity commemorated in the following pages.

In England we have been barbarous enough, cruel enough, and bad enough during the early part of our history; but, thanks to the publicity of our judicial proceedings, those who fell under the hands of the executioner perished before the eyes of the world, in a mode prescribed by the law, and obliged to be followed by its officers. This was not the case in other countries. Wherever there was a despotic monarch, or an irresponsible corporation endowed with an unlimited criminal jurisdiction, men were accused, imprisoned and never more heard of. Their probable fate could only be guessed from circumstances, or some unguarded expression from the lips of such as were likely to be aware of it, but their possible fate was not so much a secret. "Let fear come to all" has been a common maxim amongst penal legislators; and in order that fear might come to all under the governments of ancient Continental Europe, they did not hesitate to insinuate darkly the means which they had of proving and punishing crime whenever a man might be accused of it. Notwithstanding this, it was seldom or never the case that men knew what torture or death might be in store for them, if they rendered themselves liable to the suspicions of their magistrates.

"Passer par les oubliettes" was a well-known phrase in

France, and yet few were able to define its meaning accurately. Every one, however, understood that where a man was considered by the tribunals to be guilty of certain crimes, he was doomed to pass, as it were, into oblivion by descending, through trap doors called oubliettes, into the nether regions of his prison, from which he never returned.

"The Kiss of the Virgin" (or Jungfernkuss) was an equally well-known phrase in Germany, and its import was almost as little understood. A general impression, however, reigned amongst the multitude that in certain towers and prisons there was a terrible engine, which not only destroyed life, but also annihilated the body of the person sacrificed; and this, from being constructed in the form of a young girl, was called "The Virgin."

During a residence in Germany, some years ago, chance threw me in the way of hearing much of this engine, without being able clearly to understand what it was, excepting that it exercised the functions of executioner, and exterminated its victims by hugging them in arms furnished with iron blades. Thus they were soon deprived of life. It was said to have existed in many towns and castles and even convents; but more particularly in those secret tribunals which were so numerous in Germany during the Middle Ages, and which are frequently given the credit of having first employed its services. The castle of Königstein, near Frankfort, is said to have possessed one of these instruments of destruction, and a tower in the town hall of Mayence, situated near the butchery, is pointed out as having been the seat of another. I examined both these buildings in hope of finding some vestige which might give me an idea of the form of the machine and mode of its operation, but in vain. I examined other buildings in the Rhine-land, where it was said to have existed, and with as little success, until at last I began to think that I must have been listening to a fable. Many things served to support this idea. In the first place, I could obtain no references to chronicles or documents in which its existence was vouched for; and whenever I asked where I was likely to discover any traces of it, I was almost always referred to the castles of the robber-chivalry of Germany, a class of people who were generally too poor to purchase a machine so expensive as this must have been, and whose criminal justice or vengeance, call it which you will, was likely to have been administered in a much more simple and unmysterious manner. Again, the accounts which I received both of its form and movements were often inconsistent. Some represented it to be an image of the Virgin Mary, which the culprit was told to kiss, and which, on being touched by him, was set in motion by inward machinery, which caused the figure to fall down and crush him. Others said that its arms expanded and clasped him to a breast out of which poniards protruded. Others again represented it merely as an emblem of justice, placed above a trap-door, on which the culprit trod as he advanced to pay her his homage, and which, being left unbolted, sank underneath his weight, and precipitated him into an abyss. The tradition relative to the machine contained in the tower at Mayence represented it to be a sort of hollow wheel, furnished in the inside with knives, which, on being made to turn round rapidly, cut to pieces anything that might be in the inside. This last was a punishment reserved for persons of gentle blood convicted of high treason against the Elector, but persons of inferior birth were simply beheaded and thrown to the dogs.

It is true that one could not wonder at a total silence respecting it in the books of criminal jurisprudence of the empire, for they related to punishments which justice openly acknowledged, while this machine was always represented to be the peculiar and appropriate minister of a secret tribunal, which, from its very nature, could not be governed by any public system of law; but the difficulty of obtaining evidence respecting it, and the contradictory and consequently unsatisfactory nature of the little that I did for some time obtain, made me begin to treat the stories which I had heard as the result of popular error. Added to this, I found almost all the members of the modern school of philosophy prepared to treat the thing as an old woman's tale; and one of them (to whom I was recommended as a man of great historical erudition, who had achieved his education at Paris and was said to enjoy the intimacy and esteem of the most distinguished philosophers there and elsewhere) told me that the whole affair was a mere monkish lie; that every possible instrument of death and torture was to be found in the Bastile; that when the people cleared it out at the Revolution they found no Virgin; and that therefore it was fair to conclude that the thing had never existed but in the imagination of monks and romancers. I remember asking him whether any monk had really mentioned it in a written document. He replied in the affirmative, but stated that, as the monks wrote nothing but lies, he never suffered their stories to dwell on his mind sufficiently to enable him to refer to them a second time. I have stated thus much, at the risk of being tedious, merely to show with what facility we are often led to attribute to mistake and falsehood that which is nevertheless well founded in fact.

Discouraged as I was by the result of my inquiries, I could not altogether hold the thing to be utterly without basis. A grain of truth is often to be found in the most stupid superstitions, even in the most malignant calumnies; and, being loath to treat as mere idle rumour that which had been heard of by every German, and was believed by the great majority of the people, I was tempted to take a middle course, between belief and unbelief, and to conclude that the Virgin must have been the plank or German guillotine, and I mention this circumstance because I have strong ground for believing that both instruments are often confounded in ancient traditions.

The conclusion which I had arrived at was, however, disturbed by a passage which I accidentally met with in a book entitled "Materialien zur Nürnbergischen Geschichte herausgegeben von D. I. C. Siebenkees," (Nürnberg, 1792). The passage in question is represented to have been extracted from a chronicle (which the author has not indicated), and may be thus rendered in English:—"In the year of our Lord 1533 the Iron Virgin was constructed for the punishment of evil-doers within the wall of the Froschthurm (or Frogs' Tower) opposite the place called Die Sieben Zeiler (that is to say, the Seven Ropers); so at least it was publicly given out to justify the thing. Therein was an iron statue 7 feet high, which stretched abroad both its arms in the face of the criminal, and death by this machine was said to send the poor sinner to the fishes. For so soon as the executioner moved the step on which it stood it hewed, with broad hand swords, the criminal into little pieces, which were swallowed by fishes in hidden waters. Such secret tribunals," continues the author by way of comment on the foregoing extract, "existed formerly in many countries. I do not, however, know whether any traces yet remain of the one here described, and I have never read that any use was ever made of it; perhaps the whole affair may be nothing more than a legend."

In May 1832 curiosity led me to Nuremberg, for I had a long time been desirous of visiting a city so celebrated for its antiquities. I was addressed to a person there, said to be distinguished amongst the most enlightened of his fellow-citizens, and who gave me this answer to my inquiries relative to the Virgin. "I have heard of such a thing, but doubt whether it ever existed here. Popular taste in every age has hunted after the marvellous; and here, as in other countries, there have not been wanting foresters to start game for it. If such a machine ever existed in Nuremberg, it must have been at the town hall, where there are yet to be seen the prisons which were formerly made use of in our city: but I doubt whether you will find it there. Such a thing is much more likely to be found in some of the castles in the neighbourhood."

I went accordingly to the town hall, and although I found no Virgin, I found other things which perfectly satisfied me that the old patrician citizens of Nuremberg had no right to ascribe to themselves feelings of humanity superior to those of the old robber-chivalry, who I have generally observed to be a sort of scapegoat amongst the Germans of the present day, and to be accused of almost every vice and violence which distinguished the age in which they lived. Far be it from me to think the ancient magistrates of Nuremberg worse than those of any other city; but we shall see in the sequel with what charity and moderation the high privileges of the Imperial Corporations were exercised. On asking to see the old dungeons of the town hall, I was taken to a place there called the "Lock," or hole, and a horrid hole it was. After a descent of about fifteen or sixteen narrow and rapid stairs, I found myself in a passage which led into a subterranean corridor. Here, on the left hand of the entrance, was a machine very similar to our stocks, which in Germany is commonly called a fiddle. It is a fiddle, however, which must have produced most horrid music; for it was there that those persons who had the misfortune to fall under the suspicion of the old city government received their first notions of its paternal administration of justice, by being invited to confess the crimes laid to their charge, through the silent but persuasive eloquence of thumb-screws and thorn-collars. I was told, indeed, that the accused was merely obliged to wait here till he was introduced to the torture-chamber; but there was something in the form of the bench where he sat which told a different story. I refer to two round holes on which the culprits were obliged to sit, and which plainly showed that the purposes for which they were placed there were expected to derange the animal economy of their bodies, and that convenience and cleanliness rendered such apertures necessary.

On each side of the corridor were prisons, little more than 6 feet square, completely dark and cased with oak; such material affording more security than a stone wall, in consequence of the difficulty of removing planks without noise being greater than that of disturbing bricks and mortar. But any apprehension of escape must have been uncalled for, because the culprits appeared to have been usually chained to the oaken benches which served them for beds. In most of the dungeons was a heavy square stone, about a foot high, the middle of which was hollowed out into the shape of a funnel. This seemed

at first to be intended as a receptacle for fire, but my conductor told me it was intended to serve the purposes of nature. The mind recoils with horror and disgust at the bare idea of a man being subjected to such confinement in such a place and in such an atmosphere. Either the patricians must have had no fellow feeling for those they governed, or else close air and foul smells had formerly not the same effect on our health and nerves as they now have. A little further on there was a torture-chamber, yet containing, in an imperfect state, the stretching machine or perpendicular rack, and in a vault still further on, and which was also occasionally used as a torture-chamber, there were two stone weights, one of fifty pounds and the other of a hundred, which used to be attached to the ankles of the persons who were put to this variety of the question. "Some years back," said my conductor, "a complete torture-apparatus, boots, collars, thumb-screws and all other appurtenances were to be seen here, but they have since been removed and sold for old iron."

Near the entrance of the vault in which I found the stone weights was a stone door. "That," said my guide (who was an old man and had been from his youth upwards the guardian of these regions), "leads to the subterranean passages which were formerly the place of refuge of the patricians in time of tumult or other danger. Each of them had a secret door leading from the cellar of his house into these passages, by means of which he could escape and remain there till any danger which threatened him had passed away. The chief of every patrician family was bound by oath to keep secret the position and existence of such door, and to wall it up if ever misfortune or necessity should oblige him to part with his house to any one who was not of his own order. There are a great many of these passages, and some of them are extremely long and have never been thoroughly explored. It is said that one of them goes under the wall and ditch of our city, and has a secret outlet at some place in the surrounding country where there was formerly a wood."

My curiosity was piqued to see something of these passages, and, having procured fresh lights, we selected one of them and entered. It was narrow and well rivetted with brick. After walking four or five hundred yards we came to a place where the ceiling had been repaired and covered with plaster, on which the workmen had marked the initials of their names while the plaster was wet and added a date of 1592. About fifty yards further on were two reservoirs, made on either side of the wall, for the purpose of holding water in which fish might be kept alive for the maintenance of those who had taken refuge here. The passage afterwards went about a hundred yards further on until it was stopped in front by a solid rock. Up to this point it was nearly straight, horizontal, perfectly dry and in good repair, but on arriving at the rock it turned round, at right angles, and had only one side rivetted, the rock forming the other side. Here it became lower and very irregular in width, and, after pursuing it for about forty or fifty paces further, we were obliged to stop in consequence of the mud which had been caused by the land-water draining through the rock, and which, the further we went, got deeper and deeper and extremely inconvenient to us. We returned therefore towards the daylight, and although in retracing our steps I observed passages shooting off in different directions I did not attempt to explore any of them, for my guide not only confessed his inability to tell me where they led, but assured me that there was no one in the city who knew more on that subject than himself.



The Nuremberg Virgin.

But the Virgin, for I had neither forgotten nor abandoned her. After what I had seen there was no reason to believe that the humanity of the ancient magistrates of Nuremberg would have been particularly abstemious in employing her, however completely disconnected they may have been with the predatory gentry of the surrounding country. The Virgin was nowhere to be found in the vaults of the town hall, and, according to my guide, she had never been there. He said, however, that he had frequently heard that such a machine had been formerly employed, and that he recollected that the women, when he was a boy, used to still their children by saying to them, "I'll give thee to the Virgin." I asked him whether he thought it was in the Froschthurm, but he answered me positively in the negative, and said that he did not believe there was any place near the Sieben Zeiler where it could possibly be deposited. "But," added he, "if you wish to know anything particular about such a matter you had better go to Dr. Mayer, who is the keeper of the archives; he can tell you more about such matters than any one here." I went to him accordingly.

Dr. Mayer told me that the passage from the chronicle

quoted by Siebenkees was no fable, that the machine had formerly stood in a vault near to the Sieben Zeiler, and that he himself had seen part of the machinery which belonged to it, although the figure itself had disappeared. "The figure," said he, "stood at the brink of a trap-door, and when the individual who had suffered by its embraces was released from them, he fell downwards through it on a sort of cradle of swords, placed in a vault underneath, and which were arranged so as to cut his body into pieces, which dropped into running water over which the machine stood." He could not tell me the precise manner in which this machine operated, but said that he understood it to have been thus: two wooden cylinders were placed parallel to each other, so as to extend right across the inferior vault; into the front of each of these cylinders were screwed a great many iron blades, which projected in the face of each other, and crossed each other like scissor-blades; and into the rear of the same cylinders were screwed an equal number of curved bars of iron. The cylinders, being thus armed, were put in equilibrio by means of weights and by placing the ends of the bars on strong beams, so that, when anything heavy fell from above on the blades, they were put in motion, and made to perform a cutting movement. I need not say that in this manner the body of a man must have been soon minced to pieces.

Desirous of seeing the spot where the Virgin stood, I procured permission to visit it from the city architect, who sent me the keys by a man named Kiefer. This man had been a long time in the employment of the magistrates, and he accompanied Dr. Mayer and myself to the spot in question. He was a stranger to Dr. Mayer, but he had himself, many years back, been in the vaults whither we were proceeding, and he gave me an account of what he had seen there, which corroborated perfectly that which I had previously heard from Dr. Mayer; and he added that, having descended into the undermost vault, he found the two beams yet remaining, and that there were holes in them into which the blades, with which they were formerly furnished, had been evidently screwed. He found no stream of water there, although the place was extremely wet and damp; and on one side of the vault, which was drier than the other, there was a sort of grave in which were many human skulls and bones. I asked him whether he had ever known anyone who had seen the machine in a perfect state. He answered me in the affirmative, and told me that, in his youth, he had known an old man named Kaiferlin who had seen it so, and that he had heard from this person that there was formerly a stream of water which flowed through the lower vault. He stated also that this Kaiferlin told him (and I beg the reader's attention to this fact) that two or three days before the entry of the French into Nuremberg, the Virgin and all the instruments of torture formerly kept in the place where she was were taken away by night in a cart, and that neither she nor they had ever been heard of since.

(*To be continued.*)

CHURCH BUILDING AND RESTORATION.

Sudborough.—Works of restoration have been carried out at All Saints' Church, under the direction of Mr. J. C. Traylen, of Stamford, diocesan surveyor. The work carried out has been the entire reroofing in oak of the nave, the south transept and south aisle; the reslating and underpinning of the north transept; the rebuilding of the south-east angle of south transept, and the replacement of one of the four pillars of the nave. The tower has also been reroofed, the battlements raised, the pinnacles (of late date) renewed and the walls repaired. The body of the church has been refloored with wood-blocks and made level with the stonework of the nave and aisles and new oak seats placed in the nave. The church is lighted with lamps from the design of the architect and supplied by Messrs. Ellgood Bros., of Leicester. The contractors for the work were Messrs. E. Roberts & Son, of Weedon.

Dublin.—The foundation-stone of the proposed new façade in Halston Street of St. Michan's Catholic church, North Anne Street, has been laid. The new façade will be in accordance with a handsome design in Gothic architecture by Mr. George C. Ashlin, and the other work in connection with the design will, it is estimated, cost about 3,200*l.* The old parochial house has been removed, and the old church will be enlarged by 30 feet. On the Halston Street side it will afford additional sitting accommodation for 200 people. The façade will comprise a chancel 62 feet wide, an embattled tower 86 feet high, with a turret reaching a height of 110 feet. Alderman Toole has taken the work in hand. The walls will be of ashlar, with the masonry in picked Finglas limestone. The dressings, window-tracery, mullions and door-jambs will be in chiselled Kilkenny limestone. There will be two entrances from Halston Street to the sanctuary. The chancel will be lighted by a perpendicular Gothic window of six bays, with transoms and elaborate tracery. The window of the chapel, tower and bell-chamber will be of two bays with tracery.

Bladon.—The church of St. Martin has just been reopened after renovation and enlargement. The architect was Sir Arthur Blomfield, A.R.A., whose designs have been carefully carried out by Mr. Alfred Groves, of Milton-under-Wychwood. In place of the former plain, if not ugly, structure, there is now a beautiful church.

Selattyn.—The foundation-stone of a north aisle to be added to the ancient parish church has been laid. The aisle will be divided from the nave by an arcade of four bays. The roof will be covered with red Ruabon tiles. The stonework will consist of local stone, with red Shelvock stone dressings. The work is being carried out from designs by Mr. Hodgson Fowler, of Durham, by Mr. R. Yates, of Shifnal, the clerk of works being Mr. T. A. Bolton.

GENERAL.

Mr. H. S. Marks's picture of *A Select Committee*, exhibited at the last Royal Academy Exhibition, has been purchased by the Liverpool Corporation for the permanent collection of the Walker Art Gallery.

The Prince Regent of Bavaria has confirmed the nominations of MM. Bouguereau and Oscar Roty, the French painters, as honorary members of the Münich Academy of Art.

An Exhibition of Water-Colour Drawings by Turner, lent by the Trustees of the National Gallery, will be held in the Ruskin Museum, Sheffield, during next month.

The New English Art Club will open the Winter Exhibition on Saturday, the 28th inst.

A Mosaic, attributed to Orcagna, has lately been placed in the Italian Court of the South Kensington Museum. The subject is the Birth of the Virgin, the panel being from the right-hand lateral doorway of Orvieto Cathedral.

A Brass Pulpit, designed by Sir Arthur Blomfield, A.R.A., has been placed in Burghclere Church as a memorial of the late Earl of Carnarvon.

The Dundee Fine Art Exhibition will be opened on Saturday by the Marquis of Lothian.

A Stained-glass Window in memory of the late Charles Carmichael, architect, has been unveiled in the east parish church, Aberdeen.

Mr. P. H. Rathbone on Tuesday gave a lecture in the Rotunda Lecture Hall at Liverpool on "Art as a Necessity of Civilised National Life." Before concluding, he alluded to the architecture of St. George's Hall, the value of the edifice to the town, and how that value would be increased if the hall were completed.

The Candidates for the chair in the Académie des Beaux-Arts, rendered vacant by the death of Elie Delaunay, are MM. Edouard Détaille, Jules Lefebvre, Joseph Blanc, Aimé Morot and Luc-Olivier Merson.

The Important Architectural Competition for the new National Bank, Pretoria, South Africa, has been recently decided, and the plans sent in by the firm of Messrs. Frank Emley & Frank Scott, architects, Pretoria, have been placed first.

The American Institute of Architects have adopted a silver button bearing the letters A. I. A. as a badge of membership.

The Edinburgh Architectural Association held the opening meeting on Thursday, when Mr. John Kinross, president, delivered his inaugural address.

The Restoration of Llangwyfan Church is proposed to be carried out under the direction of Messrs. Arthur Baker & Hughes, architects, of Bangor. The building is at present roofless, but the walls generally are in good condition.

The Surveyors' Institution meet on Monday, the 23rd inst., when Mr. J. R. Adams will read a paper on the "Title to Land, its Registration and Transfer."

Lord Burton has offered to the Corporation of Burton-on-Trent a block of buildings, comprising St. Paul's Institute and a club, for municipal buildings. The block is the finest in the borough, and was built by the late Mr. Bass, at a cost of between 30,000*l.* and 40,000*l.* The offer has been unanimously accepted. Views of the buildings have appeared in *The Architect*.

An Appeal is made by the committee for funds to erect a memorial of Lieutenant Walter R. Pollock Hamilton, V.C., and those who fell with him at Cabul in 1879. The group by Mr. C. B. Birch, A.R.A., exhibited at the Royal Academy in 1880, now lent to the Museum of Science and Art, Dublin, representing the young officer, with his sword in the right hand and his revolver in the left, striding over the body of a prostrate Afghan, is considered by the committee to be such a fine work of art, a remarkable likeness and excellent rendering of the tragic murder of the English Embassy at Cabul, that it has been decided to commission the sculptor to carry out the work in bronze and have it erected in Dublin. The cost is estimated at 2,000 guineas.

The Architect.

THE WEEK.

IT would be advantageous if local authorities in England would attend to a judgment delivered in Edinburgh whenever they send out notices demanding that works of pavement should be executed in front of houses. The case in question related to a corner plot in Edinburgh. The owner was required by the Corporation to pave the streets on both sides. He contended that the frontage of his property was on one side only, and he should not be considered as having any responsibility on the other side. He also maintained that the notice was not sufficiently specific, and that the time allowed for the works was inadequate. The Court of Session rejected the former plea, and held that he was owner as regards both streets. With respect to the notice the Court said that the magistrates had acted upon the theory that all they had to do was to serve notices, which amounted to nothing more than a reminder to the proprietor of the terms of a section of an Act of Parliament. The notice told him that the street must be properly levelled, made up, constructed, paved and completed, but as to the manner in which the proprietor was to set to work the notice was absolutely silent. They had to consider, having regard to the alternative provisions for obtaining that the streets should be paved or causewayed, whether that was adequate compliance with the requisition or notice. It was to be observed that the statute contemplated that the proprietor was personally to be apprised of what the town called upon him to do at his own hands, and then failing his setting to work and meeting their requirements, they might do it themselves. His lordship took it that, according to the statutory provision, a proprietor was entitled first of all to learn from the magistrates what they required him specifically to do, and then he was to consider whether he could himself conveniently do that at his own hand; or whether he was not to do it, and let the second alternative of the section come into play, under which the magistrates would do it at his expense. Therefore, he thought the magistrates were bound to give, not a minute detail of the work to be done, but a sufficient indication, so that the proprietor might have the advantage of this alternative. He was clearly of opinion that these notices were bad, and that the Court ought on that ground to sustain the appeal.

THE roll of the Royal Hibernian Academy has been reduced by the deaths of three prominent members. The work of the Hon. LEWIS WINGFIELD was mainly known in England. Mr. JAMES FARRELL belonged to a family of sculptors who for many years have produced excellent portrait statutes and figures of saints, which are to be found in many Irish churches. Mr. COLLES WATKINS was the foremost of the Irish landscapists. There could be no question of his ability, and in England he would have gained fame and profit. But there was a fascination in the wild landscapes of Ireland which he could not resist, and since GEORGE PETRIE passed away he alone may be said to have caught the character of the scenes. The sadness, which is their chief characteristic, was heightened by him in many a representation of the country as it appeared in autumn. He was, in fact, a victim to his art, for during the recent gales he was chilled in one of the wildest parts of Kerry which he selected for this year's work, and suffered in a cabin far from medical aid. Mr. WATKINS was about sixty years of age, and for two-thirds of his lifetime his works were the main attractions of the exhibition of the Hibernian Academy.

THE polemic aspects of Mr. CALDERON'S Academy picture, *St. Elizabeth of Hungary*, seem to be endless. It might be said that the work has a political significance, for it formed the principal topic in the address which the Marquis of LOTHIAN, the Secretary for Scotland, delivered at the opening of the Dundee Art Exhibition on Saturday last. His lordship said that in speaking of that picture he might refer to it almost as a typical picture of what should and what should not be done in the way of pictorial art. To his mind—he had no doubt many of them had seen it and knew it—it was a most beautiful representation of the most perfect act of self-abnegation drawn or imagined by a painter. There was nothing in it to excite any feeling except that of reverence; it was beautifully painted; it was a work of art in every sense of the word, but it also had a defect. That was the good side of the picture; but it had another side, and this side he thought ninety-nine people out of every hundred would agree with him that the historical aspect of that picture was not true, and that the artist had been mistaken. That was one thing which he thought art should not give way to, however great the temptation might be to give way to such a feeling; and the other mistake was that it had certainly given rise, justifiably or unjustifiably, to feelings of regret among a large number of our Roman Catholic fellow-subjects in this country. While he looked upon it as a typical picture—a picture which had in itself and in its essence everything that was beautiful and noble—it had these two defects, the one that it was not true, and the other that it had given justifiable offence. But his lordship did not point out how a painter was to anticipate that his painting would give offence. We hope the Marquis of LOTHIAN does not adopt that principle as a rule of conduct, for if it be necessary to avoid giving offence the only escape open to an honest man is through suicide.

THE committee having charge of the grounds and buildings of the Chicago Exhibition announce that the preliminary estimates of the cost of the work are entirely inadequate to such an undertaking as the people of the United States expect to be produced under national auspices. The classification comprises exhibits on an enormous scale in departments that have heretofore either been ignored or lightly treated in great exhibitions, or made the subject of special exhibition at great expense. It is anticipated that in 1893 all branches of human industry will be included on a complete and comprehensive scale. This requires that each department should have for its installation a building and grounds such as has been previously considered unnecessary or impossible. The area embodied in the grounds will be nearly three times that of the greatest exhibition heretofore held. The separate departments of agriculture, electricity, mines and mining, horticulture and transportation especially, will each be developed on an unprecedented scale. The scope of the exhibition has grown with the progress of the works, and consequently a much larger expenditure must be anticipated. For the completion of the buildings, machinery, decoration, administration and maintenance, a sum of over twelve millions of dollars will have to be provided, organisation will cost about three and a half millions, and police, watchmen, &c., will cost one and a half millions. There are other means of outlay, and the exact sum to be expended in order to have the exhibition ready is put down as 17,825,453 dols. Unless the money is provided there must be an abandonment of some of the contemplated features.

THE old tower in Saragossa is doomed. It was erected four centuries ago, but it is still, as on its first day, the Torre Nueva. As an example of Spanish brickwork the tower is interesting enough, but to its inhabitants its importance consists in its rivalry to the Pisan structure. The Torre Nueva cannot, however, be treated as a builder's freak. If there is a departure of 9 feet from a perpendicular line it is owing to the sinking of the foundations. Cases of settlement are generally chronic, and there can be no doubt of the symptoms which are to be observed in the tower. It menaces the people who are so proud of its renown. Although it was restored thirty years since, the ground could not be made firm, and owing to the subsidences the tower was never in a worse state than it is now. The commissioners who have charge of the ancient buildings in Aragon have met and considered the reports of the architects, which state that it is no longer feasible to make the tower secure, and that the safety of the public makes demolition inevitable. But the commissioners have affection for the tower, and instead of approving of the operation they have implored the advice of the Academy of St. Ferdinand, in Madrid. But a Spanish savant needs a long period of time for deliberation, and unless an accident should occur, the tower may be visible for many months or years. The faith of the custodians in its stability continues unchanged, for they allow people to ascend to the upper platform.

THE CONVENTION OF AMERICAN ARCHITECTS.

THE Convention of the Architects of the United States, or rather of members of the American Institute, which was held during the last days of October, in Boston, was not remarkable in its proceedings, but as countries and men who have no wonderful histories are generally the happiest, the results of the twenty-fifth convention may be satisfactory to all who attended it. The president for the year was Mr. R. M. HUNT, of New York, an architect who has gained the confidence of his countrymen, and from his studies in Paris he is entitled to be considered as a representative of architecture in general. If it were not for the rule which allows only two years' occupancy of the chair, it would be well to utilise his services as long as possible. The first recommendation of Mr. HUNT related to the chapters. There has been much "high-falutin'" talk about the Institute as a sort of sublimated body that could lead an independent existence and yet perform wonders. In fact, from what has been said occasionally, it might be imagined that there was a sort of imperial condescension in accepting aid from the chapters. Mr. HUNT is too honest and clearsighted a gentleman to sanction such delusions, and he told the Convention that the life of the Institute was dependent on the vigour of the chapters—without their help little, if anything, could be accomplished. He therefore suggested that candidates should not be eligible for election to the Institute unless they were members of a chapter. Mr. HUNT also advised the exercise of aggressiveness occasionally by the chapters, and to be "ever ready to expose any scheme which, if carried out, would prove detrimental to the public good." Experience, however, shows that in America, as in Europe, the motives of architects are suspected on such occasions, and if they are eager to gain an end, it is more prudent to remain in the background. In their art the architects can assert themselves, and it is satisfactory to find from a judge so competent as Mr. HUNT saying that marked progress in design and construction is everywhere to be observed. In dealing with competitions the citizens are becoming more earnest about securing fair play, but as yet the discreditable practice of disregarding limited competitions has not died out, for uninvited architects send in designs; and the President was not too severe when he said that such action is injudicious and undignified, and tends to lower the profession. It is not surprising that when examples of sharp practice occur, architects in America who respect honour should long for the conditions of practice in Europe, which are imagined to be according to a righteous code. But in Europe there are also professional men who are never happier than when they deprive other architects of anticipated commissions, and who believe that competitions are to be gained mainly by trickery. The American architects have, as Mr. HUNT pointed out, more opportunities for practice and far more freedom in design than is allowable in Europe, and it cannot therefore be said they are without compensating advantages for the low commercialism that is degrading the profession. With all its drawbacks, the President was warranted in saying that "for centuries no fairer field has been offered for the display of architectural talent" than America.

As was to be expected from his association with the enterprise, Mr. HUNT devoted a part of his address to the Chicago Exhibition. The Advisory Board recommended, in preference to competition, a direct selection of architects for the principal buildings, but it was laid down that the gentlemen selected were to meet in conference and agree upon a general scheme of procedure. It is to be hoped that the arrangements will not be taken as precedents, for they do not correspond with ordinary practice, and the architects were restricted to office-work. According to Mr. HUNT, each architect was merely "required to furnish a general design, one set of full and complete general working drawings, and full details of all work of an artistic character connected therewith, together with such descriptions and instructions as might be necessary to elucidate fully his views as to construction and treatment, and everything relating to the construction and stability of the work was delegated to the Bureau of Construction." If the accounts which American newspapers publish are to be trusted, the Bureau's manner of construction is rather vagarious, and the materials already are exercising independence in various ways. But about those freaks Mr. HUNT was silent. He was not afraid to say that buildings of excessive height are detrimental to public health because they shut out the light and air and are injurious to the surrounding property.

The annual report of the directors described the position of the Institute (which is held in common with all architectural societies) by saying "the Institute can only recommend, cannot force upon its individual members or their clients its ideas of what constitutes good professional practice." One of the recommendations given was that there should be a written contract between an architect and his client setting forth the extent and limits of their responsibilities. With respect to competitions, which everywhere seem to create grievances, the directors begged the members to do all in their power, by precept and example, to discourage the practice of submitting sketches gratuitously or for inadequate remuneration. They were also advised to avoid all competitions of which the terms were indefinite and the awards were not satisfactorily guaranteed. Unfortunately, the American people are as indifferent as the English about the recommendations and proceedings of architectural societies. One proof is seen in the discontinuance of the committees on national buildings and architectural practice, "because of the deplorable, but quite apparent, want of interest of the public and our profession in these matters of such great importance to both." Competitions will therefore be likely to be conducted as irregularly as heretofore.

There are many other committees of the Institute that might without any apparent loss be also discontinued. The members do not appear to be acquainted with the English way of having "much ado about nothing," or it may be the American architects are not disposed to devise useless work to display their activity. At any rate, on such subjects as education, professional ethics, clerks of works, uniform contracts, conservation of public buildings, the American architects must contrive to prosper without further enlightenment. The President said, "Our committees have not been very active during the past year," but no architect at the Convention was able to state that even an office-boy suffered in consequence of the cessation of meddling during the year.

The scorn of trade and business which prevailed among the "best society" in England in the days before limited liability levelled distinctions has, like other cast-offs, found its way across the Atlantic. It will hardly be credited that the most important resolve of the Convention was the following:—"All architects who shall have been actively engaged in the honourable practice of their profession for ten years or more, and shall then have retired from active practice, *and who shall not have engaged in any business or trade*, may retain the rights and obligations of fellowship." It is not easy to understand why a society of architects should care about men who no longer practise, or why the latter should be eager to assume the obligations of fellowship which, of course, means punctual payment of subscriptions. An architect who becomes director of a trading company must pass under the ban of the resolution, as well as all who take shares. Architects who design for manufacturers will also be excommunicated, and, to be logical, the punishment should fall on those who design manufactories. Yet the members of the Institute who are so ready to show contempt of their families are pained because the inhabitants of a nation that lives by trade and business do not esteem them. Such affectation of superiority would be absurd in a girls' boarding-school, and it is pitiful to find grown men are not ashamed of taking part in an attempt to go beyond the restrictions of the caste system. But what is to be expected from those who imagine that a receipt for a subscription to the Institute is a "passport to good society"?

It might be supposed that the members who can employ the time of the meetings with childish discussions, for everybody seems to be disposed to exhibit a forgetfulness of good sense, are without important subjects which require serious consideration. But that is not the case. One of those subjects relates to the designing of Governmental buildings. In America the supervising architect is respon-

sible for more buildings than all the surveyors of the English Office of Works. The work is so onerous that of late years it is beyond the powers of any individual, and the holder of the office at the present time has tried to have some of the buildings made the subject of a competition. But in Congress there is no desire for a change, and there is opposition from underlings, who somehow possess influence. One architect who has tried to bring about a reform said:—"We found opposition from the many hangers-on of that office, and this kitchen back-door influence is very strong in Washington." The only way to insure a change is to operate on the individual Congressman, and all the members of the Institute have undertaken the mission. But the votes the Institute can command in any district are so few they are not worth considering as a political factor, and the Congressmen respect people in proportion to their influence. Having assumed that a trader or a man of business is unworthy of mixing with the members of a profession that is without legal status, the American architects must expect that efforts will not be made to increase their commissions by the representatives of trade. They have assumed superiority and must abide the consequences.

Many other instances of unwise action can be found in the history of the Institute. The result has not been fatal to art. Architecture has advanced without any aid from the Institute as an organisation, and as that fact is patent, why should Congress or any other authority in the States be moved by the talking, voting, dining and sight-seeing of conventions?

LEEDS ARCHITECTURAL SOCIETY.

ON Monday evening the sixteenth session of the Leeds and Yorkshire Architectural Society was opened with an address by Mr. W. H. Thorp, F.R.I.B.A., who had been re-elected president, at the Law Institute, Albion Place, Leeds. He remarked, the *Leeds Mercury* says, that they had completed the first year of their alliance with the Royal Institute of British Architects, and had thereby, to his mind at least, materially strengthened their position, not only as regarded themselves as a society, but they had also further justified their being in the eyes of the public. Times had been fairly prosperous, and there were few, if any, of their practising members who had not been favoured with commissions of a more or less important nature, the results of which would doubtless add to the architectural beauty of the town and county with which they were so closely associated. On other occasions he had so often dwelt upon the advantages to be derived from a study of good examples of architectural work, in the cultivation of taste and the preparation of a basis upon which to rear a superstructure of architectural knowledge and the principles of design, that it was hardly necessary for him to further enlarge upon them. If any proof were required of the desirability of this course of study, it was only necessary to think for a moment of the more brilliant members of the profession now engaged upon the design of the best examples of contemporary art, who had all, without exception, been devoted and enthusiastic followers of this branch of interesting work. Hand in hand with the artistic side of the architect's calling, the scientific claimed its due share of attention, and must by no means be neglected in favour of its more fascinating sister. He was glad to know that many of their students largely availed themselves of the classes for the study of science bearing upon the constructional part of their work that were held at the School of Art, the Yorkshire College, and other centres of technical education, and were thus acquiring valuable knowledge, which, in addition to the excellent mental training which they afford, would prove of infinite value in solving the problems which are met with continually in ordinary office work. The President then proceeded to consider the question which had created a large amount of discussion and warmly-contested argument during the past year, namely, "Architecture—an Art or a Profession?" He thought the impartial critic could not fail to admit that architecture had a twofold aspect, and to exalt the one at the expense of the other was to inflict injury on both. Noticing next the International Congress of Hygiene and Demography held in the metropolis in the month of August, at which he and Mr. W. Carby Hall, the secretary, attended as delegates, Mr. Thorp gave a brief report of the transactions of the congress from an architectural point of view. At one of the sittings of the Architectural Section, he remarked, an animated discussion took place on the merits—or rather, he should say, the demerits—of "back-to-back" houses, and great surprise was expressed that in an important town like Leeds such dwellings should be permitted. It was hardly necessary to mention that the opinion of the meeting was in direct opposition to the further erection of dwellings of this type, and a resolution to that effect was carried by a large majority. Whilst upon the subject of hygiene, and remembering that sanitation had been so much to the fore of late, he would mention that the Yorkshire College had succeeded in establishing a lectureship of "Sanitary Science," and Mr. Spink, civil engineer, of Manchester, had been appointed to that post. They would recollect, a year ago or thereabouts, in considering the question of architectural education, the council of the college were approached with the request that they should provide instruction in sanitary science, and also arrange for efficient scientific teaching as to the use of iron and steel in building structures. As regards the former subject, doubtless a similar request was made by other societies interested in the subject, so that they could hardly claim the honour of taking the lead in that beneficial movement, but at all events they had had an important share in it, and had shown their interest in the practical shape of a grant of ten guineas from the funds of the society in aid of that new venture. It might be he would be accused of blowing the society's trumpet in calling attention to that fact, and if that be the case the consequence must rest upon his shoulders; but he did so with the express desire that the public should be made aware that the architects of Leeds were by no means indifferent to the importance of the question, and that they would give all the encouragement they could to the furtherance of a knowledge of the principles of sanitary science and the laws of health. They would probably remember that a year ago, on the occasion of his last presidential address, he took the opportunity of making a few remarks as to his views upon the published design for the Leeds new Post Office, and in doing so was not able to speak altogether in its favour. It was not his wish in any way to reflect upon the ability of the architect to the Department, who was probably hampered by considerations of expense in his architectural treatment of the building, and thereby had been unable to do justice to the fine opportunity placed within his reach; on the other hand, knowing the inhabitants of the town, after exercising their patience for many years, were expecting a beautiful edifice to take the place of the Old Cloth Hall—a building of no architectural style and renowned for its ugliness—he felt justified in questioning whether the design if carried out as an example of architecture would take its due place amongst the finest buildings of the town, and be worthy of the splendid site upon which it was to be erected. The sentiments then expressed appeared to be in accordance with the general feeling in the town. The question was taken up by the Borough Council and the Leeds Chamber of Commerce, and their desires, together with those of the society, for a reconsideration of the design were forwarded to the Department in London. He alluded to the deputation which waited upon the late Postmaster-General with reference to the subject, and to the revised design which was afterwards forwarded to the Leeds Corporation for approval, remarking that upon inspecting the drawings they found that although a good deal of similarity existed between the old and the revised proposals, a material improvement had been effected, and a more dignified and monumental character imparted to the building. One or two of its features still gave rise to comments not entirely of a favourable nature. These were noted, and suggestions were made for their improvement. Reviewing the circumstances of the case, he thought they had reason to be satisfied with the action taken by that society and the other bodies with whom it had been associated in the movement; and, should the new Post Office not quite come up to the ideal of their expectations, they would feel it had not been from any lack of effort on their part to improve the architecture of the town. The square opened out by the demolition of the Old Coloured Cloth Hall had now been cleared, and when the Quebec property was removed the finest improvement that Leeds had seen for many years would be an accomplished fact. Bounded on its eastern side by the picturesque group of Gothic buildings formed by the Royal Exchange and Mill Hill Chapel and Schools, on the south by the classical frontage of the Yorkshire Banking Company's Bank, and on the west by the new Post Office, the square should not be without architectural attractions. It now only remained for the Midland Railway Company to improve the approach to their station, and for the old Court-house on the north either to be purged from its excrescences or to give place to a more modern erection to complete the surroundings of this fine open space. But there was another square to which he wished to draw their attention, that bore the name of their most gracious Sovereign Lady, Queen Victoria. The square itself he was not going to find fault with, although he was no admirer of its cast-iron fountain, and he could wish the statue of Wellington was balanced on the western side by a similar monument to some other well-known celebrity. Nor was it Cuthbert Broderick's masterpiece, which dominated its northern side, which called for any but favourable criticism on his part; for notwithstanding the fact that it was thirty-three years since the Town Hall was opened by the Queen, it was still, without exception, the finest building which

Leeds possessed. But what could be said in favour of its neighbours on the south and west sides of the square, and could it for a moment be asserted that they were calculated to produce feelings of admiration on the part of the spectators? It would perhaps be unwise of him to single out any particular building as more worthy of condemnation than the others, but it would be a pleasure to see the College of Music rejoicing under a more attractive exterior and the outer shell of the Oxford Place Chapel transfigured into "a thing of beauty and a joy for ever." Were it determined to raze some of these offending structures to the ground and in their place erect some buildings worthier of the position, he did not think the Thoresby Society would waste much time on unavailing lamentations or the Society for the Protection of Ancient Buildings organise a crusade in their defence.

After remarks by Mr. Hart (Wakefield), Mr. G. B. Bulmer moved a vote of thanks to the President for his address. Referring to the new Post Office, he remarked that it was a great thing for their society to be able to say that it had been invited to take part in the matter, and that the representations which it had the pleasure of making before the Postmaster-General had been effectual in giving them a distinct and substantial improvement in the character of the design for the Post Office.

Mr. E. J. Dodgshun, in seconding the resolution, said the President had alluded to Victoria Square and to some buildings which he would like to see replaced.

Mr. W. Watson (Wakefield), in supporting, thanked the members of the Association for electing him a member of the Council.

ARCHITECTURE—A PROFESSION OR AN ART?

THE following letters have appeared in the *Times* in succession to Mr. Norman Shaw's already published, and to one by Mr. Woodward:—

Mr. W. White, F.S.A.

I for one am not disposed to quarrel with Mr. Norman Shaw for his high view of art, but I think he unfairly depreciates the endeavour of the Royal Institute of British Architects to enable all its future members to exercise their "art" successfully, and without bringing it into discredit by want of that further branch of culture needful to enable them properly to fulfil their duties to the public as constructors and scientists. The Institute does not profess to manufacture artists, or to cultivate, or to test, art by its examinations, but merely to insure the acquirement of all those elements of construction and arrangement without which the architect, whether true artist or not, must fail to satisfy the requirements of a civilised community. Amongst the elements which constitute the "artist" must be enumerated perception, memory, genius, sentiment, poetry and imagination. These qualities must be innate, though to some extent capable of expansion or repression by education. Without them the architect cannot properly be termed an "artist." But in addition to all these the architect needs a great deal more. He must be conversant with the higher forms of geometry and science generally. Added to genius he must have a large capacity for ingenuity, a fund of general information, and a considerable amount of what Vitruvius calls "Ratiocination." Without a full complement of these things perhaps a man may not be entitled to the name of architect. But the higher cultivation of them, through the efforts of the Institute, so far as they are capable of being imparted or tested, ought not to be set down as derogatory to the one body in England which aims at a higher standard of education than has for centuries been considered necessary to the architect. If the Royal Academy be content to teach the art of architecture *minus* certain essential elements necessary for its appreciation or practice, without which the art of architecture is practically a nonentity, let not the Institute's endeavour to teach these elements be set down as propagating mere professionalism, or for the cultivation of a business capacity; the absence of which, indeed, is no very great merit even in the sublime artist. When a man has obtained his diploma the public will soon discover whether he have or not enough of the artist in him to carry out their commissions. And doubtless there are some who might maliciously suggest it to be an ungracious act to attempt to saddle "t'other boy" with misleading the public, when the Institute aims at supplying an essential need in the education of an architect, which the Academy itself fails to attempt or even to promote.

Mr. T. G. Jackson.

Mr. Woodward, by way of reply to Mr. Norman Shaw's letter in your issue of the 11th, dresses up once more for public warning the lay figure of the "art architect," which has so often amused his brethren of the Royal Institute of British Architects. He represents him as a man who leaves his construction to the engineer and his business to the surveyor and the commission-agent, keeping the artistic part only for himself. The original of Mr. Woodward's dummy, however, never existed save in the imagination of himself and his friends. Mr. Norman Shaw and those who think with him certainly maintain that the pursuit of architecture has nothing in common with the business of the surveyor and commission-agent. Mr. Woodward thinks it has. We contend that if a man occupied himself with land-jobbing, negotiating ground-leases, floating building speculations, conducting arbitrations and deciding questions of light and air—matters which have as much to do with architecture as orange-planting in Florida—the dregs of his time which remain will never suffice to make him a tolerable architect. Mr. Woodward and the Royal Institute of British Architects think differently. And as to construction, it is quite true we maintain that mere skill in construction which is enough for the engineer will not be enough for the architect; but we do so not because we undervalue construction, but because we hold that architectural construction must be not only scientific but something more—that is to say, artistic. In our opinion good construction is a necessary condition of good architecture—*cela va sans dire*. Experience proves that the best architects are masters of construction; and though Mr. Woodward may not be what he calls an "art architect," but poses as "the practical man," he must forgive my doubting whether he is qualified to give a lesson in construction to Mr. Norman Shaw.

Mr. Woodward.

Two or three years ago Mr. T. G. Jackson gave a lecture to the members of the Architectural Association and preached the same pernicious doctrine which Mr. Norman Shaw again formulates, giving encouragement to the student of architecture to neglect the constructive and scientific parts of his professional education and confine himself more to what Mr. Jackson is pleased to term the "art" portion of his studies. I expressed at 9 Conduit Street on that occasion the same sentiments as those by which I am still moved, the danger to young men (many of them would be only too willing to get rid of the laborious part of their studies) being quite apparent. With reference to Mr. Jackson's letter in the *Times* of the 17th, may I remark that I never suggested that I was "qualified to give a lesson in construction to Mr. Norman Shaw"? But permit me to add that I have no inclination to go to either of them for lessons in construction or in any other branch of an architect's business. I yield to none in a sincere veneration and regard for art in its highest form, in music, painting, sculpture and architecture; but I cannot stand quietly by and see men riding off on the cant of art, kicking up as they go mud at that Institute which is doing its best to make the architect a master of his business in all its branches. Mr. Jackson accuses me of dressing up a "lay figure" and bringing forward a "dummy." I urged that the architect was in the habit of handing over, at the cost of his client, a great part of his functions to the "specialist." Now, will Mr. Jackson carefully watch my "lay figure" and see whether it moves or shows signs of vitality? Is he or is he not aware that the following important parts of an architect's business are frequently executed by the "specialist?" Is it true that:—

1. The whole of the drainage and sanitary works of the building are designed, drawn and specified by the sanitary plumber?

2. The whole of the constructional ironwork parts of the building are drawn calculated and specified by the building engineer?

3. The whole of the internal decorative wood and plasterwork is designed in detail and specified by certain decorative firms?

4. The whole of the painted decorative work is designed by the art decorator?

5. That, in order to produce these designs and specifications, the "specialist" is bound to employ a staff of clever and artistic draughtsmen, and that the cost of those men is added to the price of the work upon which the architect receives his 5 per cent., and which the client supposes that the architect himself has designed and specified?

Well, what is the serious outcome of all this, apart from the deceit practised upon the client? I say that the architect who so conducts his business goes upon the building utterly ignorant of what he should be thoroughly well up in, and would have been had he paid some attention to the work himself; he knows nothing about the "specification," he has lost touch completely with the building, and he is left bare in the hands of others, free to admire his own beautiful cut-brick ornament and his artistic terra-cotta panels. I do not think that a Wren, a Barry, a Smirke, a Pennethorne, or a Street thought as Mr. Jackson thinks; I rather believe that in their own offices, and not in the shops and offices of others, were the drawings made and the specifications written embracing the whole structure from foundation to finish. With all due deference to Mr. Norman Shaw and to Mr. Jackson—for both of whom I entertain feelings of personal regard—I prefer to stand by the definition of an architect as laid down by our immediate past president, Mr. Alfred Waterhouse, R.A., and endorsed by our present presi-

dent, Mr. Macvicar Anderson, viz. "an artist, a man of science and a man of business." I have more confidence in such a man as an architect than in the emotional, maudlin designer of original ugliness, household furniture, paperhangings and table-covers.

Mr. W. H. Seth-Smith.

It is clear that either the Royal Institute of British Architects, with its now well-established system of compulsory examinations for its own membership, is altogether on the wrong road, or that Mr. Norman Shaw and his friends, who memorialised the Institute against this system, are mistaken in their view that architecture is an art "on precisely the same footing as painting and sculpture." Those with whom I have the honour of being associated in the promotion of the movement for the legal examination of all persons calling themselves architects agree with the Institute, but desire to see the examinations made compulsory in future upon the entire profession, and conducted by a paid staff of examiners; and we further desire that the R.I.B.A., as the senior and leading professional body, should draft and introduce such a measure to Parliament. Now for our reasons for agreeing with the examination policy of the Institute. Mr. Norman Shaw is correct in stating that at the present time there are three branches of professional work performed by men calling themselves architects, and we perfectly agree with him in holding that the artistic qualification is essential to a proper claim to that title, but hold that the constructional side is inseparable from the artistic, and we are convinced that a well-balanced examination in both the science and the art of architecture will have the very, and very desirable, effect aimed at by Mr. Shaw, namely, of preventing men who are exclusively utilitarian constructors, or men of business, from using the title of architect. The tests imposed by the Royal Academy prove that it is possible and expedient to examine men in matters of taste, and I for one would not advocate any system of examination in architecture which excluded the test of the existence of a sufficient degree of designing power (and skill in representing ideas) to insure the public against such costly disappointments as are now only too terribly common.

As regards artistic specialism, we believe that it is impracticable to separate these three branches of practice, except in the case of a very limited number of men in the metropolis and large provincial centres, just as in medical science the vast majority of men are compelled to be general practitioners. In all such matters we have to consider the question, not in the light of its bearing upon a small class of men, but for the general good; and when a man has qualified by passing the general examination he can become a specialist either in art or in science. It is to be feared that the architect is, generally speaking, called in not so much to guide in matters of taste as to secure good planning, construction and sanitation, and it is in the exercise of his skill in these foundations of good architecture that he finds his opportunity for designing beautiful things, whereas the tendency of Mr. Norman Shaw's arguments is to reduce the architect to a mere decorator employed by the engineer or builder. It is a lamentable fact also that art has contributed next to nothing to the vast advantages which engineering construction has conferred upon the public, and the reputation of science has suffered proportionately among men of Mr. Norman Shaw's type. But, supposing that engineers had studied architectural art, and architects had imbibed something more of the bold inventive spirit of the engineer, our Empire would not be disfigured, as it is everywhere to-day, with grossly utilitarian erections on the one hand, and with ornamental plagiarisms, caricatures and deceptions on the other. We believe that such a union would have done more for architectural art than anything else could have done. The professor of architecture at the Royal Academy is perfectly right in saying that for the last 300 years architects have been groping in the dark, and that it is only in combination with constructional science that we can expect living and lasting progress in our art.

Mr. J. M. Brydon.

There can be little doubt that Mr. Norman Shaw and Mr. Jackson are in the right in their contention that architecture is an art, but where they seem to labour under a mistake is in supposing that the Institute is opposed to them in this conclusion. The Institute is not now proposing, and never has proposed, any restriction on any man becoming an architect; in point of fact it has steadily opposed, hitherto with success, all the efforts that have yet been made to induce Parliament to legislate on the subject. It has been insinuated that its action in this respect has been taken with the object of promoting some analogous scheme of its own. Nothing can be further from the truth, and it is as well this should be made known as widely as possible. An endeavour has been made—wisely or not may be a matter of opinion—to raise the standard of architectural education, but—and this should be made perfectly clear—the Institute grants no diplomas of architecture whatever. What has been done is simply this, to impose an examination for all candidates for associateship in its ranks. The wisdom of this is again a matter of opinion, but the examination qualifies for nothing at all save entrance to the Institute as an Associate, and carries with it no diploma of any kind. The student who passes it does not necessarily become a member of the Institute. Many do not; their names are simply printed in the list of those who pass, and afterwards, if they wish to join, they must be put up for election in the usual way. Now, there is a great and wide difference between a private society imposing conditions on those who seek admission to its ranks and the same society dictating terms to all who may prefer to work outside of it. Surely that must be obvious to everyone, and has nothing to do with the question whether architecture is a profession or an art.

I am quite aware that there is a proposal to extend the system of examinations to those who wish to become Fellows of the Institute, as well as to the Associates, but that in the meantime is only a proposal, and this is not the place to discuss it. In spite also of the special pleading in its favour in the President's opening address, it is nevertheless a proposal on which the "authorities" of the Institute are so hopelessly divided that there is little chance of anything of the kind being carried out for years to come, if at all, and even if it were it would only apply to men who may desire to join the Institute and could place no restrictions whatever on any one outside of it. But further, if Mr. Norman Shaw and Mr. Jackson and their friends outside the Institute who think all such examinations detrimental to the true interests of architecture as a fine art would, instead of writing acrimonious letters, come in and help their friends, and they are many, inside the Institute who agree with them in the main, the examinations they so strongly object to would be relegated to the Greek Kalends, registration cease from troubling and "professionalism" be set at rest. Can they not for once forget the claims of party, forget the little differences which must always exist among men even of the same calling and make one great united effort for the commonweal? Mr. Norman Shaw, Mr. Jackson and half a dozen other men one might mention could influence the whole policy of the Institute and give it an impetus which would be felt throughout the length and breadth of the land. It is no manner of use inveighing against the Institute; we must take facts as we find them, and the Institute is a great fact, existing for much more important ends than examining its would-be Associates. It is not perfect any more than the Royal Academy, especially to architects, is perfect, but it can be made better by a broad, liberal-minded policy, the very opposite of the narrow ways of examinations. Its future is not alone in the hands of those within, but also of those without. Mr. Shaw and his brilliant friends as representing the latter can do much—no men more—to help forward all progress that makes for the advancement of the art they love. May I appeal to them to come and help us? The result will proclaim their strength, as it will be their reward.

THE SOCIETY OF ARCHITECTS.

A MEETING of the Society of Architects was held on Tuesday, when Mr. G. A. T. Middleton read a paper on "The Society's Excursion into Belgium," in August last. As ample reports of the visit were published during its progress, there is no necessity to give a copy of the paper. Mr. Middleton, in conclusion, said the tour had been a success in every way, largely due to exceptional facilities given everywhere, and particularly by His Majesty the King of the Belgians; while it was felt that an important step in advance had been taken in thus securing the meeting of the architects of England and those of another country, a step which cannot but be to the interest of architects and architecture generally, securing to each country the advantage of the research and skill of the architects of the other. Of little less value, too, is the close intercourse engendered during such a tour between the architects of different parts of England, tending to a widening of sympathies and the unification of practice, while to all who took part in it the excursion must have left behind a feeling of pleasure only—a pleasant summer holiday, spent in pleasant company, and with a definite object in view such as gives the greatest zest to pleasure, apt to pall if sought for its own sake alone.

TESSERÆ.

An Ancient Thames Embankment.

IN the early part of March 1824, the clearing the bed of the river was commenced previous to the driving of the piles for the coffer-dams for the new London Bridge. This object was accomplished by means of dredging. In the course of the operation a number of miscellaneous articles were dragged up consisting of coins of the Roman, Saxon and early English era, ancient seals, a crucifix, brooches, gold rings (all of the

Middle Age), ancient daggers and swords, brass and iron keys, amulets, and a few implements of domestic use supposed to have been lost from the dwellings which formerly stood upon the ancient bridge. On the north-eastern side of the new bridge, now occupied by the stairs on the surface of the bed of the river, which consisted apparently of burnt ruins, were found between thirty and forty gold half-sovereigns and angels of the seventh and eighth Henries, and in the line of the river near the site of the chapel-starling was found a leaden seal or bulla, inscribed "P. P. Urbanus VI.," the reverse exhibiting the heads of St. Peter and St. Paul. In clearing away the crypt of the Prior of Lewes Inn in Southwark to form the new line of roadway another bulla was discovered in good preservation inscribed "P. P. Clemens VI." Many Roman coins were met with and a great variety of others of the Lower Empire. Saxon and English coins were found in great abundance. There was besides a great variety of jettons or counters of brass and other base metal, and many private tokens of tradesmen resident in the neighbourhood. The ancient embankment of the Thames showed itself on the northern side of the river. The exterior embankment next the stream was constructed vertically, and built with Kentish rag and Purbeck stone in courses and in a manner similar to the piers of the late ancient original bridge. It was backed by quantities of chalk and madrepore, the latter probably brought as ballast in vessels. Within this embankment for nearly 100 feet several small jetties forming docks and quays appeared, which were doubtless at some time landing and discharging places. Proceeding northwards the ground was found to be a mass of marsh extending from the river's edge about 300 feet onwards, evidently from its having once formed part of the bed of the Thames. It shelved up towards Thames Street, and was excavated from 10 to 20 feet deep at that part to find a safe foundation for laying the south abutment of the land-arch built across Thames Street. Here the first timber embankment was discovered, and was found about 10 feet below the surface of the ground. It was traced to the depth of more than 20 feet, and was formed of large solid trees of oak and chestnut about 2 feet square roughly hewn, having strong timber waleings spiked to the piles, the whole being of great strength and massive. The timber composing this embankment was perfectly sound. The second embankment was discovered about 60 feet beyond the north side of the Thames towards the site of Crooked Lane, and was of a completely different character from the one just described. It was composed of elm piles from 8 to 10 feet long closely driven together, and being further in shore than the former and of a totally different description, must have been constructed at some other period. It was in clearing away these old embankments and in going to an additional depth for the construction of the great sewer which runs through the centre of the new northern approach to the river, that a large quantity of fine red Roman ware was discovered at the average depth of about 18 feet below the surface, both plain and ornamented, together with fragments of Roman amphoræ, vases, tazzas, crucibles, lamps, bottles of glass, and one small pavement of red tesseræ. This last was found on the site of Crooked Lane about 10 feet below the surface of the street. A similar pavement was discovered on the south side of the river, near which were found Roman coins in good preservation. In the excavations crossing the line of Great Eastcheap an evidently Roman construction presented itself, which from its form and contiguity to Watling Street led to the conclusion that this must have been part of the celebrated Roman road. It consisted of two walls 7 feet 6 inches high, tapering a little upwards, built in rough courses of Kentish rag stone, and separated by two layers of Roman tiles, the latter two courses breaking joints and binding throughout the wall. The average dimensions of these tiles were 16⅔ inches by 11½ inches, and about 2 inches thick. These walls supported a raised bank or road about 16 feet wide, and stood upon a stratum of loam. Below this, to the depth of 20 feet, was found the hard native gravel which forms the rise of the land here; under this was the same species of blue or London clay which constitutes the bed of the river at this spot.

Roofing of York Cathedral.

York Minster affords a curious negative proof of the advantages and disadvantages of the stone vault. The latest architects of York, to whom we are indebted for the grandest interior in this kingdom, could not confine themselves to the usual limits of English cathedrals, and at the same time could not afford the immense additional expense of exceeding those limits in a safe legitimate way. They substituted a fabric of timber in imitation of a stone vault, which by its lightness admitted of greater width and a more elegant style of architecture, and by running up into the valley of the roof obtained an unprecedented height. In consequence of this, the choir of that minster, exclusive of the aisles, is about 20 feet higher and 6 or 7 feet wider than the average of that part of English cathedrals. People who have recently stood gazing with awe and wonder up that glorious vista are sure to feel disappointment when they enter the sister pile of Lincoln, or any other cathedral. They feel a want of space and height. The architect of York succeeded entirely as far as grandeur of effect is concerned. However, this was obtained at a great sacrifice. The timber imitation of vaulting, so far from being, like stone, any additional security against fire, increases the danger, by bringing near one another two complex frames of wood, two piles of fuel. When the incendiary Martin set fire to the choir, had the vault above been of stone, the organ and all the lofty stall-work would have blazed away like faggots in a baker's oven, and the fire would soon have spent its fury without doing any further mischief to the edifice itself but what a few buckets of whitewash would have set right. As it was, the first wreath of flame that reached to the wooden arch above spread like lightning through the roof, and made the destruction of the whole choir inevitable. Again, at a later time, the burning timber inside one of the west towers fell down to the floor, and would there have burnt out but for the inflammable nature of the vaulting over the nave. It is true that extraordinary precaution and watching may provide against such a misfortune (and certainly such a roof requires that they should never be intermitted), yet the fate of York Minster puts that style of roof quite out of question for the future. It also shows that any double frame of woodwork, such as that universally in use for the last century, containing an inner ceiling of lath and plaster, is more liable to such catastrophes than the single framework of an open roof.

Palimpsest Brasses.

The attention of every one who has been interested in researches into the sepulchral antiquities, either of the Classical or the Mediæval period, must have been called to observe the wanton recklessness with which the memorials of one generation have been displaced to make way for those of a succeeding age, and the materials appropriated to the purposes of the occasion. Numerous are the instances that might be cited where sepulchral brasses have thus been sacrilegiously perverted from their original purpose; indeed, among the limited number of memorials of this kind of which, by their having been detached from the monumental slab, the reverse can be seen, the number of those which are found to be engraved on both sides is proportionally so large, that it might be assumed that the greater part of our sepulchral brasses would be found, were it possible to ascertain the fact, made up of fragments of prior memorials of the dead. In cases of this kind the term Palimpsest Brass seems to be not an inappropriate designation. In the chancel at Hedgerley there is a sepulchral brass which represents Margaret Bulstrode, the wife of a gentleman of the family of that name formerly possessed of estates in several parts of the county. The inscription under her feet records October 1, 1540, as the date of her demise; her costume is the ordinary dress of the time of Henry VIII. Beneath are seen a numerous little family of ten sons and three daughters, and above the bearing of Bulstrode, quarterly with two other coats, impaling a single bearing, which would serve to identify the individual. The plate on which the inscription had been graven having become detached from the sepulchral slab, it was found that the reverse presented a memorial of a period two centuries anterior to the date of the secondary application; and fortunately, the piece of brass having required an addition of some inches in length, in order to receive the later inscription, the earlier has been preserved without mutilation. It consists of the following distich:—

Totyngton Thomas Edmundi qui fuit Abbas
Hic jacet, esto pia sibi ductrix virgo Maria.

This simple record, and the pious aspiration whereby it is accompanied, appear to have formed the entire memorial of the deceased Abbot of St. Edmund's Bury. There is no apparent reason for supposing that the plate had been reduced in size; but it must be remarked that the character seems to be of a time later than the demise of Abbot Totyngton, and the brevity of the memorial may have been owing to the circumstance of its having been affixed some years after his death, merely to mark the spot where his remains rested. Thomas de Totyngton succeeded John de Norwold in 1301; he had previously been sub-prior of St. Edmund's Bury, and he presided over that powerful and wealthy establishment during ten years. It was on November 4, 1539, that John Reve, the last Abbot of St. Edmund's Bury, surrendered his charge. From the reports of the Commissioners, gold and silver ornaments were appropriated to the amount of 5,000 marks. The discovery at Hedgerley is a fearful testimony as to the rapidity with which the work of spoliation proceeded, for the brass of Abbot Totyngton, which formed part of the spoils, was again turned to account for a memorial in the succeeding year. It is needless to mention numerous examples that are to be found of sepulchral brasses which, like that at Hedgerley, have been employed for a secondary purpose. In some instances, the design that is found on the reverse may have been rejected on account of some defect of design or workmanship. A curious example of this kind occurs at St. Margaret's, Rochester, where the representa-

tion of a vicar of the church, who died in 1465, is found on both sides of the plate, the only difference being slight variations in the ecclesiastical costume, the first having evidently presented some impropriety in that respect, for which it was cancelled, and the figure given in due form on the other side. A similar example is afforded by the brass of an ecclesiastic at Burwell, Cambridgeshire. Palimpsest brasses are also found at Berkhampstead, at Cuxton, Kent, and St. Peter's in the East, Oxford, an account of which was communicated by Dr. Ingram to the *Gentleman's Magazine*, 1841. There are likewise two at Isleworth, one of which exhibits on the reverse Flemish words, engraved in a peculiar character used in sepulchral memorials in the Netherlands. As brass plate was exclusively procured from the Continent until works were established for its manufacture in England in the seventeenth century, it may be readily understood how this portion of a memorial, which had either been cancelled by the engraver or suffered desecration, should have reached this country. At Bromham, in Bedfordshire, are fine brasses representing Thomas Wideville, who died about the year 1435, and his two wives, in the costume proper to the times of Henry VI. These, by an extraordinary reappropriation, have been employed a hundred years later to supply a memorial for the descendant, in the fourth generation, of the sister of the individual for whom they had been originally designed, namely, for Sir John Dyve, who died in 1535, his mother, and his wife. This curious monument has been engraved for Lyson's "Bedfordshire."

Limitations of Glass Painting.

All productions of art are properly subject to two restrictions—the nature of their materials and the nature of the human eye. In glass painting we have to do with an art which is especially connected with those of architecture and of picture: with the former as an adjunct and ornament; with the latter as a sister art of colour and design. The nature of glass itself differs from anything else that those arts have to do with. Both these arts are based on definite principles and bound by definite limitations. Let a picture be black as night or fresh as morning, severe or sketchy, it will be good only if it have not transgressed the laws of chiaroscuro, of transparent and opaque colours, of colour in relation to light and shade, and of texture in relation to proximity or distance, and of linear and atmospheric perspective. Those involve principles that are inviolable, and beyond those limitations no good work ever was or ever can be produced. They are the natural laws of the materials in relation to the eye. The other art, architecture, whether Classic, Gothic, modern, or aught else, has equally its laws and limits. It cannot without ruin transgress the powers of its own materials, nor can it, without offence, violate that science of numbers (the very soul of art, including that of music) which we call proportion. Is, then, glass painting to be free of all control—the only art let loose in the vanity of unmitigated fancy? A complaint commonly made by glass painters is that, if their art be tied by old restrictions, they have no opportunity of raising it. They demand freedom for "high art." But, on a closer questioning, it is found that few of such complainants have studied general art principles at all extensively; and that, in the detail, knowledge and drawing of the figure, upon the perfect acquaintance with which "high art" entirely depends, both their education and practice are still more at fault. The complaint, therefore, resolves itself into little else than impatience of the conditions of the art they profess. If only they would recognise the dignity of their own beautiful art, and work within the sphere of "glass" without wandering into that of canvas, and exert their powers in perfect truth of form and in that use of colour which distinguishes a window painter's glass from a picture painter's palette, we should then happily arrive at an art as "high" as the artist can produce, and one made perfect by being perfectly consistent with itself.

Poppy-Heads.

In the contract for Beauchamp Chapel, Warwick (Ap. Gloss.) A.D. 1450, we find mention of "a pair of desks of timber, *poppies*, seats, sils, &c." It is not improbable that the term in this instance is meant to include the entire seat-end; but it is more reasonable to attribute this to a loose use of the term proper to the surmounting ornament than to any idea so far-fetched and so uncountenanced by Mediæval usage as that of the resemblance to the poop of a ship. Again, in Hearne's Glastonbury, "for the makyng off the dextis (*i.e.* of the desks) in the liberary (of Christ Church, Oxford) . . . after the maner and forme as they be in Magdalen College (*i.e.* we presume in the chapel), except the *popie-heedes* off (of) the seites." This notice is interesting, as it seems to imply that the "popie-heede" was looked upon as an ornament proper to a church seat only, and not to be used in the more secular "liberary." The form of the word does not, in this its current Mediæval form, differ materially from its modern one: "poppie," "popie," and "poppy" are all one. Neither does it seem to approximate more to the French *poupée* or Latin *pupa*, But when we find that *poppæa* was one of the forms which "pupa" had assumed in the Latin of the Middle Ages, we cannot doubt that this, and no other, is the true original of "poppie." Yet we must not hastily draw the conclusion that it was from its resemblance to a "puppet" or doll that the name was given to it. For, in fact, the poppy-head is very seldom, though it is sometimes, in the form of a human figure; an instance occurs in St. Andrew, Chesterton, Cambridgeshire. And if "poppy" meant merely a small statue, there is no conceivable reason why all figures in niches, &c., as well as on the ends of seats, should not have been so called; but of this there is no trace whatever. It is to a secondary sense of this class of words, then, and that a very curious one, that we must have recourse in order to understand how the ornament we are considering came to derive its name from this source. *Pupa* (and its Mediæval form, *poppæa*) is explained in the ordinary dictionaries as "statuncula *vestibus amicta*" (v. Facciol., Du Cange); in fact, it was rather "clouts," rudely formed into some resemblance to a human figure, than an image so carved. Hence the term came to be used for any small bundle similarly tied up. *Poupée* is explained in Roquefort's Mediæval Dictionary as "botte"—a word still in use in French, to express "a rag tied round a cut finger"; and accordingly Roquefort further defines *poupée* as "faisceau de lin, ou de chanvre." It was especially used of a bundle or handful of the last-mentioned substance (Fr. *chanvre*; Mediæval, *canbe*; Lat. *cannabis*; Engl. *hemp*). This is frequently mentioned as a feudal payment: "quatuor *paupadæ* (or *manadæ*, handfuls; or *cerri*, curls) de canbe." It is clear, then, that this class of words (pupa, poppæa, paupada, poupée, poppie, popie) would be very likely to be applied to anything which presented the appearance of being tied together in the middle, and thence curling over above and perhaps below also. Now this is on the whole a fair description of poppy-heads of all sorts, and an exact description of some. And the supposition we thus arrive at is simply this, that a small "puppet-like" bundle of this kind being familiarly called "a poppie" in the Middle Ages, the workmen gave this name to the bunch surmounting the ends of seats in churches. And, on this supposition, it clearly appears not only why figures in niches, &c., were never called "poppies," but also (which is at first sight more unaccountable) why the name was never extended to the bunches of foliage surmounting crocketed canopies, &c. For these, as being merely produced, as it were, of necessity by the conjunction of the two or more topmost crockets, have not that distinct independent existence which is the characteristic of the "poppy," and which suggested the name, by its resemblance to an isolated bundle or handful of anything.

Sacristies.

The details in the sacristy may be of a less ecclesiastical character than those admitted into the church itself. It may be questioned whether this license is to be extended to more dignified churches. There cannot be an objection to a fireplace and a chimney in a sacristy; let them be boldly and undisguisedly treated. Still a too secular style has been sometimes admitted. Aumbryes and a piscina are wanted in a sacristy. It would seem that there is little authority for an external door to a sacristy. An example remains, and that an eastern one, at St. Mary, Bitton, Gloucestershire; a late and anomalous example, the sacristy standing, moreover, in the middle of the north side of the chancel. There is much convenience in having a separate door now. It ought not, however, to open on the east side. External doors were not commonanciently, perhaps for the greater security of the sacred vessels and ornaments which were kept in the sacristy, perhaps because they would go far to make a priest's door useless. The latter need not be dispensed with if a separate door to the sacristy be allowed. Respecting large or town churches the rules are not so stringent. In these the sacristies may be in any convenient situation, of course nearer the altar than otherwise. Thus, at St. Mary Redcliffe they are on the north side, and have an upper storey of rooms fitted for residence; in the abbey church of St. Mary, Tewkesbury, they are beautifully-vaulted apartments to the south. In such churches the sacristy ought to glow with colour and ornaments no less than the more sacred parts of the building. The sacristies at S. Miniato, Florence, and Sta Maria Gloriosa de' Frari, Venice—the first south of the south chancel aisle, the latter south of the south transept—are remarkable examples. St. Anastasia, Verona, has a noble sacristy, north of the north transept. The Duomo at Milan has sacristies north and south, an arrangement adopted, not unhappily, in St. Paul's, London. At Cologne they lie to the north, and the detached sacristies at St. Peter's, Rome, lie also to the north of the north transept. On the whole the north, for dignified churches also, is the better side. The vestries of the churches in London built after the great fire, which provoke many a sneer from superficial observers for their supposed comfort, are rather to be regarded as instances wherein the architects have mastered the true idea of what they were building, placing it where most convenient, fitting it for its various uses and making it a not unworthy appendage to their costly churches.

NOTES AND COMMENTS.

It is remarkable how often the Irish people when they get a chance will repudiate the right of a man to do what he likes with his own property. As becomes Celts, they have a lurking belief that property is not an institution for individuals. A case that will amaze English surveyors and others was decided a few days ago in Dublin, which exemplifies the national but narrow way of looking at things. The Dublin Corporation were authorised to construct a market, and the owners of three houses that were required in order to obtain a site declined to come to terms with the Corporation, and it was necessary to go through the usual routine for such cases, and have the value determined by arbitration. The sum awarded was 516*l.* The owner was dissatisfied, and his case was brought before a judge and jury. At the trial it was stated that the value of the houses was enhanced by an expenditure of 187*l.* upon them when it was known that they were likely to be required by the Corporation. The opposition of the owner to the purchase would, however, appear to show that he contemplated the possibility of retaining his property, which would become valuable from its proximity to the market. The judge left it to the jury to determine whether the expenditure was inspired by a desire to make a larger claim. The jury, as became Irish ratepayers, decided in the affirmative, and the award was consequently reduced to 316*l.* The unlucky owner brought his case to a higher Court, when, fortunately for him, it was held that the judge was wrong in leaving to the jury the question whether the 187*l.* expended in repairs was or was not a *bonâ-fide* expenditure, that an owner dealing with his own property had a right to expend any money he liked up to the time of the appointment of the arbitrator. Their lordships directed that the sum of 187*l.* should be added to the 316*l.*, the amount of the award found by the jury. It will be seen that the owner receives only 503*l.* It is needless to say the decision of the Irish Queen's Bench Division corresponds with English views, for every day people are endeavouring to make the most of their property and there is no law to prohibit their foresight.

The last meeting of the Manchester Architectural Association was held on the 17th inst., as it has been amalgamated with the Manchester Society of Architects, that sadly needed some young and earnest members. It is announced that the library, bookcase, minute and letter books of the Association are made over to the Society, but it is to be hoped that with the new members something more will be transferred, otherwise there is not much hope for architecture in Manchester. As the Society had lost its importance, it is no wonder some members of the Association were dissatisfied with the arrangements. But the Association committee were eager to have only one Society, and they succeeded in "making arrangements that the work of the Association should be as efficiently carried out by the new Society as by the Association, and that every member of the Association should have the opportunity of joining the new Society." It is to be earnestly desired that under the new conditions the Society of Architects will gain respect in Manchester. The treatment by the Corporation of the petition from the members about the church-tower on a late occasion reveals the state of local opinion upon the Society, and it was therefore time to bring about a change. That has been done, and with wise management the reformed Society will no doubt be able to render some service to the profession.

The direction of civil buildings and national palaces is attached in France to the Ministry of Public Instruction and Fine Arts, along with the historic monuments, theatres, archives and museums. It is now intended to transfer the civil buildings and palaces to the Minister of Public Works. There will be a reorganisation of the service. At present, in addition to the bureaux of direction, there is a council that is constituted by eight architects, four of them being inspectors-general, who are permanent members, and the remainder being *architectes en chef* who have charge of buildings. Henceforth the inspectors-general, who will be selected from the *architectes en chef*, will receive 6,000 frs. a year, but each of them is to retire when he reaches his seventieth year. Each will have charge of a division of the service, and united they will form a consulting committee. By special permission, an inspector-general may complete any work entrusted to him before his election, but he is to receive no more new commissions for national works unless he wins them in public competitions. The *architectes en chef* will be selected by the minister from the class below—that is, the inspectors—and their fees will be 4 per cent. on works of conservation and 3 per cent. on new works. Seventy years will place them also on the retired list. The inspectors are to be drawn from Prix de Rome men, or from sub-inspectors, and the latter class can be recruited by competition. The "contrôleurs" and "vérificateurs" will also be selected by competition. It will be seen that by the scheme it is sought to combine two principles; one is the right of winners of the Prix de Rome to office, the second is public competition. It remains to be seen whether both will have equal weight in the selection of officials.

It has been found necessary to close the library of the Edinburgh Architectural Association. This step could not be avoided, for it appears the books are disappearing. The committee cannot persuade themselves that there are thieves among the members, and therefore it is assumed that the books are retained through carelessness or forgetfulness. As the volumes are inscribed on several pages with the title of the Association their commercial value cannot be much, and when removed it could hardly be with the expectation of selling them. But some men are strong in acquisitiveness and exercise it without hope of gain, and it is not amazing to learn that a short time ago two volumes bearing the stamp of the Association were found in an auction-room among the books of a deceased member and were only withdrawn from sale and restored on being claimed by the secretary of the Association. Probably the deceased member was the son of an Edinburgh hotel or shop-keeper, in which case his propensity can be easily understood. About twenty-five volumes have disappeared, and as some of them can at any time be bought for a shilling or two the removal of them would be inexplicable unless we believe the old northern principle survives, "that they should take who have the power and they should keep who can."

Hitherto the State manufactory of porcelain at Sèvres has been controlled by an artist, or a chemist, or a potter. Generally the chemists were selected, for there is continually expectation of gaining some improvement in colours or in the preparation of the materials by the aid of science. As for art, there is always a superabundance of men who are able to represent it, although the authorities may not believe in their capacity for direction. The scheme, which may now be said to be settled, revolutionises the old arrangements. There will be no official presiding over the establishment as a whole. The directors of design, chemistry and administration will be independent, and it is anticipated there will be no difficulty about their co-operation. M. Vogt will be the chemist and chief potter, and from his experience there is no doubt his appointment will be approved in the manufactory. It is likely that M. Joseph Chéret, who served as substitute during the illness of the late Carrier-Belleuse, will be the director for art. M. Baumgard is to be entrusted with the administration of the establishment.

It appears that in one of the principal London club-houses the cockroach nuisance has enormously increased in the kitchens and other hot places in the building since the wires for the electric light were carried across the kitchens. The cockroaches eat their way into the wooden casing, and live at ease in the grooves along which the wires are laid. The ordinary warfare which is carried on in all great kitchens against cockroaches and other insect plagues has no effect when the enemies are protected by casings. They increase and multiply in security, sally out at night in their thousands, and colonise other parts of the kitchen. It has been found that the only remedy is to take down the wooden casing where it is carried over stoves or hot-plates, or in any position where the heat is great, and replace it with lead or compo tubes to carry the wires. The ends of the tube should, of course, be well stopped with some tar compound. The tube ought also to be carried on strong brackets several inches clear of the wall and ceiling, so as not to afford any cover for insects.



ST MARKS·ENGLISH·CHVRCH·FLORENCE·

27th 1891.





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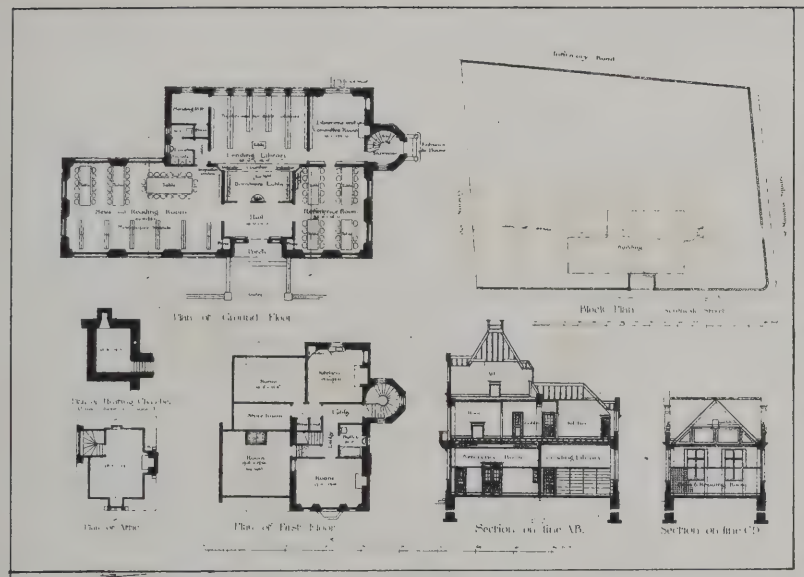
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House of La Reine Berthe, Chartres

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Plan of Ground Floor
Block Plan
Plan of Attic
Plan of First Floor
Section on line AB.
Section on line CD

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ILLUSTRATIONS.

ALTAR AND REREDOS IN ENGLISH CHURCH, FLORENCE.

THE works shown in the illustration are recent additions to the English Church dedicated to St. Mark, in the Via Maggio, Florence. The altar is of marble and is surmounted by a reredos of carved and gilded woodwork, with three paintings in the style of the old Florentine altar-pieces of the Cinquecento. The paintings are in egg tempera, with a great deal of gilded ornament in relief. The form of the altar-piece was determined by the existence of a stained-glass window which could not be blocked up. The available space was consequently very limited. Signor Venzi, of Florence, executed the wood-carving and gilding, and the whole work was carried out from the designs of Mr. George Jeffery and under his direction.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 439.—HOTEL CUJAS, BOURGES. [H. WILSON.]
NO. 440.—HOUSE OF LA REINE BERTHE, CHARTRES. [H. WILSON.]

FREE PUBLIC LIBRARY, BRECHIN.

THE illustration is a reproduction from the design submitted under the motto "Fleur de Lys" in the late competition by Mr. McLellan Fairley, of Edinburgh, and which was adopted and is about to be carried out. The principal front faces Southesk Street, and a side entrance from St. Ninian's Square gives access to the house. The rooms are arranged on the axial system, consequently no space is lost in passages or corridors, and the whole can be supervised by the attendant at the borrowers' counter. The hall, which is approached by the principal entrance, is 18 feet by 9 feet; the news-room and reading-room is 40 feet by 22 feet; the reference and magazine-room is 22 feet by 18 feet; the lending library is 25 feet by 18 feet, and the librarian's and committee-room 18 feet by 14 feet 6 inches.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the opening meeting of the current session of the Edinburgh Association Mr. James Bruce gave notice of motion for next meeting as follows:—"That this Association, as taking a deep interest in the careful preservation of the ancient buildings of Scotland, particularly of those in or near Edinburgh, has observed with great satisfaction that the Marquis of Lothian has recently been personally present at an examination of the present condition of the Royal Palace of Linlithgow, which has been in a roofless state since the fire of 1746; that the Association feels that the buildings of the Palace are at present in a critical state, and expresses a hope that, without delay, such steps will be taken by Government as will prevent the further internal decay of the Palace through exposure to the weather, and remove the imminent risk of part of the masonry falling and thereby causing serious destruction to the remainder of the fabric." In his inaugural address, Mr. John Kinross, the president, stated that at present there was a membership in the Association of about three hundred, and a balance at credit of ordinary account of 75*l*. He explained in detail the steps taken by a committee appointed in the beginning of the year towards furthering a scheme of education in applied art by the establishment of a school of design. The committee, it appeared, issued a circular on the subject and invited subscriptions with the view of raising 2,000*l*., so as to defray the cost of classes for a period of five years from the outset, the subjects of study proposed including architecture, decoration, sculpture, wood-carving, metal-work, &c. A very gratifying response had been made to the appeal, donations and subscriptions representing 1,385*l*. having been received by the end of April last. Assurances had also been received that the scheme was favourably entertained by the Board of Manufactures, and that it had the hearty approval of the Secretary for Scotland, while the necessary accommodation had been set apart for the Association and the classes in the rooms formerly occupied by the Museum of Antiquities in the Royal Institution. The Association might, therefore, congratulate itself on seeing a new career of usefulness opening up, and also on having a home worthy of the objects to which its members were devoted. Professor Baldwin Brown, in moving a vote of thanks to the President for his address, proposed that the Association had heard with great pleasure of the progress made in regard to the proposed School of Design, and viewed with the heartiest approval the proceedings already taken. He remarked that he should like to see, as part of the system of the proposed School of Design, arrangements made for a certain amount of practical work, sufficient to bring the student into touch with the genius of the materials. Mr. H. F. Kerr seconded the motion, which was adopted.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE third lecture of the session was given by Mr. Archibald Macpherson, vice-president of the Edinburgh Architectural Association, his subject being "The Scottish Mansions." The president, Mr. William J. Anderson, occupied the chair. The paper was an historical sketch of the development of the dwelling-house from the keep or fortress. The period from which this movement dates, as observable in the specimens extant, cannot be put much earlier than the beginning of the fifteenth century. Timber structures were more common than is sometimes supposed, but these we know of only by meagre description. A number of illustrations of typical examples were shown, if noticeable for the vigour of architectural treatment not less for the primitive arrangements that must have made comfort next to impossible. What the exact social conditions of these early times were it is not quite easy to determine, as historians differ—some painting a picture of people rude and barbarous in the extreme. Various authorities were quoted by Mr. Macpherson, whose opinion serves to modify this view, but hardly explains satisfactorily how a nation, not over wealthy, not far behind other European countries in its appreciation of art and learning, should yet have remained so long content with its poor and inconvenient dwellings.

ST. PETER'S ABBEY, GLOUCESTER.

A LECTURE was given in the chapter-house to the Gloucester Cathedral Society by Mr. W. H. St. John Hope, F.S.A., secretary of the Society of Antiquaries, entitled "Notes on the Buildings of St. Peter's Abbey, Gloucester."

The Very Rev. the Dean, who presided, in introducing the lecturer (according to the *Gloucester Chronicle*) said most of them had been brought up with the idea that the great minsters of old were nothing but hives of drones; but, after considering the question, they had come to see that the monks occupied a special and peculiar position, and that in these minsters everything that was noble and pure in literature, art and religion was concentrated; that, figuratively speaking, during long ages of war and rapine they floated on the storm-waves safe and inviolate among all the elements of destruction around them. He had come to know, as many of them had, that in those great houses of prayer and praise and thought and study everything that thinking, praying men deemed valuable and precious was preserved. He hardly dared to think what the world would have been during the eleventh, twelfth, thirteenth, fourteenth and fifteenth centuries without those great homes. They must look upon them as occupying the position of schools, hospitals and refuges for the poor and sick and sinful on the one hand, and as homes of learning on the other. It was of great importance to the thinker, the earnest religious man, the artist and the architect to know something of the buildings composing these great houses and of their use. He had therefore thought that one lecture at least of the course to be given for the society should be on the buildings of their great abbey of St. Peter, which Mr. Freeman had pronounced almost unique. They had asked one of the foremost men, Mr. St. John Hope, to tell them what a great Benedictine house they had.

Mr. St. John Hope first explained the drawings he exhibited, which showed the ground plan of the cathedral and the old buildings surrounding it which formerly existed, whose foundations had been traced, and also similar drawings of the great Benedictine houses of Canterbury, Durham and Westminster. Following Professor Willis's plan, he had first gone into details given in old documents, and then he had examined the remains of the buildings themselves. Rites, an ancient scribe of Durham, had left on record a large number of details appertaining to the buildings attached to Durham Cathedral, and the uses made of them, and these particulars were valuable, because they equally applied to similar buildings elsewhere. The lecturer, in reading his elaborate paper, traced the successive changes made in Gloucester Cathedral from its foundation in 681, and the numerous buildings surrounding it. He pointed out on the drawings the position of these, and entered into a variety of details concerning them. He described the chapter-house and cloisters in some detail, especially referring to the north cloister, which was appropriated to novices, and the beautiful lavatory it contained, which was so well preserved, and to the marks which were still visible on the walls of games which had been indulged in. The stonework outside this was,

in his opinion, connected with the waterworks; but this and much connected with the water supply to the various other buildings must remain at present undecided, as a good deal had yet to be made out. There seemed to have been two supplies, one for drinking and washing distributed by pipes to where it was wanted, and the other for turning a mill. Among the rooms he described was "the king's chamber," so called from its sumptuousness, and the bakehouse, brewhouse, casual wards for pilgrims, &c. Many of these buildings were of early thirteenth-century date, and though much of them was destroyed that which remained showed good work. Lengthy as were the details given by the lecturer, he remarked in conclusion that there were several others he ought to have gone into, but he felt that his "Notes" had already grown to a most dreadful length, and so he would say so more about them.

The Dean said he was sure they hardly knew how to express their gratitude to Mr. St. John Hope for his able and exhaustive paper, which suggested two or three things to him. First, as to the life of the monks, he noticed that he only used the word "comfort" once. He (the Dean) wanted the audience to see what a stern life theirs was. After they had been fifty years leading those hard lives, then they had quarters which afforded them some comfort. Amongst the "blessings" which England received from the abolition of these monasteries (he did not by any means wish it to be inferred that they ought to have been retained, because after the invention of the printing-press their great work was done) was that which had developed into the Union Poor-house and our Poor Law administration, which he believed was one of the greatest curses with which the country was afflicted. Another thing which struck him was the wanton destruction of our forefathers. The Abbots' Camera, built in the fourteenth century, was literally swept away—what a blessing it was that they didn't touch the Deanery. And yet there were persons alive who could have told them much about the remains if they had been left. This must not interfere with the vote of thanks he proposed to Mr. St. John Hope.

ANTIQUARIAN DISCOVERIES NEAR ALEXANDRIA.

THE Cairo correspondent of the *Times* writes as follows :—In the *Times* of October 12 appeared a brief telegraphic announcement of the late interesting antiquarian discoveries at Abukir, distant 13½ miles by rail eastward from Alexandria. Excavations are being continued under the direction of Daninos Pasha, a *savant* well qualified for the work, to whom is due the merit of the discoveries; and, if Government will supply the funds necessary to enable him to continue his researches, there are abundant indications that valuable "finds" will be made in a locality hitherto almost neglected by archæologists, and presenting much that is interesting, especially to students of the Græco-Roman period.

At four to six feet below the surface the diggers found three statues in rose granite, ten feet high, lying faces downwards, amongst the ruins of a temple, of which part of the outer wall with lower portions of columns and several square yards of flooring have been laid bare. The statues had been originally erected at or within the temple, and one of them is lying in front of its pedestal, which is about three feet high. They represent in a group, according to the hieroglyphic inscription, Rameses II. (the Greek Sesostris) and his Queen Hentmara seated. The third statue is of Rameses II. in an upright posture, wearing a pleated tunic, bracelets, military crown, and a girdle bearing the inscription, "Beloved of Seth." At his left side he holds a sceptre, surmounted by the head of his son Menephtah (the Pharaoh of the Exodus), whose cartouch is inscribed on the sceptre. On the plinth at his back, which is of equal height with the statue, is chiselled a bas-relief of Queen Hentmara in profile, wearing a pleated tunic and the Royal tress. The inscription above her head is "Daughter of the King—beloved of her father—Royal spouse—great favourite Hentmara." On the back of the plinth is carved the Royal banner of Rameses II., with all his known titles and appellations. The execution of the three statues is in the plain, vigorous style of the 12th Dynasty. The feet of Rameses, which had been broken off in one piece with a clean fracture, were found at a few yards distance. The two heads of the group have also been broken off, and are being searched for.

It is surmised that the temple and statues were overthrown after the edict of Theodosius, A.D. 380, abolishing the Egyptian religion, but nothing has yet been discovered to identify the temple with any of those known to have existed during the Egyptian or Græco-Roman periods. Dr. Neroutsos Bey's interpretation of the inscription is—Hentmara, daughter of the King, beloved of her father (*i.e.* the preceding king, Osiris Menephtah, who was father of both Rameses and Hentmara), Royal spouse (of Rameses II.), the (referring also to Rameses) great favourite of Seth.

The Pharaohs, following the example of Osiris, King of the Gods, and his sister Isis, had the prerogative of espousing their own sisters, and this custom, consecrated by both the civil and religious law, was followed in several instances by the Ptolemies.

Dr. Neroutsos, who is a well-known Egyptologist, has lately published a work, entitled "L'Ancienne Alexandrie," embodying his researches, made during a long residence, and he is perhaps the greatest living authority upon the topography of the ancient city and neighbourhood of Alexandria. Referring to the locality in which the above-mentioned antiquities were found, and which abounds with remains of old buildings, he recommends that explorers should seek to identify—

1. The small Egyptian town Menouth, with its temple to Isis, and subterranean burial-places. Such a place has just been discovered by Daninos Pasha, in the solid rock, entered by a vertical shaft 40 feet deep, and a sloping staircase of 45 steps, terminating at the bottom of the shaft, where a series of galleries commence, extending in length to 170 feet.

2. The Græco-Roman village Zephyrion, where stood a temple to Artemis Sotera and numerous country villas.

3. The headland Zephyrion, on the highest point of which was a temple to Venus Arsinoe, Protectress of Mariners.

4. The Byzantine monastery of St. Cyr, corrupted to Abba Kyr, whence the name of the present town of Abukir.

The monastery and neighbouring buildings were destroyed by an earthquake, followed by a tidal wave, soon after the capture of Alexandria by the Arabs. More than a dozen sphinxes and ruins of massive buildings, submerged by that catastrophe and subsequently, are now plainly visible in the shallow waters of the bay.

CITY CHURCHES.

A COMMISSION will be issued shortly, says the *City Press*, to consider and report upon the expediency of a union of St. Dunstan-in-the-East and Allhallows, Barking; but we doubt if the Commissioners will be bold enough to recommend the removal of either of these churches. The former is a magnificent pile, unequalled in its own particular style. The latter was founded by St. Erkenwald, Bishop of London, in 675, and is of the greatest interest from an architectural as well as antiquarian point of view. It is one of the few churches connected with the City which dates back in its structure to very ancient times. In it the pointed arch and clustered pillars of early Gothic have hardly yet superseded the massive column and round arches of the Norman period. The church is tolerably equally divided between the two. To recommend destruction here would be nothing short of vandalism. St George, Botolph Lane, is marked for removal—the sooner the better, for it is neither useful nor ornamental. St. Olave, Old Jewry, and St. Mary Magdalen, Knightrider Street, will soon be known by name only. St. Mildred, Bread Street, and Allhallows the Great, Thames Street, with St. Michael, Wood Street, are amongst those "marked for removal," although no positive steps have yet been taken in the matter. With regard to St. Mildred, the parishioners pronounced so strongly against a report which suggested the removal of their church, that the matter is in abeyance for a time. The following churches are now closed :—Allhallows, Upper Thames Street; St. George, Botolph Lane; St. Margaret, Lothbury (for repairs); St. Martin, Ludgate Hill; St. Mary-at-Hill, and St. Mary Magdalen, Old Fish Street. St. Mary-at-Hill is from a sanitary point of view very bad; and some think that St. Mary Woolnoth, though only reopened on All Saints Day last, will require to be again closed.

GLASGOW ARCHÆOLOGICAL SOCIETY.

THE thirty-fifth annual meeting of the Glasgow Archæological Society was held last week. Mr. John Honeyman president of the society, occupied the chair.

The annual report narrated the work done during the past session, and stated that the number of members was now 319. The Council proposed to continue the Saturday afternoon excursions with a varied programme. Mr. Honeyman, who had for more than three years filled the office of president, now resigned office, and the Council recommended the election of Prof. Ferguson, LL.D., as president for the next term of three years; and the re-election of Mr. Donald and Dr. Murray and the election of the Most Rev. Archbishop Eyre, D.D., as vice-presidents. The Council also recommended the re-election of Dr. Mackinlay, Prof. Veitch, Dr. Macdonald and Prof. Lindsay, and the election of Mr. Honeyman and Mr. George Neilson, to fill the vacancies in the Council; the re-election of Mr. J. Dalrymple Duncan and Mr. W. G. Black as hon. secretaries, and of Mr. Marwick as hon. treasurer.

This report having been adopted,

Mr. Honeyman delivered his retiring address as president,

in the course of which he said that the progress which the society had made of late years had been very remarkable. He believed that the increase in its membership had been unprecedented.

Professor Ferguson then took the chair and delivered his introductory address as president. After dealing with the scope and methods of archæological research, he said that in Glasgow they were rather lacking in facilities for the comparison of antiquities. Museum facilities there were almost none. He did not say that they wanted a museum of local antiquities in Glasgow, but he felt quite safe in saying that such a museum would be extremely popular. Glasgow could never expect to make collections like those in London and Paris. The waves of history had not washed round it as they had round these great centres of life and civilisation. But Glasgow was surely old enough and as yet unmodernised enough to yield something illustrative of its past history. He was not sure that a multiplication and competition of museums was desirable. While it was of first importance that an object should find a safe resting place somewhere, it was also of importance that it should be placed alongside objects of similar character for mutual illustration. It was only by minute comparison of seemingly trivial points that one got ultimately at the truth and meaning of things to begin with, and then from that to more comprehensive views. A local museum could serve for the annals, topography, and the antiquities of a town or district more efficiently than a central museum, unless it were of the very largest dimensions. In Glasgow there were certain local antiquities, those relating to the rise and development of the place itself, maps, pictures, histories, plans, models, and a dozen different things which were of special interest to Glasgow inhabitants, but of comparatively little interest to the inhabitants of other places. To Glasgow itself one would come naturally to study its past history and antiquities rather than, say, to the British Museum or the Bodleian Library. But where would we find what we wanted? Mostly in private hands. There was no public place in the city, the property of the city, cared for and fostered by the city, where its growth and past history could be seen and followed. This seemed a suitable time for something being done, when the city had now assumed such important dimensions, when it was likely to be provided with accommodation for artistic and museum purposes commensurate with its size. But the historical side of the growth of the place was very apt to be forgotten, and that was to many persons quite as attractive as its natural history. It was to be hoped that in the new buildings a suitable portion would be allocated for a Glasgow collection. There was abundance of material—much of it very likely was lost just for want of a suitable place for keeping. Doubtless many presents would flow into it, just as into the Glasgow department of the Mitchell Library books had gone to be preserved which otherwise might have been destroyed or lost or wandered away from the place where they were first produced. There was no lack of local enthusiasm for Glasgow and its history and antiquities, and it could be very safely left in the hands of those who of recent years had written its history, edited some of its characteristic works, preserved by photographs and otherwise the remains of old houses of historic and family interest, and who had told the story of its streets and squares and public buildings. But we wanted, after all, a place where Glasgow relics could be preserved.

A vote of thanks was passed to Professor Ferguson for his address.

TECHNICAL EDUCATION.

A CIRCULAR has been issued by the Science and Art Department of the Committee of Council on Education containing some new regulations with reference to the grants for successes at science examinations held annually in April and May. The means recently placed at the disposal of local authorities under the Local Taxation (Customs and Excise) Act and the Technical Instruction Act for providing or aiding instruction, seem to render it unnecessary for the Science and Art Department to continue to give direct aid for very elementary instruction in science, which can now be more effectually organised and maintained locally. It is suggested, therefore, that the payments for imparting this instruction should, to some extent at least, not be made on the results of individual examinations, and that local authorities, with their knowledge of local needs and requirements, are in a position to make capitation grants or payments for general efficiency in a manner which a central authority, whose rules must be the same for all parts of the country, cannot adopt. It has therefore been decided that after the next May examinations the payment of 1*l.* now made for the second class in the elementary stage of each science subject shall cease. An elementary paper will continue to be set in each subject, but the results will be recorded simply as "pass" or "fail," the standard for passing being about the same as that now required for a first class—*i.e.* about 60 per cent. of the marks obtainable. With the view, however, to encourage more advanced instruction, which in the opinion of the Department does not seem to be adequately provided for at present, the payments for the advanced stage and for honours will be considerably increased. The payments on results will then be 2*l.* for a pass in the elementary stage, 5*l.* and 2*l.* 10*s.* for a first or second class respectively in the advanced stage, and 8*l.* or 4*l.* for a first or second class respectively in honours in each subject of science, and in each sub-division of theoretical mechanics, or of sound, light and heat. The exceptions are practical chemistry and mathematics, in which the grants run about 1*l.* higher in each stage. To discourage the presentation of large numbers of wholly unqualified candidates, a deduction will be made from the grant to each school on account of papers worked which do not obtain 25 per cent. of the marks. There is a proviso that if they so desire it the committee of a science school in a place in Great Britain with less than five thousand inhabitants which does not receive aid from the local authority, or of any science school in Ireland, will be allowed to continue until further notice on the present system. The effect of these regulations, it is expected, will be to largely revolutionise the arrangements under which science classes and schools are conducted, to generally raise the standards of tuition, and to force the hands of those local authorities which have not adopted the Technical Instruction Act.

ART EXHIBITION IN MELBOURNE.

IN February next an exhibition of works by contemporary British artists will be opened in Melbourne, under the direction of the Royal Anglo-Australian Society of Artists. It will include about three hundred oil and water-colour paintings, many of them by artists of eminence. Sir Frederick Leighton has lent his three black-and-white studies in drapery—*Demeter*, *Persephone* and *Solitude*—and among the other pictures will be Mr. Marcus Stone's *The First Love-Letter*, Mr. M'Whirter's *Edinburgh*, Mr. Frith's *Poverty and Wealth*, Mr. Jacomb Hood's *Daughter of Jairus*, Mr. Collier's *Lilith* and *Incantation*, and Mr. Schmalz's *Faithful unto Death*. Among other artists represented will be Mr. Alma-Tadema, Mr. E. Waterlow, Mr. J. W. Waterhouse, Mr. Solomons, Mr. Frank Dillon and Mr. Fahey. There will also be a German room, containing about sixty pictures by representative German artists.

ARCHITECTS' CERTIFICATES.

ON Monday the case Elmes *v.* Burgh Market Company came again before Mr. Justice Vaughan Williams. It had been heard at Nottingham, when his lordship described it as follows in the course of his judgment:—This is an action brought by a contractor for the balance of money alleged to be due to him for works executed by him for the defendants. The first defence raised is that, under the contract, a certificate from the surveyor appointed under the contract is a condition precedent to the plaintiff's right of action, and that no such certificate has been obtained. The plaintiff relies upon a certificate dated November 22, 1890, which is in the following terms:—"Works at Burgh Market, Spilsby, November 22, 1890.—J. W. Thimbleby, Esq. I, the undersigned, do certify that Thomas Elmes is entitled to receive the sum of 127*l.* in payment of final instalment of contract after maintenance of the above-named works. 127*l.*—(Signed) J. B. Butcher, architect." Two objections are taken by the defendants to this certificate—first, it is said that it is not such a certificate as is required by the contract that the whole of the works were in a complete and satisfactory state; and, secondly, it is said that the person who gave the certificate was not at the time of giving it surveyor within the meaning of the contract. I am inclined to think that the first objection is on the authority of Morgan *v.* Birnie (6 Bingham, 672) a good objection; for the document of November 22 seems to me to be a mere statement of account, and not the required certificate. I further think it doubtful whether the person giving the certificate continued to be the surveyor for the purpose of certifying after his discharge, which occurred before November 22, although there are some grounds for saying that "surveyor" means the person who in fact was the surveyor when the work was executed. But neither of these points is of much importance, because the plaintiff also relies on the oral certificate of Mr. Butcher given to the chairman of the defendant company and to the directors; and I find that this certificate was, in fact, given; and, in my opinion, it was the giving of this oral certificate which really led to the dismissal of Mr. Butcher from his post of surveyor. I also hold that the certificate required by the third clause of the contract is not a certificate in writing; and I find that the plaintiff did in fact complete the whole of the works to the satisfaction of the surveyor, and that such works were in a complete and satisfactory

state to his satisfaction at the end of the period of maintenance. Under these circumstances, I give judgment for the plaintiff for the amount claimed, with costs."

It appears that clause 2 of the contract provided :—"The works shall be completed in all respects and cleared of all implements and tackle, &c., within three months from date hereof to the satisfaction of the (said) surveyor, to be testified by a certificate under his hand." And clause 3 provided :—"The contractor shall receive payment for his contract at the rate of 80*l.* per centum for the works completed on the surveyor's certificate of completion, and the balance at the end of the term of maintenance, less deductions that may be made in accordance with the terms of the contract, and on the surveyor certifying that the whole of the works are in a complete and satisfactory state." The "maintenance" clause, contained in the specification, stated that "the contractor shall maintain the whole of the works in a complete state of repair for a period of three calendar months from the full completion of the works, to be testified by a certificate from the surveyor." It was contended at the trial by the defendants' counsel that no proper certificate had been given by the surveyor to satisfy the terms of the contract.

After the delivery of the judgment at Nottingham the defendants' counsel applied that the consideration of the case might be further reserved in order to enable the defendants to call certain witnesses, whose evidence had not been taken at the trial, to contradict the statement of the surveyor that he had given a verbal certificate of the satisfactory condition of the works to the secretary of the defendant company. The case was accordingly further adjourned to London, and that evidence was given, but the judge confirmed his prior judgment, saying that he saw no reason to alter it.

THE DUNDEE INSTITUTE.

A CONVERSAZIONE under the auspices of the Institute of Architecture, Science and Art took place last week. Mr. Charles Ower, the president, in opening the proceedings, said he had to affirm to the members, associates and friends the continued prosperity of their Institute. It was still advancing, the membership was increasing, and he was glad that the work it was doing was being more appreciated as its aims were becoming better known. While they were anxious to stand well with the public, they were not neglecting the professional side of their work. The library was flourishing. The prizes were well competed. The course of lectures was both interesting and instructive, and it was hoped that the electrical ones, which came next in order, would be of real practical value to the community. Mr. Ower proceeded to refer to the meetings, lectures, excursions and social gatherings of the Institute, and said these would be worse than wasted if they produced in the members no love for the beautiful and true, no feeling that they would like to do, or at least be the means of others doing, good artistic work. Artistic study without the desire to produce or promote art works was dead, and he desired to inculcate the theorem that the fine arts were in all and for all. He wished to take the fine arts in the widest sense, and he defined them as the arts which ministered to the sentiment of taste through the medium of the beautiful in form, colour, rhythm, or harmony—the arts, in fact, of architecture, sculpture, painting, poetry, and music. The office of these arts was to harmonise and refine, to purify enjoyment, and when duly appreciated to connect the perception of physical beauty with moral excellence, and it would be his object to show that in order to satisfy the wants of their higher nature it was necessary to know and feel something of those fine arts, which were merely different forms of expression of a certain feeling for the beautiful, which they might call the art sense; and just as they spoke of the senses of touch, taste, sight, hearing and smell, he maintained that there was another sense, the sense of the fitness of things and ideas. This he called the art sense. It would be found that all the expressions of this art sense produced in them similar sensations, and that the language they used in attempting to communicate to others what they felt when they were moved by any of the forms of expression of the art sense applied all through. He held that the person who did not have pleasure in the use of the art sense had something wanting in his nature, something which had been withheld from him, something which he had lost from disuse or from long continuance in degrading pursuits, and the loss of which made him a little less than man and yet not brute. The art sense was useless to the brutes that perish, and to the class of persons in whom it was wanting. But a developed body with an uncultivated mind was worse than useless, for "'tis the mind that makes the body rich;" and as the sun showed through the darkest cloud, so did the cultivated mind at last emerge triumphant. Everything that fed the mind contributed directly to their material prosperity. Cultivation of the art sense, like godliness, was profitable for many things, both in this life and that which was to come. To sum up, no man could be said to be happy in the highest sense without mental culture. The study of the fine arts was now a necessity for mental culture, therefore no man could be happy in the best sense without knowing something of the fine arts and cultivating the art sense. They desired to be happy, therefore they studied the great means to that end. For that the Institute was made and for that they were there.

THE CHURCHES OF SHREWSBURY.*

IT has, I believe, been customary in the last few years that the member of this society who is appointed by his Fellows to preside at the annual meeting should address those present on the objects of the society generally or should read a paper of some matter of interest, whether in archæology or natural history. It is a good custom, but, as time passes on, and our field of inquiry becomes narrowed, the chairman of the day will find an increasing difficulty in presenting new matter of interest and in treading on untrodden ground. The matter I suggest to you to-day is one in which in right of my office I may be supposed to feel an interest. That office has to deal with the existing buildings and estates of the Church, and thus, in the small acquaintance I possess with the study of archæology, I naturally turn first to the ecclesiastical buildings and estates of ancient times. But this is a very wide field, so I limit myself to-day to some inquiry into the old foundations of churches in Shrewsbury, and particularly the parish churches which still survive. How did they arise? and in what order were they founded? In dealing with these questions, I am well aware that I shall have very little of direct or documentary evidence on which I may rely or lay in evidence before you. I must proceed almost wholly by circumstantial evidence or even mere conjecture. The conclusions I shall venture to express will be matter of inference rather than history, submitted not for your information but for your criticism. They will be open to all sorts of objection, and will provoke discussion. I expect this, and what is more, I desire it. If my conjectures succeed in provoking discussion, the discussion will provoke inquiry, and inquiry will lead us some way, even in the dark, towards the truth.

Which, then, is the church of oldest foundation in Shrewsbury? If the answer when given be not very profitable, yet the inquiry is very interesting to some of us. For I remember, on occasion of Bishop Selwyn's first visit as diocesan to Shrewsbury, he asked (with reference to some action he was about to take), Which is your mother church? He was thinking doubtless of other places far larger now than Shrewsbury, which have grown up since the Norman Conquest from mere villages into populous towns and cities, yet recognising the one mother church which at Domesday sufficed for their inhabitants. He forgot that Shrewsbury was of provincial importance in Anglo-Saxon days, and certainly had more churches than one before the system of parishes was completely organised. Bishop Selwyn had for the moment innocently supposed that St. Mary's was the mother church, and was much amused to find that of the clergy present (it was happily only a clerical meeting) three other claimants came eagerly to the front. Of course, being a practical man, he dropped the question with a smile. But we, in so far as we are archæologists, do not limit ourselves to what are called practical questions, and hold that many things are indirectly useful which are of no immediate utility. So I ask the question once more :—Which is the church, of those now existing, which is of oldest foundation in Shrewsbury? There are now ten churches with ecclesiastical parishes assigned to them. In pursuit of an answer to my inquiry, I will deal with them by a process of exhaustion :—

1. We may set aside All Saints Church at once. It was founded in 1871, and does not even represent, as some of the other suburban churches do, any earlier dedication of a church swept away in the sixteenth century. And I may add, by the way, that we rarely find in places where at Domesday several churches existed, any one of them was thus dedicated. The title of All Saints was used chiefly where only one altar was set up, and the honour and interest of the whole roll of the saints was sought.

2. We may next clear out of the way the church of Holy Trinity, founded in 1836. But in this case the dedication does revive that of several altars in the old churches and chapels of the town which were consecrated by this name.

3. St. George's next passes out of the reckoning, consecrated in 1832. Its title, however, revives that not of an altar merely, but of a non-parochial church or chapel with a hospital, or what we should now call almshouses, which stood once within St. George's parish, not far from the Welsh Bridge. This earlier foundation was only of Norman date.

* An address by the Ven. Archdeacon Lloyd, given at the annual meeting of the Shropshire Archæological Society.

4. For St. Giles Church, which I think stands next, there is more to be said. I can well remember when, half a century ago, it was reputed to be the most ancient church in Shrewsbury, and on one occasion, when several scholarly men were present, one of them settled the question by quoting Pennant as having said so. "Pennant's Tour" was a book of great authority in those days, and indeed is still a sound book when Pennant describes things as he saw them; but not when, like myself to-day, he goes on to draw conclusions. But, to do him justice, he does not say this of St. Giles Church. All he says is that when he came to Shrewsbury he was told so. However, we may conclude now that the claim for St. Giles of earliest foundation was an empty one. Not only is St. Giles not mentioned in Domesday (which would not be conclusive, for the roll of then existing churches is not quite complete in Domesday), but, more than that, I believe that St. Egidius or St. Giles, as a patron saint of English churches, only came over with the Conqueror, and that there is no instance of consecration by his name before quite the close of the eleventh century.

5. Next comes St. Michael's Church. I place this as having a better claim to antiquity even than St. Giles, because, though the present building was erected only in 1831, and I was myself present at its consecration, yet it is not only a revival by name of one of the old parish churches of Shrewsbury of at least Anglo-Saxon date, but the parochial area assigned to it corresponds in large measure with the parish attached to that earlier church. The church of St. Michael stood just within the gateway of the castle. Owen and Blakeway's "History of Shrewsbury" is of opinion that it must have been founded by Roger Montgomery when he rebuilt the castle. But when we consider that the garrison within the castle had also a chapel, still existing, in the main building, and that further provision was made in the chapel of St. Nicholas for the garrison outside, and more than this, when we remember the considerable size of the parish attached to this church outside the town, it seems at least probable that the church was of earlier foundation than the Norman castle, but came to be included within its walls when those walls embraced a larger area of fortification. The church of St. Michael seems to have gone much out of repair in the fourteenth century, and soon afterwards its parochial bounds were broken up by a large portion being assigned to St. Julian's Church, some part to Battlefield, some to St. Alkmond's, and some reverting to St. Mary, from whence Owen and Blakeway are of opinion the whole originally came.

6. We come now to the five old parochial churches, the only churches in use in Shrewsbury sixty years ago. Of these the most recent, in the date of its foundation, is that now known as Holy Cross, though originally dedicated to St. Peter. This church, when afterwards connected to the Abbey of SS. Peter and Paul, founded by Roger Montgomery, became the most dignified and wealthy, and excepting only the Cluniac monastery of Wenlock, the largest and most beautiful of all the ecclesiastical structures of Shropshire. But as a church and as a parish church the date of its foundation cannot be carried further back that the middle, perhaps, of the eleventh century. It lay altogether outside the town, and a distinct record of its foundation exists as having taken place by one Siward not long before the Conquest. It is also stated as being at that time the least noticeable and important of the churches in and about the town, while St. Mary's is named at the same time as the most considerable. The tradition that it was the most ancient probably arose from a mistranslation of a Latin account of the foundation of the abbey as having been laid "in a church which was *parochia civitatis*." This some wiseacre rendered the parish of the city, using the definite in place of the indefinite article, a parish of the town, *i.e.* one included within its liberties though extended to its walls. I may add that Owen and Blakeway, though they deal with the parish of Holy Cross first in their history, on account of the dignity of the abbey with which it became connected, are careful to state that it was the youngest of the five parishes of the town.

7. I hesitate not to turn next to the church of St. Alkmond. The date of its foundation must be between the death and canonisation of the Prince it commemorates, and its mention in Domesday. Very little is known about Alkmond, or why and when he became a saint. All that we know is that he was a Northumbrian Prince, and the last of his race, dying or being slain at the beginning of the ninth century. This church is said in the Leiger of Lilleshall Abbey to have been founded by Ethelfleda, Queen or Lady of the Mercians. This might have been the daughter of King Offa, who became wife of Kenwolf, King of Mercia, who died in 819. But this date seems to be too near to the death of Alkmond, and scarcely to allow time for him to become canonised. Or it might have been Ethelfleda, a daughter of King Alfred, who married Duke Elthelred and became ruler of Mercia after her husband's death. This was about 912, or the beginning of the tenth century. King Edgar afterwards, in the middle of this century, appointed to this church a dean and ten, or as Domesday says, twelve canons, and in the same book of Lilleshall is stated to have done so because he was descended from the same noble stock of Northumbrian kings as St. Alkmond. No less than eleven manors were attached to the college as recorded in Domesday. Two of these were soon lost, and the rest were alienated by Richard de Belmeis, in King Stephen's reign, in order to found Lilleshall Abbey. When complaint was made of the poverty in which the parochial cure was thus left on the suppression of the college, the wrong was rectified by the robbery from St. Mary's College of the tithes of Cotonhill, which remain to this day the main endowment of St. Alkmond's Vicarage. We cannot place, I think, the foundation of St. Alkmond's before 820, and more probably not till 920.

8. It is a little difficult to know where to turn next, but I turn to the church of St. Chad. It has for some years past been either asserted or taken for granted that St. Chad's was in some sense the "mother church of Shrewsbury." On two occasions during the last twenty-five years, when some improvements were being carried out in the church and subscriptions sought for their execution, the dignity of this church has been pleaded as being the "metropolitan church," and therefore having a special claim on its neighbours. In no true sense could the word "metropolitan" be applied. Shrewsbury ceased to be a metropolis since it was the capital of Powysland, that is, before St. Chad was born. And if by the term it was intended merely that St. Chad was the mother church of the town, I think it can be clearly shown that it cannot claim such antiquity. And first let me say that the claim is one only made in recent years, and has probably grown up from the fact that it had become fifty years ago the largest and the wealthiest parish; that nearly all the public offices of both town and county were within its limits; that the judges of assize ordinarily attended worship there before the opening of their commission; that the public occasions of worship by the Mayor and Corporation have since the Reform Act been observed there in nine cases out of ten, and that the incumbent of St. Chad's has therefore been the Mayor's chaplain; that the bishops and archdeacons held their visitation there; that the church is capable of holding the largest congregation; and, more than all these circumstances, an impression had prevailed among Salopians after the rebuilding of the church on its new and beautiful site at a great cost that the church was as beautiful in its architectural details, within and without, as it was remarkable for its form. If in the earlier part of this century people came to see Shrewsbury they went first to St. Chad's, and the sexton who had custody of its key held the most profitable office of its kind in Shrewsbury. Among the country people who come only occasionally to the town, I find that this superstition has not wholly died out. That St. Chad's has indeed been since its foundation one of the chief churches of Shrewsbury there can be no doubt, but that it cannot have been the mother church is clear for the following reasons:—St. Chad died in 672. This was about a century before Shrewsbury passed out of the hands of the Welsh princes into those of the Mercian, and we cannot place the foundation of St. Chad's Church earlier than about 780. Well, then, was Shrewsbury at that time a Christian town or not? There can be no doubt, I think, whatever that the town was Christian while the Welsh princes held it, and that the Mercian kings had become Christian before they entered it. There must, therefore, have been churches in it, of which St. Chad's could not have been one. I think that we may fairly maintain, in the new light shed on the British and Anglo-Saxon period, that Christianity, though stamped out by the Saxon invaders over a great part of the island after the close of the Roman occupation, yet never disappeared from Shrewsbury, nor indeed from the greater part of Shropshire. It is quite impossible for me to go fully into the proof of this assertion now, but I do not hesitate to make it. Then look beside at the site of St. Chad's old church. It is said to have been built where the Lys or palace of the Welsh prince stood, and so did not succeed any earlier church. It was moreover outside the town. I suppose that it is now an accepted statement that the old British town was bounded, after the manner of the Britons, by a wall of earth and stone and a ditch, and that these ran from the castle along the west side of the hill to the bottom of Pride Hill, then across to the top of the Wylecop, and then returned to the castle along the east edge of the hill; that the town ditch or bailey ran along High Street; that a pool existed south of it where now lies the market-place, and that no part of St. Chad's parish lay within the town.

What churches had the inhabitants in the British days? I suggest that there were at least three, of which two survive.

9. One of these was in all probability St. Julian's or St. Juliana. I conjecture this partly from its singular dedication. It is a very rare one in England, if indeed any other exists. It is not at all likely to have been introduced by the Anglo-Saxons, who rarely used other than scripture names. Nor if founded after St. Chad is it likely that the dean and canons of the larger and more powerful foundation would have suffered so large a portion of the town, so closely adjoining them, to be severed from their control. St. Juliana was an early saint of Asia Minor, at the very beginning of the fourth century, and though unlikely to have been chosen by the Anglo-Saxons, not

at all unlikely to have been respected by the Britons. We still find in Wales a great number of saints belonging to the list of martyrs in the far East and South, whose names were honoured in the dedication of churches from the earliest introduction of the faith into this island. And besides its dedication pointing, as I think, to British times, there is its position within the old town, and the probability that more than one church existed within it in the British days, and the absence, too, of any tradition as to its foundation, points to, or at least admits, an early period.

10. We have now but one church left, of the history of which, however, very little is known, but concerning which much may be gathered from the circumstances attaching to it—I mean St. Mary's. I think that I have proved with regard to eight of the ten churches that no one of them can possibly have been the earliest, unless we suppose that Christianity in Shrewsbury did not survive the departure of the Romans. St. Julian's, I have said, may possibly, nay probably, have belonged to the British Church, by reason both of its site and its dedication; but both by reason of its dedication and its site it must yield in priority of foundation to St. Mary's. While All Saints and St. Peter, and perhaps St. Andrew, are the commonest of all Anglo-Saxon dedications, St. Mary's is, beyond all doubt, the most common among the Britons. None came near it except St. Michael. Llanvair and Llanfihangel are, I suppose, the most frequent titles at this day in Wales, and Llanyelian is not likely to have been set up until after the title Llanvair had been appropriated. And I have already hinted that St. Michael in the Castle may have been of British nomination, too. By such conjecture we should have three churches founded in the old town before the Anglo-Saxon invasion and the extension of the Mercian kingdom to Offa's Dyke. And when you look at the position of St. Mary's Church, in the very centre of the earlier town, and when parishes came to be defined, occupying in its cure of souls more than half the town area, and with a burial-ground extending at one time from the centre line of Castle Street to the very doors of the houses now occupied by Mr. Rope and Miss Hawkins, that a peculiar jurisdiction had been assigned to it from the days of King Edgar, not extending, as a similar right once did at St. Julian's over its own parochial area only, and soon to be lost, but still existing and extending over six other churches, that, before the Reformation, assemblies of great and even national importance were held within its walls, as in the reigns of Henry III. and Edward I., that besides its own churchyard-cross, the central or high cross of the town stood at the corner of its churchyard, that there is good evidence to show that the very ancient parish of St. Michael in the Castle was formed out of lands once within the limits of St. Mary's—when you look, I say, to all these circumstances pointing in one direction, with nothing to set against them except that the origin of the church is lost in obscurity, a truth which points two ways, you are left, I think, in face of this conclusion, that of all the existing ecclesiastical foundations in Shrewsbury, the earliest must have been St. Mary's.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

THE NUREMBERG VIRGIN.

(*Concluded from page* 326.)

HAVING obtained this information, we went to the spot pointed out by Dr. Mayer, which was exactly such as is described in the chronicle. In face of the street called the Sieben Zeiler, and not far distant from a building called the Banner Haus (where the civic feasts were anciently given), stood one of the bastions in the town wall. It was what engineers call a full bastion, and the terre plein, instead of having an interior slope, was scarped off perpendicularly and revetted with stone. In this revetment was a small old-fashioned door. Through this we descended by a flight of about forty or fifty steps into the casements of the bastion. I found a sort of recess or chamber formed by the projection of one of the counterforts of the town hall. In this chamber there were joists and rafters and other indications of a planked floor having been formerly there, and, indeed, it is extremely probable that this spot was used as a sort of waiting-room to the vaults in which the Virgin stood, it being almost immediately opposite to the door of the passage which leads to them. Through this passage we entered the chamber where the Virgin received her prey. This chamber was perfectly dark; near the centre of the floor was a square hole, and on the sides of it were the remains of hinges, which showed that it had been formerly covered with a trap-door. In a line with this hole I remarked, on the opposite wall, four holes, the position of which made it evident that some important piece of machinery had once been fixed there. Immediately over the square hole in the floor was a reel fixed into the ceiling, such as might be used either for suspending a lamp or for letting persons down into the vault beneath. This I found to be of much greater size than the upper vault. Having no ladder or other means of descending, all I could do was to let down a strong light at the end of a string, by means of which I was enabled to see its interior. It was arched like the upper chamber, and on the ground of it lay beams and large pieces of wood, showing clearly that a construction of no ordinary dimensions had once existed there, and being such as might very naturally belong to such a machine as had been described to me by Kiefer and Dr. Mayer. The grave also which had been mentioned by the former was to be seen. The woodwork, and everything which lay on the floor of this place, was in a state of great decay, owing to a quantity of water which had accumulated on the floor; and, although no stream runs through it at present, it is not at all impossible but that there might have been one formerly, or that there might then have been a means of letting water flow through the vault for the purpose of washing away the blood or whatever else, without some such means of cleansing, would have created an intolerable putrescency. I ought not to omit to remark that a corner of the upper one of the vaults which I have been describing was occupied by one of those torture benches called fiddles, similar in every respect to the one seen in the subterranean chambers of the town hall.

Having inspected all that was to be seen, we returned homewards. I could not, however, help remarking that if the persons intended to suffer death or torture in this horrid apartment entered it in the same way as ourselves, their so doing would be hardly consistent with the intentions of those who had constructed it; for it was evidently not intended to be an appendage to any system of public justice, but must have been the slaughter-house of some tribunal which executed its decrees in secret. It therefore seemed as if the apartment in question must have been approached through the blocked-up doorway, which must have led thither from some prison or other building of importance; and from what I afterwards heard (from a person whose name I am not at liberty to mention, but whose education, means of information, and respectability would give credit to any testimony) I found that my conjecture was correct.

The person to whom I have last alluded pointed out to me the Banner-house, which I have already stated to be at no great distance from the entrance-door of the vaults which I had been examining. "This Banner-house," said he, "has cellars underneath it, and in one of them there is yet remaining a small door. On passing through it you find yourself in a narrow passage. Go on a few paces and you will find two or three steps; mount these, and you enter a small semicircular room, in which is yet to be seen a stone table with seats. Pass onwards through this chamber, and you will be obliged to descend steps similar to those by which you arrived at it, after which, on proceeding a short distance, you will arrive at a doorway, now walled up, but which formerly led through the casements of the old fortress to the chamber where the Virgin was deposited." Having thus established the fact of the Virgin's existence by hearsay evidence, and confirmed it by the testimony of two intelligent living witnesses, who corroborated each other, I was obliged to rest contented for the time with the progress of my researches, and to trust to chance for enabling me at a future moment to find out the machine itself. Before I left Nuremberg, however, I tried to find out whether there was any well-known instance of a person who had suffered by the Virgin. The reply I received was in the negative; and the absence of such instances was accounted for by the proceedings of the tribunal to which the Virgin belonged having been always secret. But I was told that there was in existence an old Nuremberg ballad, the subject of which was a runaway match between a patrician girl and a plebeian youth, who, as the song goes, was made to perish in the arms of the Virgin by the family of the wife, as an expiation for the offence he had committed in dishonouring it with his lowly alliance. As, however, I could not procure a copy of this ballad when I was on the spot, and as I have never been able to find or hear of it since, and more particularly as the time to which it relates was said to be previous to the fourteenth century, I am inclined to doubt its authenticity, for there is some reason to believe that the Virgin did not exist in Germany before the fifteenth century.

It was not until the year 1834 that I obtained any further information about the machine in question. At that time I made an excursion to Vienna, and passed through Salzburg. In the castle at the latter place I was shown a torture-chamber, where I was assured that a Virgin had formerly stood, and an Austrian sergeant who showed me over the place, an intelligent man, assured me that this engine was at that time deposited in the Imperial Arsenal at Vienna. The torture-chamber at Salzburg was situated in a small square tower. Like the vault at Nuremberg, it had a trap-door in its floor into a still larger chamber underneath, but this had evidently never had any machinery in it like the inferior vault at Nuremberg. Both chambers at Salzburg were sufficiently well lighted, and I am

much inclined to think that the undermost one was merely a room where culprits were obliged to wait until they were hauled up out of it to be examined in the upper one.

At Vienna I did not fail to make inquiries at the Imperial Arsenal concerning the Virgin which was said to have been deposited there, but the persons who had the custody of that building assured me that no such engine was in it, nor to their knowledge in Vienna. Many persons of the better class to whom I spoke on the subject denied that the Virgin had ever existed in Austria; but my *laquais de place* and others of the lower class told me that when they were young it was said to be standing in a tower which hangs over the canal that runs through Vienna into the Danube, and that whenever the water there looked a little red (as was usually the case after a storm) nothing was more common than to hear people say, "So the Virgin has been at her work again."

At length I learnt accidentally in conversation that a specimen of this terrible machine might be seen in a collection of antiquities belonging to a certain Baron Diedrich, and kept in a castle called Feistritz, which he had purchased on the borders of Steirmark, and which he very politely permitted me to visit. A predilection for the relics of past times and a very considerable fortune have given to the proprietor of this castle the disposition and means of assembling there a great quantity of ancient arms and armour, furniture, books and other things of an interesting character, but the history of his becoming possessed of the Virgin is particularly worthy of attention.

"I bought it," said he to me, "of a person who obtained it, with the left hand, during the French Revolution, and had with it great part of the contents of the arsenal of Nuremberg. From him I received it in a cart with several things which had formerly belonged to that arsenal. It came to me rusted and in bad condition, deprived of its machinery, but accompanied by the pedestal on which it now stands."

Now let the reader look at the figures, which represent accurately the Virgin in question, and he will see something very like the costume of Nuremberg in the sixteenth century, which is precisely the epoch when the Virgin is said to have been constructed there. Let him also understand that the Virgin represented by the drawing is just 7 feet high, Nuremberg measure, and is made entirely of iron, and then I think he will agree with me that the Virgin in the possession of M. de Diedrich must be the same machine which stood formerly in the subterranean vault of the before-mentioned city. When I saw it, it was placed on a sort of low wooden pedestal, hollow and square, which, as I have before said, accompanied the machine itself into the hands of its present possessor.

The construction of the figure was simple enough. A skeleton, formed of bars and hoops, was coated over with sheet-iron which was laid on and painted so as to represent a Nuremberg citizen's wife of the sixteenth century, in the mantle then generally worn by that class of persons. From the figure representing the interior of the machine the reader will see that the front of it opened like folding doors, the two halves of the front part of it being connected by hinges with the back part. On the inside of its right breast are thirteen quadrangular poniards. There are eight of these on the inside of the left breast, and two on the inside of the face. These last were clearly intended for the eyes of the victim, who must have therefore gone backwards into it, and have received, in an upright position in his breast and head, the blades to which he was exposed. That this machine had been formerly used cannot be doubted, because there are evident blood-stains yet visible on its breast and on the upper part of its pedestal. How it was worked is not known, for the mechanism which caused it to open and shut is no longer attached to it, but that there was some such mechanism is clear from the holes and sockets which have been cut out on the surface of the pedestal, showing the points where parts of the apparatus intended to work it must have been inserted. It stands at present on castors, and there are two iron springs which its present proprietor has caused to be placed in it, for the purpose of making its sides to open whenever it is moved forward, but this is merely done to startle, by way of pleasantry, those who see it for the first time, and without any idea of explaining the means by which it was anciently made to perform its office.

Perhaps, however, I can throw some little light on this difficulty. In the year 1835 I met at Liège with a very well-educated and accomplished man of letters. He was a Frenchman by birth, and had been attached to the Court of Joseph Bonaparte, when he was promoted by his brother Napoleon to be King of Spain. There my informant told me that he had an opportunity of inspecting the chamber of the Inquisition at Madrid, and that among other instruments with which it was provided he found an image of the Virgin Mary, composed partly of wood and partly of iron. This engine was called "Mater Dolorosa," and with it was administered the last and severest degree of torture. Its ordinary position was that of a woman standing erect, with her arms crossed on her bosom, but there was a contrivance by which she was made to expand her arms, and then the inside surfaces of them were seen to be garnished with a number of small points or stilettes. The person to be tortured was placed opposite to her, breast to breast, and then her arms were brought round his back, and by means of a powerful screwing implement made to grasp him tightly, so as to inflict great pain and to render it impossible that he could fall from her gripe. Whilst she held him thus firmly a trap-door was opened under his feet, so as to cause him to hang in agony over an abyss. In this position he was importuned to confess his guilt, whilst the arms of the machine were slowly and gradually screwed tighter and tighter till life was squeezed out of his body. His corpse was then released, and fell through the trap-door into a sort of *oubliette*. Now I am much inclined to think that the machine in the possession of Baron Diedrich was made to do its inhuman duty somewhat in the same manner as the machine in the Spanish Inquisition—that is to say, its front was probably forced down on the person within by means of some screwing apparatus which is now lost.

Perhaps also the merit of having invented the Virgin is due to the genius of Spain, and it is by no means improbable that it was from thence transplanted into Germany during the reign of Charles V., who was monarch of both countries. According to M. de Pfeffel ("Abrégé de l'Histoire d'Allemagne," p. 414), there were great tumults in Germany during the years 1531 and 1532, and continual quarrels at Nuremberg between the Protestants and Catholics. "In 1532 was published," says he, "the famous Criminal Code of the Empire, which was the most severe and the least observed in Europe." In 1533 (only one year later) the Iron Virgin was, according to the chronicle cited by Siebenkees, constructed at Nuremberg. This latter fact is sufficiently remarkable, for one may see that, not content with having made a penal law more cruel than the spirit of the German people, the Imperial Government of that day quietly permitted the institution of a punishment not authorised by that law, and too remarkable to escape attention. How is this fact to be explained? One is almost tempted to believe that some member of the Supreme Council of Castile had thus addressed himself to the German ministry of his sovereign, "Gentlemen, you have done your work awkwardly: you have attempted to do in public more than your people are prepared to welcome. You may, however, repair your error. Do in secret that which you may find it inconvenient to do openly; and if you wish to know how, go to Venice or come to us, and you will see that, in our secret tribunals, we get on with our business very well, without being subjected to the inconvenience of shocking public sensibility."

As I have not the means of consulting those books and authorities which might fix the time when this machine was first employed in Spain, I cannot do more than offer, as a bare supposition, my idea that it was received from them into Germany; but I was told by Mr. Gèvay, a learned and distinguished Hungarian in the Imperial Library at Vienna, that he had read of this machine in a Spanish romance of the early part of the sixteenth century, which proves that it was known in Spain at the period in question. The author also of a French romance, published at Paris in 1828, and entitled "Cornelia Boroquia," makes mention of it as Spanish, and this attributes it to the same epoch, for she was tortured, if I remember rightly, in the sixteenth century. Add to this, that it is an instrument much more congenial with the genius of the Spanish nation than with that of the Germans. The latter are not naturally cruel, although they may be sufficiently prone to imitate bad example; and if one examines the German instruments of torture of the sixteenth century he will find them extremely rude and simple, whilst those of Spain are not only better wrought, but have an elegance of form and an ingenuity in their contrivance, which could only come from the hands of persons who could follow and study this kind of manufacture with zeal and pleasure, and be ambitious of the peculiar distinction which a successful cultivation of it might produce.*

* See *Architect*, November 20, p. 325.

* The following extract from Hampton's *Polybius* seems to attribute the invention of the Virgin to Nabis, tyrant of Sparta, who died B.C. 192:—"He (Nabis) contrived also a machine, if it may be called by such a name, an image of a woman, magnificently dressed, and formed in a most exact resemblance of his wife. And when his intention was to draw money from any of the citizens, he invited them to his house, and represented to them the great cost of maintaining the worship of the gods, &c. If these arguments prevailed, it was sufficient for his purpose. But if all his solicitations were without effect, then he used to say, 'I want, it seems, the power of persuasion; but Apega, I believe, will persuade you.' Apega was the name of his wife. Upon these words an image of the woman that has been mentioned immediately appeared. Nabis then taking her by the hand raised her from her seat, and folding afterwards his arms round the person whom he had been soliciting, brought him near by degrees to the body of the image, whose breast, arms and hands were stuck full of points of iron, concealed under the clothes; and then pressing the back of the pretended woman with his hands, by means of some secret spring, he fixed the man close to her breast, and soon forced him to promise all he desired. But there were some also who perished in this torture, when they refused to comply with his demands." Vide vol. ii. ed. Lond. 1772, p. 291.

There can be no doubt that many of these engines were formerly to be found in Germany, especially in corporate cities and in the castles of wealthy and powerful princes, and there can be as little doubt that shame, at the idea of having the reputation of even countenancing a thing so barbarous, has induced, in almost every instance, the posterity of their original possessors to hide or destroy or sell them for old iron, so that one may regard the machine now in the possession of Baron Diedrich as a very great rarity. I have, within the last year, been told of the existence of at least half a dozen; but on making inquiries at the places where they were reported to be present, I have invariably received answers in the negative. I remember that an old Austrian artillery man, who, in 1834, was living at the castle of Baron Diedrich, told me that, when he was a young man and garrisoned at Prague (which was fifty-seven years anterior to the time of our conversation), there was a machine of this kind at the Wenzels-Burg, near that city, and that it stood on the first floor of that building, in a long room, which was then used by the Austrian artillery as a laboratory. This man was nearly eighty years old, but was in full possession of his intellect, and he told his story so simply and naturally that I could have no doubt of its correctness. He said that the machine was made differently to that in the castle, for that it had arms, and that the soldiers used to amuse themselves by making them open and shut, until one day they broke the machinery and so crippled it. He described particularly the place where it stood, and said that he and his comrades and everybody else regarded it as a useless piece of old iron. He added that he himself had never seen any others than the Virgin at Prague and that belonging to his master, but that in his youth he had heard of many, which he could not particularise, because at that time it was generally believed that they existed in every town where the corporation possessed a criminal jurisdiction, although they were regarded as relics of antiquity which had long ceased to be employed.

There can be no doubt, however, that this machine no longer exists at Prague. I was there in November 1834 and took much pains to find it out, but in vain. The keeper of the council-house told me that, some years ago, he had in his possession the instruments of torture and execution which formerly were used by the magistracy, and that there was no such machine as the Virgin amongst them. He said, however, that such an engine was reported to have anciently existed in the white tower on the Headchin, where State criminals were formerly executed in secret. But this tower was in ruins, so there was no chance of finding it there, although I understood from a person who descended into the pit of it that, from the number of human bones to be found there, one might fairly conclude that the office of executioner was no sinecure in former times.

I have since heard, on the evidence of a most respectable eye-witness that, some years ago, there was a Virgin in the castle of Ambrass, near Insbruck, which was furnished with arms like that at Prague. I have heard, also on very respectable testimony, that another similar to the former was, some years since, in the royal castle at Berlin; but I have not been able to ascertain whether it now exists there. Another is said to be standing in a perfect state in the castle of Schwerin; but in this case I cannot rely on my authority as in the others. Probably one might find in Spain other specimens of this machine; perhaps some may exist in Italy, for I have heard that at the close of the war of 1814 there was something very like it at Florence. But in Germany the country has been from time to time so pillaged and overturned by war that it is more than difficult at the present day to lay one's hand on an example, the more especially as the municipal governments there like better to conceal than to avow the existence of such a machine.

But, after having seen the engine in the possession of Baron Diedrich, one can no longer doubt that others of its species were employed as appendages to the ancient tribunals, and one is therefore obliged to regard the story of "The Kiss of the Virgin" not as a popular legend but as history. It is for the purpose of putting this fact in evidence that I have written the present narration. In the course of another hundred years all substantial traces of the machine will probably have disappeared, and then there will be no want of persons ready to treat as false a tradition which, nevertheless, throws a sufficiently strong light on the judicial institutions of the past time.

I cannot close these observations without remarking what appears to me to be a very singular circumstance, namely, that although the word "Jungfernkuss" is familiar to every peasant in Germany, one can neither find it in the lexicons of Adelung and Campe, nor in any other book of that sort which I have been able to consult. One is almost tempted to believe that explanation of the word was forbidden by the censors of the press. Be that as it may, there can be no doubt that the machine was employed in many of the European states, and in most, if not in all, of the Imperial cities, and perhaps its existence is the strongest proof that can be adduced of the danger of permitting tribunals of criminal justice to do their duty in any other place than an open court.

CHURCH BUILDING AND RESTORATION.

Wigan.—The fine church of St. John, built about the year 1820, has been embellished by the erection of new altar-rails of marble and alabaster, and the sanctuary has also been enlarged. The work was placed in the hands of Mr. C. Hadfield, architect, of Sheffield, from whose designs the whole has been carried out by Messrs. J. & H. Patteson, sculptors and marble merchants, of Manchester, and Mr. Preston, contractor, of Wigan. The rails are of bold design and follow the architectural lines of the chief features of the church, being straight in front but curved at the sides, and upwards of 52 feet in length. The balustraded portion is composed of light-coloured alabaster of the finest quality relieved by panels of Seravezza marble. The base and broad capping of the balustrade are formed of richly-tinted and veined rouge griotte, while the step and riser on which they stand is dove marble. The flooring and new arrangement of steps which the rails enclose is laid with pitch-pine boards in patterns, wax polished and partially carpeted.

GENERAL.

Mr. W. H. Hunt's picture, *The Triumph of the Innocents*, which has been purchased by the Liverpool Corporation, has now been placed in the permanent collection.

The Berlin Correspondent of the *Standard* announces that Herr Gustav Spangenberg, the painter, whose most famous picture, *The Procession of Death*, is in the Berlin National Gallery, has fallen a victim to the influenza, after an illness of only three days.

The Institute of Painters in Oil-colours have elected Messrs. Edgar Bundy, R.I., Carlton A. Smith, R.I., William Rainey, R.I., St. George Hare, Leslie Thomson and Anderson Hague, R.I., as members.

Ribera's "Descent from the Cross" has been restored to the city of Dijon, from which it was taken to enrich the collection of the École des Beaux-Arts, Paris.

Rev. C. W. Grove has undertaken to place a series of five stained-glass windows in the north aisle of Tewkesbury Abbey, in character with those he has previously placed in the south aisle.

Mr. Charles Dyall has been elected president of the Liverpool Artists' Club, in succession to Mr. P. H. Rathbone.

A Pastoral Staff, designed by Sir A. W. Blomfield, has been presented to the Bishop of London.

Colonel Harding has been appointed chairman of the Leeds Corporation Fine Art Gallery Committee.

Mr. Mortimer, of the firm of Karslake & Mortimer, architects, Westminster, died suddenly while measuring works in Dublin on Monday last.

Messrs. Bruton & Williams, of Cardiff, have been successful in the competition for the cemetery chapel for the Barry and Cadoxton Burial Board.

The Comte de Figueiredo has presented the Fine Arts Academy of Rio Janeiro with a fine collection of modern paintings which are mainly by French artists.

Mr. A. P. Laurie, M.A., will on Monday next deliver his first Cantor Lecture at the Society of Arts, on "The Pigments and Vehicles of the Old Masters."

The Design of Mr. John Jackson, architect, Barry Street, Westgate, Bradford, has been accepted in public competition for the new Baptist Chapel at Heaton.

Dean Argles has offered 500*l.* towards the removal of the organ to the triforium in Peterborough Cathedral and the purchase of a small organ for use during the reconstruction of the great organ. Stalls for the choir have been accepted from the Freemasons of England, the Corporation of Peterborough and Mr. Gates, the chapter-clerk.

Convocation at Oxford has voted a second sum of 25*l.* towards the cost of the antiquarian excavations at Chester, which, as the Provost of Queen's observed, were throwing great light upon the obscure period of the military occupation of Britain in the time of Agricola, and were a matter of great interest to Professor Mommsen.

Crowland Abbey Restoration Works, suspended some time ago for want of funds, are again in active progress. Two of the arches which carry the steeple were in a most dangerous condition; but these are now being made safe, and the bell-chamber, it is hoped, will be sufficiently strengthened as to admit of the fine old peal of bells being rung again at Christmas.

An Inquiry has been held at Buxton as to the application of the Local Board for sanction to borrow 3,283*l.* for works of sewerage, street improvements, surface drainage and water supply, 1,200*l.* for works of gas supply, 485*l.* for public walks and pleasure grounds, 432*l.* for road rollers and water vans, and 350*l.* for construction of a bridge. No objections to the proposed works were submitted.

The Architect.

THE WEEK.

IT takes a long time for English ideas to go through that process in American brains which ends in action. One example may be cited. The Committee of the American Institute of Architects have decided to print all papers that are to be read at an annual convention, and circulate them among the members in order to facilitate discussion. This is supposed to be a happy thought, which has gained much credit for the Committee on account of its utility and novelty. For our part we are glad to hear of the arrangement, for it originated in the course of some advice we proffered to the American Institute nearly five years ago. In an article published in *The Architect* on January 7, 1887, about one of the conventions, it was said, "Papers are essays, and if they contain information it is more likely to be rendered profitable if the student can read them at leisure. If the subjects are of pressing interest it is unwise to have the papers suddenly sprung upon a meeting. They should be distributed beforehand in order that members might be in a position to discuss them. It is not everybody who is a ready speaker, and in consequence the discussions of papers in most societies is generally left to a few members and ceases to have much sincerity." It would have been wiser for the Institute to adopt our plan much earlier, but in that case the Committee could not so easily gain a reputation for originality.

THE contest for the seat in the Académie des Beaux-Arts rendered vacant by the death of ELIE DELAUNAY did not last long, for at the first turn M. JULES LEFEBVRE secured twenty-four votes from the thirty-five members who were present. The other candidates were MM. JOSEPH BLANC, EDOUARD DETAILLE, LUC-OLIVIER MERSON and AIMÉ MOROT. M. LEFEBVRE is one of the successful figure-painters of Paris. His works are admired in other places, for his *Diana* was purchased by a Glasgow merchant, who paid 1,500*l.* to secure it. M. LEFEBVRE comes from Amiens—the city allowed him 40*l.* a year—and was one of the numerous pupils of COGNIET. After a fourth trial he gained the Prix de Rome. Few holders of the prize worked harder. Among the works he produced was a copy of ANDREA DEL SARTO'S *Last Supper* in the refectory of the convent of St. Salvi, Florence, the one work which can be mentioned with DA VINCI'S masterpiece. Since his return to Paris M. LEFEBVRE has gained admiration by his paintings of the nude figure and his portraits. He is head of one of the great ateliers of Paris, where he endeavours to develop the individuality of his students in preference to making them imitators of his own style.

COVENTRY stands in need of a second Lady GODIVA, who, like her predecessor of a thousand winters back, can undergo and overcome, thus building for herself an everlasting name. This time it is not a grim earl, "his beard a foot before him, and his hair a yard behind," who is to be prevailed with, but prosperous landlords and successful manufacturers. The old part of the town is still picturesque, and it is a pleasure to ramble through the streets and lanes, although everything exposed for sale in the ancient shops is terribly modern. But picturesqueness and sanitation do not always go together, and the local medical officer of health, regarding the town from the official point of view, is compelled to draw a picture of Coventry which contrasts strangely with those of painters and photographers. In his last report he says:—"Coventry, like many towns similarly built, contains a large number of dwellings which are so constructed as to prohibit the possibility to the inhabitants of them of living healthy lives. A house cannot be wholesome unless the two great vitalising elements, light and air, are admitted into it, and in Coventry there are no less than 3,106 houses, where this cannot be satisfactorily accomplished, owing to the manner in which the houses are crowded together, the lowness of the ceilings, to the small size of the doors and windows, which are situated on one side of the house only, and also to the fact that many houses are so subdivided internally, in order to increase the sleeping accommodation, that some rooms have neither windows, fireplaces or other mode of ventilation, and at night are like closed boxes." There is no exaggeration in the description which is applicable to many other towns that on the outside are fascinating to all who are wearied with modern structures, which, if well drained and ventilated, are deficient in the witchery of light and shade. What is to be done with houses like those of Coventry is difficult to discover. There can be no doubt that they help to keep the death-rate high. The rents, however, are low, and the inhabitants poor. The manufacture of cycles has created a new Coventry, which a sanitarian would consider to be satisfactory; but the surviving representatives of the trades which have fled to other towns cannot become tenants of bright red-brick houses. When one tenant of the antiquated domiciles passes away, there are unfortunates who are willing to take his place, although the "house" may have no back door or back window. The inhabitants of the new streets do not care to pay for remedying the faults of the old builders; the owners of property will not introduce improvements for which they will receive no return. The case is complicated, and, as we have said, a Lady GODIVA is needed.

IT is to be hoped that the speech delivered this week at Douglas by the Bishop of SODOR and MAN is a forerunner of episcopal co-operation with all who desire to see English churches fitly adorned. His lordship said that there was an illusion abroad that the Church and art, if not antagonistic, were at best mutually indifferent. It would be sad and strange if this were true. The Bishop asked whether one of the characteristics of the human race was not that everywhere pleasure was taken in combinations of form, of colour and of sound, a pleasure which became extended as their perceptions became enlarged? Would it not be strange if religion, which sought to touch men at all points, should have nothing to say in regard to this universal instinct? The true artist was no mere painter to accumulate facts upon canvas or to reproduce in colour what all men could see for themselves. He had to gain the ideal of his subject, and then to present it in an intelligent shape. He had to give the right effect, and then to call out the right feeling. Would it not be sad indeed if for such art the Church had no words of sympathy? He was bold to say that if art had love for its motive, truth for its object, and the discovery of truth in its aspect of beauty for its aim, then such art became not only a handmaiden to the Church, but an ally and an associate. To turn from the ideal to actual history of the past—Was not modern music a creation of the Church? Had not architecture in all its exquisite forms been developed to supply her needs, and had not the gospels and other illuminated works of devotion found their crowning glory in the art of MEMLING and VAN EYCK? Perfect art tended to destroy superstition. He claimed for the Church that in the past she more than all other agencies combined popularised art. But as SHAKESPEARE says, what is done in the present, though less, must o'ertop what was done in the past. There is no denying that art was at one time enabled to offer gifts which were accepted, but when it is found that churches can only be decorated with painting and sculpture in fear and trembling, on account of apprehensions of episcopal opposition, how can the English Church be taken as loving art?

THE *Architectural Review*, of which the first number has appeared, is an interesting and welcome addition to the technical literature of America. It is contended by the promoters "that the art of architecture [should deal primarily with conditions, not with precedents; that those conditions are physical, and should appeal to the eye more than to the memory, and that architecture should be organic and logical before it should be reminiscent; that it is an intellectual more than an emotional art, and finally, being distinctly artificial, and acknowledgely so from the first, it is more than absurd to mask it with realism." The upholding of the principles will afford opportunities for clever writing. One of the features of the first number is an elaborate description, with drawings, of Wenlock Priory, by Mr. H. LANGFORD WARREN. The *Review* is to be published eight times a year. The first number is creditable to all who have taken part in its production.

ARCHITECTURE AND SCULPTURE.

THE ancient philosopher who declared that the triangle was the symbol of beauty because it exemplified multeity in unity, might have taken his ideas from one of the buildings in Alexandria. There he must have seen architecture, sculpture and painting combined to produce a whole that was believed to be perfect. To his mind the absence of one of the arts would be the severance of a quality by which beauty vanished, harmony became discord, and reason lost its power. In buildings, as in other productions, the Greeks delighted in the skill by which different forces were controlled and made to serve one end. Their great epic has more variety than the volumes of a modern miscellany; there is even room in it for a THERSITES. Their best thinkers were charged with plagiarism, and with some reason, for they tried to be encyclopædic. When the temple became an institution in which the citizens were concerned, all arts were made to contribute to its magnificence, but subjected to that instinct for proportion and measure with which the Greeks beyond all men were endowed.

To what extent painting was utilised can only be imagined. The colours used by Greek artists were probably few, but for decorative purposes painting could be supplemented by embroidered stuffs. It is unnecessary to say that sculpture was used, not as an adornment that was extraneous, but as if it were indispensable to have a large part of the masonry wrought into figures. Single figures like those now scattered throughout the world were also likely to be used, at least in Greece, to give effect to the buildings containing them.

With the Romans there was, no doubt, more license in using the arts. Some of the buildings were overcrowded with sculpture, but what could be expected when so many works were brought to the city as spoils? The paintings on the walls, which were as bright as gold and vermilion could make them, must have been painful to the eyes of Greek visitors. But what is clear is, that the Romans, who were not destined by nature to be artists, yet possessed sufficient masculine sense to perceive that their buildings would be more pleasing if painters and sculptors co-operated with architects in completing them. It certainly is remarkable, as an indication of Roman desires, to find the people who were driven into the catacombs, many of them being humble folks, and who were convinced that their lives were most precarious, lost no time in adorning their place of refuge. The very simplicity of the figures, which seem to be the work of amateurs, who could only adapt pagan forms, suggests the prevalence of a belief that the walls of every important chamber were incomplete if they did not display some sort of ornamentation. As evidence of the tendency of the time, the catacombs are no less useful than the retreats of Pompeii, where little but artists' work is to be seen.

In the Byzantine period the painters' work did not fall out of favour with patrons of architecture. Mosaic was only a development of it, used to gain more effect. The old traditions about the necessity of sculpture were respected, and it is related that no less than four hundred and seventy statues were set up at one time in St. Sophia. Need it be said that during the Mediæval times architecture, painting, and sculpture seemed to be different species of one art, rather than three independent arts?

Some apology is needed for inflicting the foregoing scanty review on the reader. It has been given in order to show if possible with more clearness when the change took place. For all who have cared about the history of art must be aware that the old traditions do not support a belief in the superiority of architecture which depends for effect on the work of the mason, without other adornment. That noble buildings can be constructed without aid from subsidiary arts, must be admitted, and cases arise in which a severe treatment is desirable; but the majority of buildings would be better for that aid.

It is not easy to discover how the neglect of painting and sculpture could have originated. During one part of the Renaissance the buildings were designed by painters and sculptors. It might be supposed they would turn their own work to account, but there were causes at work against them. The painters, when they found that, under new conditions of control, it was not necessary to paint on the walls of a church, and that a picture in oils was more acceptable, naturally devoted themselves to the latter class of work. It was easier, and far more satisfactory, to paint in one's own workshop than to toil at frescoes under the criticism of priests or monks, and at their dictation. The stories which are related about the disagreeable encounters between the Pope and MICHEL ANGELO about the Sistine Chapel, between the Dominican prior and DA VINCI, to say nothing of the more legendary treatment of CORREGGIO by the canons of Parma, reveal a change in the relations between painters and one important class of patrons. Fresco pictures were more and more neglected, and in course of time wall-painting may be said to have become one of the lost arts.

There was another reason for the change. The ancient buildings of Rome no longer exhibited the colour in marble, mosaic and painting which at one time characterised them. In consequence, people easily assumed that plain stone in its natural colour was the proper material for a building. So strong was the belief, that many people in RAPHAEL'S time were sceptical about his discovery of fragments from the Baths of Titus which were covered with arabesques. It was supposed that the ancient Romans could not have tolerated so frivolous a treatment of the walls of a public building. This becomes more evident when it is found that the decoration which RAPHAEL and his assistants derived from the fragments, and employed in the loggie of the Vatican, did not find much favour in Rome.

Architectural sculpture in its history during the Renaissance in Italy bore some resemblance to the history of wall-painting. Even when he produced single figures in his own *bottega* a sculptor was at one time willing to sink his own personality out of a desire for fair play to the men who co-operated in other ways in erecting or decorating the building in which his work was placed. DONATELLO did not put his name on his statues of *St. Mark*, *St. Peter* and *St. George*. It was the applause gained by the figures which induced him to sign his *Judith* which was for the senate house. The question which he addressed to one figure, *Marco, perchè non mi parli?* suggests that he regarded it as not entirely his own. The setting up of single figures in public places made sculptors indifferent to all people but themselves, and, with independent commissions, they could hardly be expected to pine for days when they were as units in a crowd. The old ways are suggested by the eagerness of DONATELLO to depart from Padua, where he heard nothing but praises. He feared he would become enervated. But DONATELLO was almost the last of the school. The new race accepted praise as a tribute, and it would be risky for any architect to offer suggestions about one of their works. There are writers who hold that Paganism—that is, naturalism—was fatal to painting in Italy. With more reason it might be said to have put an end to architectural sculpture, for the delight in figures of mythological personages created patronage, and sculptors were drawn away by it from buildings.

The best representative of the architectural sculptors in the sixteenth century was not to be found in Italy but in France, in the person of JEAN GOUJON. Like some of the Italians, he was also an architect, and the Hôtel Carnavalet, which served as a residence for Madame DE SÉVIGNÉ, was, it is said, designed by him. GERMAIN PILON was another sculptor who was a master of decoration.

It is not necessary, however, to follow out the history of sculpture in either France or Italy. The artists who were most fortunate in gaining the favour of the public did not care about employment on buildings, but they helped to create a crowd of men who were not unwilling to execute architectural sculpture. In France the influence of the sculptor's art is to be traced in the humblest classes of decoration, and to it, rather than to painting, the country is indebted for its success in the markets of the world. As was said by Mr. WESTMACOTT, R.A., "the mere fact of the extensive employment of sculpture wherever it can be introduced proves that it is almost a requirement in France, and it is inconceivable that an observant and acute population that has con tantly before it works of art should not be improved by such association." Whatever kind of sculptural decoration may be required by a French architect he can readily find men to undertake it, and his

client is not unwilling to pay for the work as if it were a necessity. Nor is France the only country where the art is in request. In Austria there seems to be a larger demand for architectural sculpture than in France. As for Germany, it may be said that if the figures were removed from many of the new buildings little would be left to attract the eye. The sculpture compensates for the rigidity of the architectural lines—for, from the cast-iron accuracy of all parts of the masonry, it might be supposed that it came from a foundry; so that what SCHILLER says is applicable in a sense he did not anticipate, for the stone might have been melted—"der Marmor schmelzen unter Hammerschlägen." It is not necessary to inquire whether all the architectural sculpture that is visible on the Continent is according to the highest canons of art. The sculptors very often, like their Italian predecessors, are indifferent to general effect, and make their figures too obtrusive. But if architects cannot exercise adequate control over all who aid them they are not fit to exercise their office.

In England, so strong is prejudice, it is difficult to make people understand that sculpture is useful for any purpose except the production of portrait busts and statues that will increase the dismalness of public places in towns. The prohibition of graven images among the old Hebrews still makes good people cautious about sculpture, however innocent. The art fell into disuse when the occupation of the men who worked for churches came to an end under HENRY VIII. It might be supposed that the coming of a great artist like TORREGIANO would bring about a revival of interest in sculpture. For a very brief period his influence was beneficial, but the apprehension of spiritual danger was too strong to make people take delight in figures. The art was again neglected. Whenever sculpture became a necessity—as for monuments or for buildings—the work of native masons was accepted, unless in exceptional cases, when orders were sent over to the Low Countries. The ignorance on the subject is revealed by the writings of Sir HENRY WOTTON. He was desirous to exhibit some of his connoisseurship to CHARLES I.; but while he waxes eloquent over the pictures, he was unable to say anything definite about the statues. The great NEWTON could not understand what men saw to admire in "stone dolls." Many years in consequence passed away before an Englishman appeared who was willing to study the art until he deserved to rank among the sculptors of France and Italy.

When at last sculpture was recognised in England as "a very serious business," for so REYNOLDS described it, there was a belief that to work on buildings was unworthy of any one who could produce figures of gods and goddesses. Architectural sculpture was relegated mainly to foreigners. It was taken for granted that an inferior class of work would serve in buildings, and of course the prices paid were not much beyond the wages of stonecutters. The belief has not entirely passed away. The statuary of the Houses of Parliament was produced at the cheapest rates, and there are people connected with prominent buildings who appear to think that a sort of tombstone carving would be adequate. Too many examples of such imperfect work are visible in the metropolis.

At the present time the worst obstacle to the introduction of sculpture is still that of cost. Architects would often be glad to avail themselves of so efficient a means to increase the interest of their buildings if the financial difficulties could be got over satisfactorily. The majority of English people, when they buy a work of art, at once begin to think about the sum it would reach if put up in an auction-room. Sculpture does not, as a rule, appeal to purchasers in such a place, and in consequence there are often sacrifices. But a piece of sculpture fixed on a building cannot be removed, and it has hence not much market value. We may regret that people who build have not more appreciation of the art, but who is to educate them or convince them of their error? We must take the world as it is, and at the present time an architect who insisted on sculpture in a building would be likely to discover that he was risking the loss of a client. There are, no doubt, many sculptors who are prepared to exercise much self-denial in order to reconquer a province that once belonged to their craft, but the public will not be tempted, and until there is a change in opinion it is impossible to see how architectural sculpture can be advanced.

AN ARCHITECT'S VERSES.*

IT is rather unusual for an architect to express his thoughts in rhyme or other metrical arrangement, and in all the preceding volumes of this journal there is no account of an experiment of the kind. Those who cannot resist the impulse (which is natural to all men) and must use burning words, no matter whether they unite in songs or sermons, and the still larger number who, like Mr. WEGG, in a more subdued yet friendly way, drop into poetry, alike keep the inspired results from all but their most trusted friends. It may be through a fear of the consequences, for as the song says, "Dichter sind Schmeichler," and nobody wishes to be bamboozled into giving commissions. Practical people may also imagine that an architect cannot write sonnets and specifications with equal attention; contractors, too, would be certain to add on a large percentage to tenders if they knew they were to be addressed in blank verse or were to receive heroic epistles. It is, therefore, perhaps prudent to sacrifice reputation for poetry to fees, although of course many architects could with ease ascend to the uppermost height of Parnassus as easily as they mount to roofs. Clients must be served, and as they will have prose without even a figurative expression, the Muse's sons can therefore only give way to the *amabilis insania* in secret, and the Orphic rites have no sympathetic witnesses.

Mr. COTTON, of Birmingham, appears to be curbed by the fear that he may be doing something unprofessional, and when poetising in his volume of lyric and other verses hardly does justice to his talent. He is like a man who has had a chance to design a castle, but prefers to keep to a cottage. His poems are so quiet as to be almost unemotional; one cannot find fault with them, but they do not make the blood run quicker or pleasurably disturb us. The passions which moved poets from the first prattlings of unquiet men who could feel rather than speak are kept at a distance. Mr. COTTON is as safe as if his book were a competitive attempt to be judged by a jury of Miss PINKERTONS. His first verse affords a key to the volume, and he aims at giving the sort of calm he desires to find in an author himself. As he says:—

> How sweet it is, when care invades—
> Or weariness—to seek the shades
> Luxuriously cool, which lie
> Beneath the leafy canopy
> Of some umbrageous elm or beech,
> And there reclining, out of reach
> Of galling sunbeams, soothe the time
> Pursuing some loved poet's rhyme,
> Whose gracious utterance can control
> The perturbations of the soul,
> Awaken hope, and to the heart,
> A pleasurable peace impart.

In so idyllic a spot the rhyme or reason of any "half-mad, half-fed, half-sarkit" poet like BURNS would be out of place, as well as the words of others who wrote out of their hearts' fulness as if they were compelled to be communicative. Mr. COTTON admires BURNS, and writes about him in a manly and reverential spirit; but as architects sometimes have to appear as devotees of a style which is not theirs by choice, so in the present case we find LONGFELLOW is looked up to as an inspiring influence rather than the "rustic bard" who, in his simplicity, imagined that the light which led him astray was "light from heaven." In addressing the American poet Mr. COTTON speaks like a disciple, but one whose love is measured on principle:—

> I love thy rhymes, sweet singer, they awake
> Responsive echoes in this breast of mine,
> For ever, as I hear or read, with thine
> My thoughts in kindred unison combine;
> Yet thought of mine did never yet forsake
> My brain conceived so happily, or take
> Shape eloquent in such wise words as those
> With which thou dost thy sentiments disclose.
> Music doth seem to lend thy poesy
> Her choicest charm; for blending with thy rhymes
> And ancient legends of romantic times,
> Pathos and harmony—in just degree
> Uniting—perfect thy sweet minstrelsy.
> I love those old-world stories thou dost tell
> And love for them begets regard for thee.

* *Song and Sentiment: Lyrical and other Verses.* By John Cotton. London: Simpkin, Marshall & Co. Birmingham: Cornish Brothers.

The master, for so we must consider LONGFELLOW in relation to Mr. COTTON, was never more successful than in dealing in a sort of *belles-lettresish* manner, and according to the rules of a sentimental rhetoric, with old German scenes. Mr. COTTON hesitates about following him there, for very few of the poems relate to Germany. The best is a free translation of SALOMON'S "Fiducit," which relates the fate of the three collegians who loved each other, but were indifferent about the rest of the world. Here it is :—

There lived three genial fellows once,
Friends of a kindred soul,
They dwelt in the same house, and quaffed
The same enlivening bowl.

In festive bouts of gay delight
Their jovial youth was spent,
And nought of mortal misery
Disturbed their blithe content.

At length one comrade passed away,
And soon another died ;
Till, reft of all companionship,
The lone one sadly sighed :

Sighed day by day till night came round,
When they were wont to meet ;
Then filled the flagons as of old,
And placed each friend a seat.

Presiding at the social board,
As though the dead were near,
He sang the old songs o'er, until
His eyes wept many a tear.

One night he cried, "A health ! a pledge !
Why sit ye both so still ?
I drink to you, and stake my life
For friendship and goodwill."

Then clanking cups two ghosts arose ;
Rose solemnly, and said,
"*We take thy pledge*," and at the words,
He fell before them—dead.

It is in a different spirit Mr. COTTON and his friends enjoy or endure life. The "Epistle to a Friend" (a brother architect) represents not only the author's experience, but, we hope, that of many others who find that the love of art is enhanced when it is shared by kindred spirits. We can only find room for the following passage :—

How swiftly flew those intervals away,
Gleaned thus from winter's dilatory day,
When, by thy happy hearth, we turned the page
Of some loved writer, eminently sage ;
Some native poet, perhaps, whose lofty lines
And teeming fancy, charged with high designs
Of noble tendency, our souls set aching
To be in such exalted schemes partaking.
And when, by chance, the conversation turned
Upon our own vocation, how we yearned
For opportunities to teach all time
What constitutes the perfected sublime
In that majestic art—of arts the first—
Grand Architecture, from whose lap are nurst
Transfiguring Sculpture, and her sister mild,
Painting—ideal Imitation's child.

Deserves she not priority of praise
For her solicitude, through lengthened days
Concerning these her kindred, who depend
Upon her care as on a fostering friend ?
Shall either her superior claims condemn,
Whose presence is so vital unto them ?
No ! rather let their just regard be shown
In heightening her attractions with their own ;
United thus, while future ages roll,
They each shall charm the cultivated soul ;
The willing world, surrendering its fields
Shall court those beauties Architecture yields,
And proudly elevate each sheltering dome
That offers Man, and Art, a fitting home.
For Architecture, with creative skill,
Can mould chaotic matter to her will ;
Give it fair form, and make that form conduce
To earth's adornment and to human use.
Kind Nature, too, the lovely and all wise,
From whom our happiest inspirations rise,
Presenting ever an inviting face,
Shall lure fond Painting to depict her grace ;
While Sculpture, in a more material way,
With imitative skill transforms the clay,
And to the yielding marble deftly gives
An aspect that to outward seeming lives.

But what say'st thou, my friend, these fancies seem
As fond, I fear, and idle as a dream ?
For we, unfortunate, denied elsewhere
To raise fair domes, can build but in the air ;
This Age commercial something cheap requires,
And flouts at fine designs and great desires.
Art is so coy and tardy, time so fleet,
We scarce have caught her smile ere we must meet
Lugubrious Death, who, with scant patience waits
Our coming, where she leaves us, at the gates
Of blind Oblivion, perhaps ; whose silent cave
Yawns 'neath that wormy Golgotha, the grave.

It is said by WORDSWORTH that poetry takes its origin from emotion recollected in tranquillity, and the latter may be said to pervade the greater part of Mr. COTTON'S book. We seem to have a survival of that placid, home-loving, contented spirit which was exhibited in the last century, in the verses of the Dr. COTTON whose kindly manner was beneficial as a restorative to the unhappy COWPER. There is no affectation of exceptional power, no attempt to gain sympathy by an exaggeration of the ordinary sorrows of human kind, and no assumption of airs on account of superior powers or virtues. What Mr. COTTON says of the ideal poet expresses no doubt his own aspirations :—

It is his happy vision to convey,
His privilege and glory to impart,
Such animating solace to the heart
As shall its dire forebodings wile away.

The value of the poems is increased by the author's etchings, which form a sort of commentary on the text. It is almost as rare to meet with verses and illustrations from the same hand as poetry from an architect. The volume, therefore, claims notice for more than one reason, and Mr. COTTON has earned the support of his brother architects for proving that construction and fancy can be combined.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third ordinary meeting of the Institute of Architects was held on Monday evening, Mr. J. Macvicar Anderson, president, in the chair.

The PRESIDENT stated that all would regret to hear that Mr. Alfred Waterhouse, who had intended to be present, was prevented attending owing to the death of his brother. That gentleman had been ill for some time, and the hope that he would have been spared unfortunately had not been realised. He called on Mr. John Belcher to open the business of the meeting.

Sculpture and Sculptors' Methods in Relation to Architecture.

Mr. John Belcher said his remarks were only intended as an preface to the subject. Architecture and sculpture appealed to similar emotions. Buildings might impress the beholder, but when sculpture and colour were conjoined with architecture stronger emotions were excited. Of the magnificent independence of their art (architecture) he had not the time to speak. He would make some practical suggestions from his own experience and personal observation. The closest connection, it was obvious, existed between architecture and sculpture. That evening they met as students, for their work would gain in value and force when associated with sculpture. How was this association to come about? Their opportunities were so few, that when they did occur they scarcely were prepared to use them. Clients were little in the habit of spending money for the purpose. The initial difficulty was the cost of sculpture. One way of getting over the difficulty would be by associating the sculptor with the architect early in the work. The sculptor would then be able to give expression to the object of the building, and animate it with life and beauty. Clients would then be more likely to value the force and significance of sculpture. If left to the last, the sculpture would most likely be left out altogether. It was often thought that the finest sculpture consisted in the production of effigies, but it had a higher purpose than that of filling niches with statues. In fact, there was a wide range of work open to sculpture. If they could not have quantity let them have quality. In connection with architecture a building should by no means be considered a mere background for sculpture. Sculpture should be subordinated to the architecture. It was not even necessary that the sculpture should be of the highly-finished character of pediment sculpture. A pure and simple outline was what was wanted. High modellings should be avoided, because they created gloom. The aim should be to make the most of light and not to deepen the shadows. Largeness of scale could be obtained by sculpture. It was important that scale should be carefully treated, or, for instance, the building might become smaller to the eye than it really was. Mr. Belcher suggested

various other ways in which sculpture was of value in relation to architecture. They could only succeed by co-operation and recognising but one art.

Mr. W. S. FRITH said the subject for discussion did not, as he understood it, necessitate considering whether sculpture were requisite to architecture at all. The question, however, was sure to arise. There were no want of examples of sculpture in all styles. It was for them to understand the lessons conveyed by them, and to be able to properly benefit by the labours of their predecessors. In the abstract meaning sculpture was the reproduction of any form from nature or life that was capable of being reproduced in the solid. Sculpture, though in the abstract distinct from architecture, was otherwise intimately connected with it. Its co-operation in monumental architecture served to produce harmony at one time and contrast at another as required. In a building the functions of sculpture were to bear out contrasts of light and shade, to illustrate the meaning of the building and to add impressiveness. The sculptor was thus debarred from haphazard design. It would not be enough that the sculptor's ideas were beautiful; they must also be fitting. Sculpture must fulfil its functions within certain definitely-prescribed limits of space, position, elevation, &c., without looking constrained. It must be in accordance with optical laws to produce the right effect on the eye of the observer. The affinity of masonry to architecture and sculpture was too often forgotten. Mr. Frith outlined the treatment of sculpture in relation to architecture for purposes of giving light and shade, scale and decoration. The great difficulty was to judge of the effect while the work was in progress, the building being enclosed by hoardings, and because it was always stipulated that the scaffolding should be removed at the earliest moment, there was no chance allowed to modify the effect. He also cited several examples, and amongst them the Parthenon Frieze. By use of metopes, and by their treatment of form, the Greek sculptors made their figures look properly from below and perfectly conformed to the building without apparent effort on the part of the sculptors. It was an example of the noblest sculpture in the world.

Mr. T. STIRLING LEE expressed gratification at the desire shown to raise sculpture to its proper sphere. He looked forward to the time when such names as figure sculptors and architectural sculptors would no longer exist. What would happen when architects sent to sculptors for work? The first question would probably be that of cost. If the work were worthy of it, architects would find young sculptors ready to meet them, and it would not be a matter of cost that would stop them taking up the work. Mr. Lee mentioned incidentally the name of the late Mr. Sedding. At such a meeting, he said, they could not pass by the memory of one who had done so much to elevate sculpture as an art. The sculptor from study of the design of the building and the purpose of the building would think out his designs and work out his subject in accordance. The generality were well trained, had an artistic nature, and thus had the ability to compose. Whether the sculptor took animal life, or birds or flowers, he would divine their beautiful characteristics and meaning. Or he might select the human figure. The beauty of lines could not quite be understood without a most intimate knowledge or study of the human figure, the highest ideal of art. Without this knowledge facility of execution was wanting. There was a flow of line through the whole figure, and through every limb, forming a continuous rhythm, or balance of parts. After line the most important study was that of light and shade, or effect. It would take too long to touch on the laws of optics, but few knew what those laws were to sculptors. It was shown in the Egyptian art which was so completely mastered by the Greeks. Sculptors who had studied painting as a rule gave the most beautiful effects of light and shade. Mouldings must be very carefully taken account of in regard to light and shade. They furnished the key-note, and in the finished work the effect would be governed by the mouldings. The question of light and shade was a vital one. When the design was sketched out, it was important whenever possible to have it fixed *in situ*. The methods of executing the work and materials were next considered by Mr. Lee, and as to materials, that evening, he said, he would speak of stone. He took the human figure as the subject selected, and said that two scientific laws, those of anatomy and geometry, entered in, and he explained the different results that would ensue as preponderance was given to one or other of these two laws, and described the treatment of lines and folds in drapery.

Mr. GEORGE SIMONDS remarked that, judging from what was said there and elsewhere, there was little doubt that architects and sculptors had come to the conclusion that if we were to have a correct period of art, it must be the result of a combination of the arts. Sculpture, painting and architecture must not be like three horses put into one omnibus, all pulling in different directions, but the three should work together. Architects might build houses, sculptors put up statues, painters paint easel pictures, and send them to the Academy, the world would wag on, and they would get no further, probably deteriorate. It was fortunate that they were now agreed to drop that system. Sculptors would be found ready whenever their services were wanted to meet the awful question of price. It was an awful question. It was difficult for a man to give up much of his time to secure lower remuneration simply for love of his art. Still he believed there were many who were prepared to do so. He agreed as to sculptors not working by artists' drawings, but working into them. The figures in the charming cartoon shown by Mr. Lee were drawn as the painter would draw them, and could not be reproduced by a sculptor in stone. In drapery the work must be harmonised as a whole, and every frivolous line should be omitted. One great advantage a sculptor had in working for architecture over cabinet-work was that it had a definite place, and was seen under certain conditions, and that a certain treatment of light and shade was necessary. A sculptor should thus be able to produce work much finer than work to be exhibited in a gallery.

Mr. STATHAM said he was somewhat of an unbeliever in regard of the theories advanced in the papers read. There was a tendency to speak of the three arts as if none could stand alone. He had always maintained that architecture in harmonious design and beauty was independent of painting and sculpture, and it was putting it unfairly to say that architecture was incomplete without sculpture or painting. He thoroughly agreed that sculpture in reference to buildings required study and a somewhat different treatment, and should be conventionalised, but he would be surprised to find it thought that the sculptor should give up some of his own art. He (Mr. Statham) wished to stand up for pedestal-sculpture. In regard of the Parthenon frieze he was by no means certain they had not bowed down too blindly as to the perfection of the Greeks. He inclined to think the sculpture was not in the right place. He regarded it as a most beautiful work of art partly sacrificed, and that the Greeks regarded it rather as an architectural ornament than as sculpture.

Mr. STEPHEN WEBB expressed the interest with which he had heard the papers.

Mr. WM. WOODWARD congratulated the Institute on having a member who could teach Greeks where to place sculpture. It was still more satisfactory to find that he had not overlooked the Greeks and their art. Architects might help sculptors in introducing sculpture in the houses of the middle classes, as well as in those of the rich. In one house he had provided niches, and had prevailed on his client to have sculpture placed in them. Well-to-do middle-class clients might be induced to go in for sculpture, instead of wasting their money on paintings.

Mr. PINKER said he could say no more than that he endorsed the views expressed in the able papers read.

Mr. WM. YOUNG said that 10,000*l.* had been allowed for sculpture for the Glasgow Municipal Buildings. There were over one hundred figures, and 40,000*l.* would not represent the money-value of the work. He then described the subjects illustrated by the sculpture.

Mr. HARRY BATES also excused himself from addressing the meeting.

Mr. CONRAD DRESSLER said there was much that was wrong about architecture and sculpture, and which ought to be put right. Some means of combining architecture and sculpture had not been spoken of. The education neither of the one nor the other was satisfactory. Old methods—that of apprenticeship—especially among sculptors, had died out. The apprentice system, which had borne great fruit and encouraged tradition, enabled students and pupils to go forward from where their masters stopped. Would it not be best to take young men into their studios, show them how to work, employ them on their work, and then in time, when they had acquired their knowledge both in theory and practice, let them start on their own account? That he believed was better than sending young men to South Kensington or the Ecole des Beaux-Arts, where they learned only the theory.

Mr. BERESFORD PITE proposed a vote of thanks to the readers of the papers. Perhaps, he said, he might take the opportunity to say that it was a matter of considerable regret to find that several sculptors of the greatest eminence had announced that it was their intention never to read papers or take part in discussions. Had they been present they might, he thought, have altered their opinion. He referred to the Wellington monument in St. Paul's Cathedral, the work of an accomplished sculptor and an accomplished architect combined, Alfred Stevens; a work that they could not hope to see excelled in this century. Would they find another Alfred Stevens in the ranks of architects or of sculptors? If sculptors would take up architecture in their sculpture, there would be a chance of seeing another Stevens or Michael Angelo.

Mr. R. PHENÉ SPIERS, F.S.A., alluded to the contrast in the decoration of public buildings in Paris, Berlin and the chief cities abroad and in this country. Abroad it was recognised that art must be paid for, and must be subsidised, if art of high character was to be had. That was not all. In France students

of the three arts studied together and came in contact with each other. They influenced one another. Architecture was not considered to stand alone, but to have the assistance of the sister arts. Thirdly, figure drawing was a great necessity for architects. Mr. Burges never lost an opportunity of advocating the practice. Knowledge of the subtleties of figure-drawing enabled one to draw all other forms. The French students in their examinations had to show they possessed some knowledge of figure-drawing. As a matter of fact, in their architectural designs they never hesitated to indicate the character of figure and sculpture work they would wish to have. The book they studied chiefly was Flaxman's; it was in every atelier. It was not done here. Unless done when they were students they would never do it at all. He concluded by seconding the vote.

Mr. MACLACHLAN said, on his visit to Germany, one lesson he learned was that we were very backward here as regarded combining sculpture with architecture. The humidity of the air here, redolent with soot, was against clients spending money on what would be totally destroyed in a few years.

Mr. POMEROY said that apprenticeship still existed.

Mr. WM. WHITE, F.S.A., referred to the superstitious fears that accompanied the Reformation in regard of sculpture and painting, which would account for some lack of combination between the arts.

The PRESIDENT put the vote to the meeting, and it was carried by acclamation.

The three gentlemen briefly acknowledged the compliment, and the meeting adjourned.

THE FUNCTIONS OF SUPERINTENDENTS OF WORKS.

ON Monday judgment was given in a case which related to the construction of flour mills and granaries at Rio de Janeiro, but which raised the important question as to the functions of an architect, surveyor or engineer appointed under a contract to see that it is duly carried out, and the liability of either of the parties for any errors of his, and especially for errors of a "local" or "resident" engineer.

According to the *Times* report the contract, made in December 1886, provided that "the work should be done" to the reasonable satisfaction of the consulting engineer of the company (called the chief engineer), and to be duly certified by him when completed, and according to plans, &c., approved by him or, with his consent, the company's resident engineer. The works were to be completed before November 30, 1888, and if delayed by the company, then the contractor to be entitled to compensation, and if caused by default of the contractor, then he to pay 250*l.* for every month after the expiration of the time until the works should be complete, so as to be fit to be opened for use. The contractor was to provide for the company 10,000*l.* in cash for its administration expenses during construction, and was to employ an agent or engineer on his behalf at the works in Brazil, who was to make statements to the resident engineer of the quantity of work executed, &c. The chief engineer was on the completion of the works to give his final certificate. A resident engineer was during the continuance of the contract to be employed at the works, to be subordinate to the chief engineer, and it was to be his duty to measure up the works duly executed, and without delay to communicate to the chief engineer, to enable him to give certificates; and should the resident engineer fail to do so, the chief engineer might give a certificate upon the statement of the contractor if satisfied therewith. Then, by clause 26, "If at any time the works were not, in the judgment of the chief engineer or resident engineer, duly executed, that should be intimated to the contractor by the resident engineer, and if for a month the contractor shall neglect to alter and duly execute the works, &c., the chief engineer or his delegate may take the works out of the hands of the contractor and complete the same," &c. By clause 30, "Every difference or dispute between the company and the contractor as to the meaning of the contract (or specification), or in any way arising out of it or relating thereto, from time to time as it arises, including any act or decision of the chief engineer, shall be referred to arbitration in London." Then there was a detailed specification of the works to be executed, which stated that the term "'resident engineer' shall signify any person appointed by the engineer (*i.e.* the chief engineer) to superintend the execution of the works in Brazil." Much importance was attached to clause 19 of the specification:—"If at any time during the progress of the work the engineer or resident engineer shall disapprove of the materials employed, the contractor shall be bound forthwith to remove such objectionable materials from the works and to substitute for them others of an approved quality, and in case any portion of the work executed shall, in the judgment of the engineer or resident engineer, be considered to be defective or not in accordance with the terms of the contract, such portion shall forthwith be removed and the work re-executed in an approved manner." And by clause 20, "The whole of the work to be carried out to the entire satisfaction of the engineer, and any additional work or machinery that may be thought necessary by the engineer not mentioned in this specification, but thought necessary for the efficiency of the milling plant, shall be done," &c. Such was the contract originally entered into, and under which the works were to be completed on November 30, 1888. It was found, however, necessary—the mills being near the sea—to have a small jetty for the purpose of loading and unloading, and this, of course, somewhat increased the work to be done, and in the making of the sea wall of concrete a soil of mud was used by the contractor, of which the resident engineer disapproved, and this led to a reference to the chief engineer, who approved of the mud, and this caused a delay of some months. Nevertheless, the mills were so far completed as to be ready for work in October 1888, and under a provision in the contract the contractor became entitled to the profits of the working of the mills for October and November, and these profits came, it was stated, to about 1,600*l.*, and on November 30, 1888, the mills were handed over to the company, who had ever since been in possession and working the mills, though not, it was said, for some time at a profit, owing to the non-completion of the jetty, &c. These additional works, however, were completed in February 1889, and the works, in the opinion of the arbitrator, should and might, but for the delay which had intervened, have been finally completed, according to the contract, in January 1889, but were not, as he found, in fact so completed on June 30, 1889. In the meantime the revolution in the Argentine Republic had taken place, and the retention fund having been invested at the contractor's request in Argentine securities, the latter had become greatly depreciated, and in other respects the contractor complained that he had been prejudiced by the delay which had taken place. In respect of these matters he made claims to the amount of many thousands of pounds, while, on the other hand, the company claimed penalties, &c., to the amount of 2,000*l.* These claims were, under the contract, referred to arbitration in London, and the arbitrator's sittings took up twenty-eight days, and the arbitrator made an elaborate special award setting forth the facts so as to raise the question of law, the broad question being whether the company was responsible to the contractor for the consequences of the delay caused by the resident engineer. The arbitrator found that there had been seven months' delay, two months of it owing to the contractor's default, the other five months to the "wrongful and unreasonable interference of the resident engineer," and for this he awarded to the contractor 6,600*l.*, and besides an award for the depreciation of the securities above mentioned, he awarded also to the contractor the sum of 1,600*l.* for the profits of the working of the mills in October and November, 1888, and, in short, his award was substantially in favour of the contractor. The company objected to it on various grounds, the main one being that the engineer was in the position of an arbiter appointed by and acting for both parties, and that, as no action could be maintained by either of the parties against him, so, *à fortiori*, neither of them could maintain an action against the other in respect of any error of the engineer, it being admitted that he had acted honestly.

The Court had taken time to consider their judgment, which at last was delivered in favour of the company, upholding the award of the arbitrator so far as in their favour and overruling it so far as it was against them.

Mr. Justice Mathew said:—The contract was in most respects in the ordinary terms, but in one respect it differed from those familiar to us in similar cases, for it provided that the certificate of the chief engineer should not be conclusive, but that if any disputes should arise they should be submitted to an arbitrator. What happened was this. The plans were approved of and the works commenced. In the course of the works the resident engineer objected, in the exercise of the powers confided to him by the contract, to certain materials proposed to be used and certain structures to be erected. On these objections being made by him the works were suspended by the contractor, and the difficulties which had been raised by him were referred to the chief engineer in this country, who overruled the decision of the resident engineer, and after an interval of five weeks, during which the works were suspended, they were resumed. In consequence of this delay the contractor made a claim against the company, and certain disputes and differences arose between the parties. Before the final certificate of the chief engineer was given in the terms of the contract the works had been completed and handed over to the company, and it was arranged that all disputes should be referred to arbitration, and an award was made upon which the present questions have arisen. Now, the chief claim made by the contractor was in respect of the delay occasioned by the interference of the resident engineer, and it was argued before the arbitrator, and subsequently before us, that the company was responsible for the interference of the resident engineer. It

was said he was the agent of the company, and had interfered as their agent, and that so his acts were the acts of the company, and that as it was an implied condition of the contract that the contractor should not be prevented from carrying out the works, the breach of that implied contract entitled him to damages. On the other hand, it was argued for the company that the resident engineer was not in that sense, if in any, the agent of the company, but that in making the objections he acted in good faith, though he was mistaken, and had raised the difficulties which had arisen in the discharge of what he considered to be his duty as resident engineer, and that the company were no more responsible for mistakes made by him than they would have been for mistakes made by the chief engineer. Now, it follows from this that the question discussed before the arbitrator and before us as to the functions of the resident engineer must depend upon the terms of the contract as to that officer. The resident engineer was to be "subordinate" to the chief engineer, and "the engineer" was to mean the chief engineer, and the resident engineer the person appointed by the chief engineer, so that the resident engineer was to be appointed with the sanction of the chief engineer, and became the resident engineer within the contract. These being the provisions of the contract as to the resident engineer, what is the law properly applicable to such a case? Now it was not seriously controverted that if the mistakes in question had been made by the chief engineer the company could not have been held responsible for them. The learned counsel for the company, upon that question, referred to a series of authorities on that subject. In Clarke *v.* Watson it was held that where by the contract the certificate of an architect or engineer is a condition of the employer's liability, the want of that certificate prevented the contractor from recovering, even though it should appear that the refusal of it was not reasonable. So long as the employer has not interfered and the engineer has acted independently, in such a case it is final and binding upon the parties; it is a quasi-judicial act in the discharge of a duty and involves no liability on either party. In Roberts *v.* The Bury Commissioners the Court pointed out very clearly in what cases one of the parties might be responsible for any interference on the part of the engineer or other analogous officer whose conduct is called in question. There is an implied undertaking as to each of the parties that they shall not interfere with him in the discharge of his duties, and so long as that is adhered to on their part neither party is responsible for the mistakes he may have made. Again, in Stephenson *v.* Watson it was laid down that so long as the architect or engineer has discharged his duty without any suggestion of bad faith he cannot be made responsible for errors of judgment by him in the exercise of his functions. Such being undoubtedly the law as to the chief engineer, does it apply to the case of the resident engineer? In my judgment it does. The resident engineer under this contract is in the position of the chief engineer, who is in this country, and can only act by the resident engineer in the actual supervision of the works. It is expressly provided that the resident engineer is to be "subordinate" to the chief engineer, and, therefore, it appears to us that the same principle of law applies to him as to the chief engineer. It was, indeed, contended on the part of the contractor that the resident engineer was really not discharging any such duties as were imposed upon the chief engineer by the contract, and that he was, in fact, agent of the company, and that when he interfered he was not acting as resident engineer, but as agent of the company, and that, therefore, the company were responsible. But there is not a shadow of evidence that the company in any way interfered with the resident engineer, who acted on his own responsibility and on his own judgment as to what was right. No doubt the company were informed of what was done by the chief engineer, but there was no evidence of any ratification by them of any acts professedly done by him on the part of the company such as would make them responsible for his acts. The learned counsel for the contractor relied upon a clause in the contract under which materials were to be consigned to the resident engineer as agent of the company, from which he argued that he was their agent for all purposes, but that did not follow, and the clause is, on the contrary, strictly limited in its scope. It appears to me therefore, on the whole, that neither of the parties can be responsible for mistakes of the resident engineer, and that on the first and principal head of claim on which the arbitrator has awarded 6,600*l.* to the contractor, he has no claim against the company, and therefore that the award must be altered in that respect. The next question raised was as to the contractor's claim in respect of differences in the value of the securities in which the "retention money" was invested. He was to select the securities, and he selected Argentine securities. The works were handed over, as the arbitrator found, in June 1889 completed according to the contract, but the chief engineer had not given his final certificate. At the date of the award (March last), the arbitrator found that the contractor was entitled in June 1889 to have the final certificate of the engineer, but as the securities still remained in the hands of the company, and the value of the securities had fallen seriously in the meantime, the claim of the contractor was that the company should be held responsible for the difference in value. The question is, whether under the terms of the contract the claim is maintainable. Now, the money was to be invested "in such securities as agreed upon between them," at the risk of the contractor, and shall be transferred at the completion of the contract, &c. Now, the final certificate was to be given by the chief engineer, and as it turned out, he was wrong in withholding it. But upon the authorities cited it appears that the company was not responsible for mistakes of the engineer's. It follows that the loss arising from the fall in the value of the securities cannot be cast upon the company. These are the chief questions arising on the claims of the contractor against the company. Then as to claims made by the company against the contractor under the clauses in the contract as to delay by him. There is a clause in the contract that if from any cause (other than the default of the company) the works should not be completed on November 30, 1888, the contractor shall pay 400*l.* a month until the works should be completed. It seems to us that the words of the contract are too clear to be got over, and that therefore the 400*l.* a month for delay not caused by the company must be paid by the contractor. Then, as to the 6 per cent. interest to be paid by the contractor in certain events, which have happened, until the completion of the works, we consider that this claim also is supported and that the interest is recoverable. It was contended by Mr. Bray (who argued the case very ably for the contractor) that by a supplemental contract the company were to be at liberty to take possession of the works, paying to the contractor the profits up to November 30, 1888, or up to the date when the works were completed, &c. But the clause also provides that it shall not affect the provisions of the principal deed as to the completion of the works and the payment of interest until completion. That appears to us clear and decisive of the question, and this disposes of all the questions raised in the case. We come, therefore, to the conclusion that our judgment must be in favour of the company against the contractor. Lord Coleridge agrees with me in the conclusion to which I have come, though for the terms of the judgment I alone am responsible.

The award was sent back to the arbitrator to be altered in accordance with this judgment.

THE CARRAND COLLECTION AT FLORENCE.

RICH as are the collections at Florence, they have lately become richer still, writes a correspondent of the *Times*, through the important bequest of the late M. Louis Carrand, a Frenchman who had lived for many years at Florence and Pisa. Both he and his father were men of great taste and knowledge, and were enthusiastic collectors of the works of Mediæval and Renaissance art at a time when those things were still to be found, and were attainable by persons of moderate fortune.

M. Carrand *père* was at one time archivist of the town of Lyons, and while France was quieting down after the Napoleonic wars, he was one of the first and best of the students and connoisseurs who made a business of gathering together the treasures that the Revolution had dispersed. He it was who formed the famous Soltykoff and Basilewsky collections, to name only two among several of the wealthy men whom he helped with his advice; while at the same time he kept many choice specimens for himself, especially in the departments of ivory and goldsmiths' work. On his death he left both his collections and his tastes to his son, in whose hands the former assumed large dimensions. Unfortunately for France, M. Louis Carrand happened to be in Paris during the last days of the Commune, and the burning of the Tuileries, and the attempt, which was so nearly successful, to burn the Louvre, persuaded him that no French city was a safe home for the treasures of art. So he migrated to Italy, and when the Government organised the new national museum in the Bargello, he determined to add his collection to the stores of similar works that were there brought together. He died about three years ago, and now, thanks to the energy and skill of Dr. Umberto Rossi, the director of the museum, the many hundreds of objects have been arranged, classified and labelled in four rooms of the old palace. They make a very interesting and important show, and, as one goes through the cases one by one, the valuation of 3,000,000 frs. which has been put upon the collection comes to appear by no means excessive.

It is difficult to choose among the many hundreds of objects which the cases contain, but if we mention a few almost at random they will be enough to show how greatly the Bargello collection has been enriched by the bequest. One of the strongest departments is that of the Mediæval ivories, among which is one of the eighth century with an Anglo-Saxon inscription—a fragment, of which the remainder is in the

British Museum. Another extremely rare piece is a chess-board surrounded with elaborate carvings, a remarkable example of the rude but interesting Burgundian art of the early part of the fifteenth century. But the greatest treasure among the ivories is the celebrated fan, or flabellum, of the ninth century, which was preserved for many hundreds of years in the Abbaye de Journus, where it was described by Montfaucon in his great work. Stolen at the Revolution, this wonderful relic of Mediæval art had the good fortune to escape destruction, and the elder M. Carrand purchased it. For several years the Musée de Cluny made attempts to buy it from him, but nothing came of them, and it has now found a permanent resting place in the Museum of Florence. Of goldsmiths' work there is a large quantity, and though it does not bear comparison with such a collection as that of the late M. Spitzer, it contains much that is of special interest, such as the pierced and enamelled lanterns made in Venice in the sixteenth century, and the French and Italian jewels of the same date. A French brooch, with the head of Diana in enamel—which may possibly have been made for Diane de Poitiers—is hardly inferior to Greek art of a similar kind. The Limoges enamels are historically very interesting, many of the examples going back to the eleventh and twelfth centuries, and a triptych of this same material is important as being one of the two known pieces that bear the signature of Nardon Pénicaud (1470–1540). The bronze medals and plaquettes are all very good of their kind, though they are not numerous; one very rare medal, that of Alessandro di Gino Vecchietti, could not be surpassed for beauty of treatment and condition, or for the wonderful fineness with which the hair is rendered. The collection also contains one of the two or three known repetitions of the celebrated Martelli plaque by Donatello, the original of which is in the South Kensington Museum. Lastly, we may mention a very curious *acquamanile*, or grotesque water-jug in the form of a horse and his rider. The design is not uncommon, but this specimen, which is of the thirteenth century, represents a young king or prince, and the trappings of the horse bear the royal arms of England. Very possibly the figure is intended to represent one of the sons of Henry II.

It is not only by the Carrand bequest that the Bargello collection has been increased of late. We are in the habit of saying that everything in Italy is known; but even now discoveries continue to be made, and Dr. Rossi is one of the happy persons who make them. He has been hunting about in the storerooms and forgotten cupboards of the Uffizi, with the result that he has found medals and plaques enough to fill a large case; and doubtless when these are arranged, as they will be in a few weeks, our knowledge of this branch of Renaissance art will be perceptibly increased. A still more curious discovery was that of a large oval portrait medallion in Limoges enamel, very finely executed by Leonard Limousin, whose signature it bears. Dr. Rossi has not yet identified the subject, but it appears to be some prince or great noble. Such are the "finds" that occasionally reward the searcher even in these days, when everything is supposed to have been long since classified and catalogued.

NOTTINGHAM CASTLE MUSEUM.

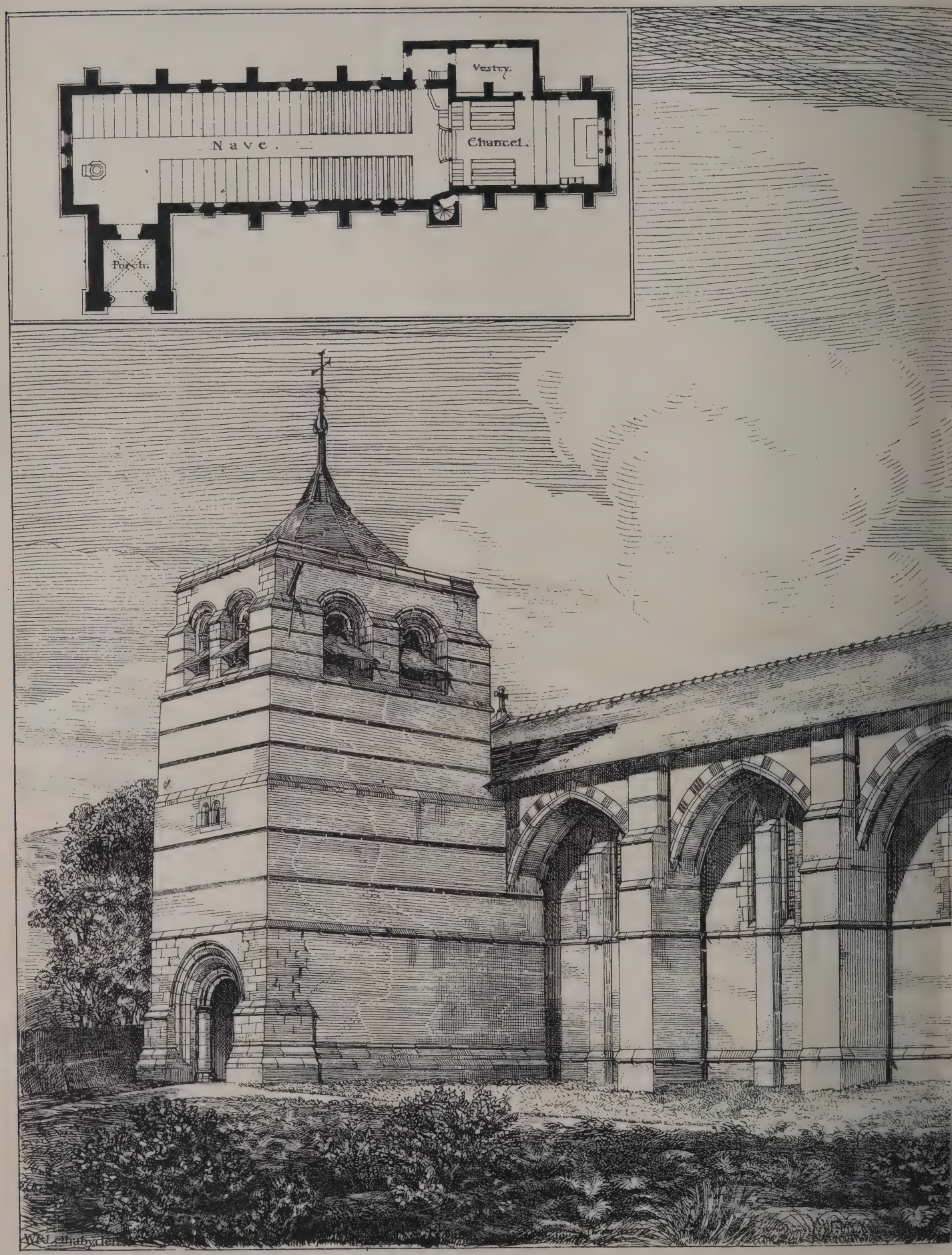
A MEETING of the Nottingham Town Council is to be held on Monday, when a report is to be presented by the Castle Museum Committee as to the completion of the restoration of the old kitchens at the Castle. They state that they have had under their consideration the desirability of completing the large gallery, and the workshops and storerooms situate thereunder, now occupying the site of the old kitchens at the Castle. The Council are aware that in pursuance of the powers conferred on their committee the work of restoration has been carried out to the extent of finishing the external work of the above gallery, workshops and storerooms, and the forming of a new and independent approach thereto. The committee are unanimously of opinion that the time has now arrived when it is desirable and proper that this gallery, workshops and storerooms should be made available for use as part of the Castle Museum. The gallery is 114 feet 7 inches long and 26 feet 3 inches wide, and in its present form is of no service. The committee propose that the large gallery should be floored, ceiled and the walls boarded. They also recommend that the dangerous arches at the west end of the courtyard should be taken down and rebuilt, being of opinion that this is necessary for the public safety. The whole of these works will, it is estimated, cost the sum of 1,100*l*. The committee are unanimously of opinion that the heating of the gallery and workshops and the lighting thereof by electricity should be carried out in such manner as they may hereafter determine. The system employed will be such as to fit in with any action which the Town Council may take with respect to electric lighting. With respect to heating the committee have resolved that the present boiler, which is in a very inconvenient spot, should be removed, and with additional boiler accommodation should be refixed under the arches on the west side of the courtyard. The costs of lighting and heating are estimated not to exceed 1,000*l*. There will be other expenses attending the carrying out of the works, which the committee do not believe will exceed 200*l*., making a total of 2,300*l*. When the above works have been carried out the restoration of the Castle will be complete. The Council are aware that at the present time pictures and works of art have to be stored at repositories in the town at great cost and risk, and at much disadvantage. The committee recommend that the balance of the money for the race fund, amounting to 950*l*. (which the Council on March 2 last ordered to be placed at the disposal of the Corporation for public purposes), should be used in part payment of the above outlay, and that the rest should be raised by loan, or as a direct charge upon the general district rate for the next year, as the Finance Committee may determine.

A COUNTY MUSEUM FOR BUCKS.

ON Saturday a meeting of the provisional committee was held at the County Hall, Aylesbury, under the presidency of Mr. H. Cazenove. Professor Flower, writing from the British Museum, pointed out that a good county museum, well arranged, neat and attractive, might be the means of conveying instruction and giving interest and pleasure to thousands, and that money, time, knowledge and sympathetic care must be expended upon it. Professor Adfred Newton, of Magdalene College, Cambridge, said that the proposal to establish a museum for Buckinghamshire had his best wishes. He advocated the founding of a maintenance fund, which should be vested in trustees. Professor Green, of the University Museum, Oxford, contended that in the proposed museum care should be taken for the proper selection of objects, the primary end being to illustrate the district in which it existed. Sir Harry Verney, in proposing that it was desirable to establish a county museum for Bucks, and that an executive committee should be appointed to take the necessary measures, said that the county had from time to time been the scene of important occurrences in history, and many relics might have been preserved if there had been a central place to store them. He was not in favour of a museum merely for sightseers, but wished it to wield an educational influence, and be the centre of lectures and meetings from which information generally might be obtainable. Mr. Myres, the secretary, pointed out that under the Museums Donations Act a ½*d*. rate might be raised by urban authorities to establish museums on the condition that they were open free three days a week. Professor Herschel advised that technical classes carried on by the county councils should be separated from museums. Sir Harry Verney reminded the meeting of his intention to hand over a collection of curiosities in his possession to the county museum when started. Mr. Gibbs hoped that the property of the Bucks Archæological Society would be handed over to the new county museum. Dr. Walford also intimated his intention of making a present of Anglo-Saxon relics to the proposed institution. The resolution having been unanimously carried, Mr. F. W. Verney proposed that the following be placed on the provisional committee to canvas the county, if necessary, for subscriptions and be responsible for any treasures committed to their care:—Sir H. Verney, Lord Carrington, Mr. W. F. D. Smith, M.P., Professor Flower, Professor Herschel, and Messrs. T. Horwood, Hart, H. Cazenove, A. H. Cocks and Myres. A discussion ensued as to the cost of the proposed museum. Mr. Myres expressed his opinion that at least they would require to raise 3,000*l*. The meeting closed with a cordial vote of thanks to Sir Harry Verney for promoting the movement.

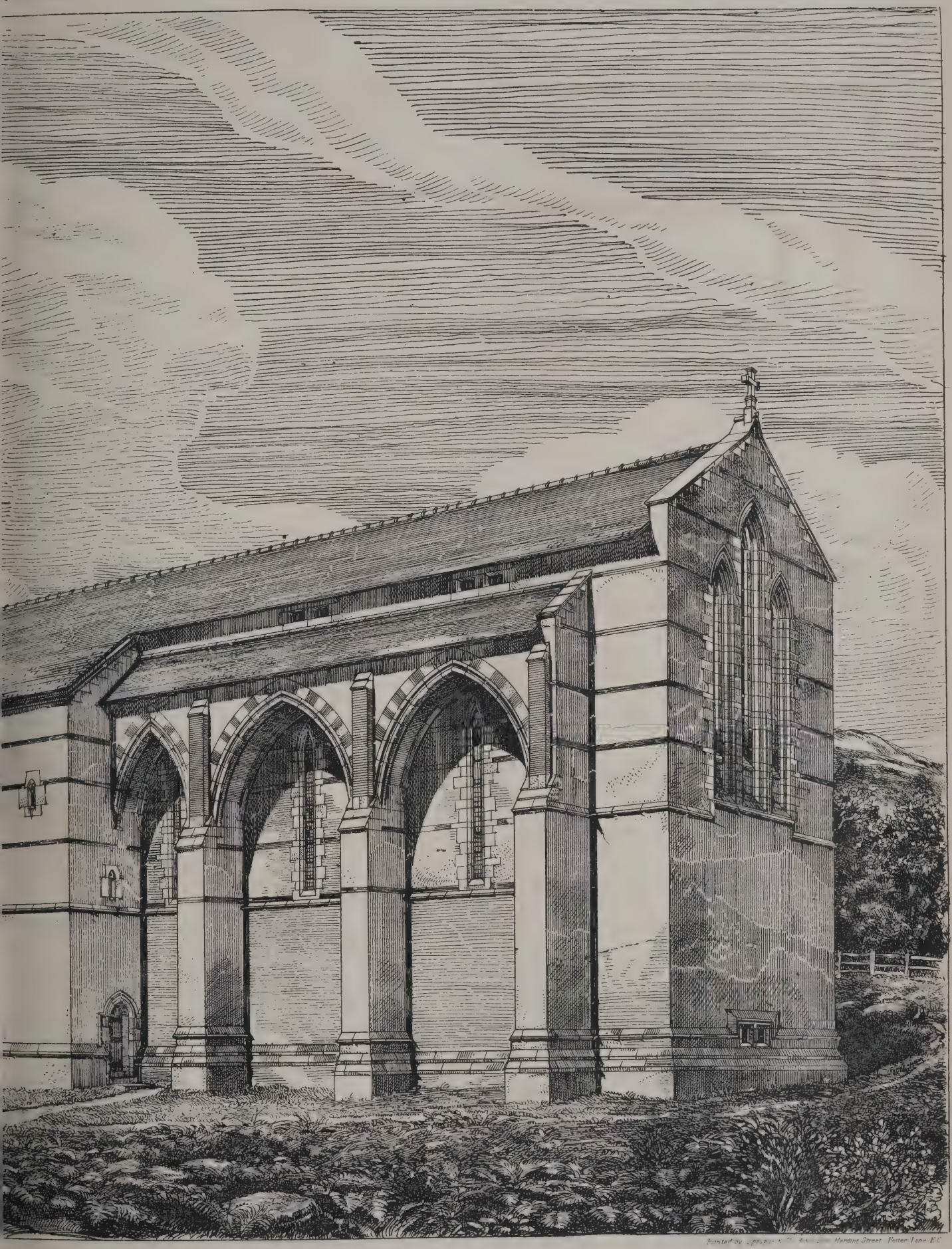
EMPLOYERS' LIABILITY AND SUB-CONTRACTS.

A CLAIM came before Mr. Commissioner Kerr and a jury in the City of London Court under the Employers' Liability Act, which was made by a labourer to recover 234*l*. as damages for serious injuries he had sustained through the negligence of a foreman in the service of the defendants, Messrs. John Mowlem & Co., contractors. The plaintiff said that he was employed by the defendants in bricklaying work on the premises of the Great Eastern Railway Company at Bishopsgate, where extensive alterations were being made in enlarging Liverpool Street Station. A quantity of bricks fell upon him, and he was very seriously hurt, having suffered injuries which might be permanent. The defendants, while regretting the accident, set up a sub-contract between themselves and a person who, as they alleged, employed the plaintiff. This, it was urged, exempted them from liability. The plaintiff said he only regarded the sub-contractor as a foreman. The jury found for the plaintiff for 175*l*.



NEW CHURCH, PO
R. NORI

4th 1891.



ABETH, SOUTH AFRICA.

R.A., Architect.



The Architect, Dec. 4th 1891.

HOUSE AT EASTBOURNE,

FOR Dr ARTHUR OAKES.

LOUIS AMBLER, A.R.I.B.A. ARCHT.



GROUND FLOOR PLAN

SCALE OF FEET

INK-PHOTO SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

The Architect, Dec 4th 1891

Design for a Public Library for a County Town ~ by A. C. Breden





NK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 441.—NEW CHURCH, PORT ELIZABETH, SOUTH AFRICA. [R. NORMAN SHAW, R.A.]

HOUSE AT EASTBOURNE.

THIS house, which has just been completed for Dr. ARTHUR OAKES, is situated in the upper portion of Carlisle Road, on the slope of the hill known as Paradise, overlooking the golf links. From its elevated position it commands extensive views of the sea, the coast, and the inland country. The site slopes considerably towards the south, so that the ground-floor level of the house is some 15 feet above the level of the road, and about 5 or 6 feet above the ground on the entrance or south front, but only a few inches above the level of the ground on the north side. The garden extends northwards to about 250 feet from the house, and a portion of it has been levelled to form a tennis-lawn, 115 feet by 105 feet. Beyond this are the kitchen garden and glass-houses, vineries, &c. The stable buildings are near the north-east angle of the house, facing east, and screening the stable-yard from the house and garden. The walls of the house are of brick, built hollow up to the first-floor level, faced with local red bricks, with moulded brick string-courses, chimney cornices and caps, &c., and stone-dressings to the principal windows and doors on the ground-floor. Above the first-floor level the walls are carried up 9 inches thick, and covered with ornamental tile-hanging, with half-timbered work, overhanging gables, &c. The roofs are covered with Broseley tiles. The interior woodwork of the hall and staircase is of pitch-pine stained green, and includes high dado panelling and a hooded chimneypiece. This and the American walnut mantel in the dining-room are from the architect's designs. Most of the other mantelpieces are supplied by Messrs. C. HINDLEY & Co. The small plans explain the arrangement of the house on the ground and first floors. The second floor contains a billiard-room, play-room, four additional bedrooms, box-room, bath-room and housemaid's closet. There is no basement except a heating-chamber under the hall, approached from the outside of the house. In addition to the fireplaces, the house is heated by hot air, by an apparatus supplied by Messrs. CONSTANTINE, of Manchester, fresh air being brought in from outside, heated and carried through separate flues to each room, the inlets being close to the floor level. The architect is Mr. LOUIS AMBLER, A.R.I.B.A., of London and Brentford, and Mr. B. STEVENS, of Eastbourne, is the builder.

DESIGN FOR A PUBLIC LIBRARY.

THIS illustration is a reproduction of a fine drawing by Mr. A. C. BREDEN, of Moorgate Street, which was exhibited this year at the Royal Academy.

THE ARCHITECTURAL ASSOCIATION.

THE fourth ordinary meeting of the Association was held on Friday evening, Mr. F. T. Baggallay, president, in the chair.

The following gentlemen were elected members :—Messrs. W. Furneaux, L. C. Daviniere, J. Cartledge, G. Newport, P. Dixon, W. Mackinnon and D. G. Salier.

It was announced that Mr. Oliver had offered a prive of five guineas in connection with the Sketching and Measuring Class.

The late J. D. Sedding and his Work.

Mr. H. WILSON said his paper was intended to raise a discussion, and not to be a serious contribution to the history of the late Mr. Sedding. Art was at the present day universally worshipped. The word was in everyone's mouth. Mr. Sedding was born in 1838 at the time when the revolt against pre-Raphaelitism began, and at the time when the Gothic revival began. In his early years he fell under the influence of Ruskin. He studied his works on architecture, and copied his drawings so faithfully that Mr. Kegan Paul said he had great difficulty in distinguishing which was the original. In 1858 he entered the office of the late G. E. Street, but as they did not agree long together he left Mr. Street to join Edmund Sedding, his brother, in Cornwall. He studied Cornish church architecture most assiduously, and was untiring in his wanderings over the county, note-book in hand. These studies permanently influenced his work as a restorer of churches, and enabled him to produce the local colouring and perfect harmony that was seen to exist between his work and its surroundings. He was a great observer and drew lessons from everything, from old work and from nature—birds, animals, flowers, &c. If he had recourse to any examples of this kind, if he brought out a drawing or illustration to prompt him, it served only as a suggestion to bring out his own originality. The two brothers worked together till the death of Edmund Sedding. John Sedding then took up his brother's practice as far as concerned completing the works in hand. After that he left Cornwall, and went to Bristol, and getting no work, he spent his time in making designs for embroidery. In 1872 he married, and his wife had no small share in bringing about his future success. In 1875 he came to London, and settled in Charlotte Street, Bedford Square. Work, though at last it came, was more difficult than ever to get. Alluding to the pleasant home in Charlotte Street, Mr. Wilson said Mr. Sedding exercised great influence over young men. He continued to work hard at textile designs, and during this time of trial gained his knowledge of art. He made personal friends of his assistants and pupils, and Mrs. Sedding worked in the office at her embroidery, and would also make tea for them there. Mr. Sedding had one great gift, that of seeing and of being able to impart sight to others. Mr. Sedding's buildings, compared with the piles of brick and stone of other men that cumbered the earth, were as jewels beside dunghills. His Holy Trinity Church was praised by Mr. Burne-Jones, Mr. William Morris and all true artists. He was the only man of his day who had an idea of the nobility of his art. The Architectural Association was erecting a tremendous bar to art by its new and portentous educational scheme which would flood London with *dilettanti* proprietors of plan-factories. The whole tended to academicism, and it would end in perpetuating the curse of art, viz. the professional architect. Academicism and institutism were the two banes of art. The hope of architecture lay in the extinction of professional architects and the doing away with assistants and the tyranny of the office-desk. Mr. Wilson condemned sweepingly all the existing order of things and announced the workshop as the birthplace of art. The office must be got rid of. The workshop must be substituted. Design was to be committed to craftsmen if it were to be artistic. The workshop was not to be a studio such as the Association was inaugurating. They must work with plasterers, at the blacksmith's forge, and in the mason's shed, and constructional problems would be solved not at a distance, but on the spot. Precious hours of life should no longer be wasted in useless book-learning. Practical knowledge must be gained from actual work. The present race of decorators, carvers, &c., would be abolished, and the so-called practical men of business would be left to attend to the drains and sanitation they loved so well. Mr. Wilson held up Mr. Burne-Jones and Mr. William Morris as his examples of practical knowledge gained by work, and further set down Mr. Sedding as holding the views he expressed. Mr. Sedding, he said, was an artist. He used his workmen's fingers as his own. He hated new workmen. Mr. Wilson made also some remarks on Mr. Norman Shaw and Philip Webb. If matters were gone about properly we should eventually become a nation of artists and craftsmen.

Mr. LEONARD STOKES said, though he first made Mr. Sedding's acquaintance in a commonplace way, he had been filled by him with enthusiasm, and they ended in being fast friends. If Mr. Sedding differed from you, he showed it and laid himself out scrupulously to give his reasons. After alluding to Mr. Wilson's statements as to Mr. Sedding and the Institute of Architects, Mr. Stokes said he did not think Mr. Wilson had intended incivilities to the Association. There were, no doubt, two sides to every question, and the Association must not be blamed for recognising the existing order of things, even if wrong. If Mr. Wilson would change that order of things, they also would change.

Mr. WILSON interrupted.

Mr. STOKES said he would return to Mr. Sedding. Several churches had been built in Bournemouth. He believed that each R.A. had one. He did not mean to insinuate that they were bad, but he came to Mr. Sedding's church with a sense of relief. Church, cloisters and parsonage were each and all perfect. He proposed a vote of thanks to Mr. Wilson.

Mr. E. W. MOUNTFORD said Mr. Wilson was rather wrong in supposing his paper would stir up discussion. The paper had tended to stop discussion, rather than otherwise. He had had the great pleasure of knowing Mr. Sedding, who was always at his best when joining in the excursions of the Association. Everything beautiful excited unbounded admiration in Mr. Sedding. He seemed to have revelled in designs for metal.

work and embroidery. Mr. Sedding's book on "Garden Craft" should be read by every architect.

Mr. C. H. BRODIE said Mr. Wilson's criticism of the Architectural Association and its work would be less scathing when he mentioned that Mr. Sedding had often read papers to them, and joined in the excursions. Mr. Wilson should rather have been thankful to the Association. He (Mr. Brodie) did not like to hear persons say that things should not be done because they could not be done entirely as those people wanted them done. Some men were like the Pharisees of old. They were the gods to be worshipped, regardless of the needs of humanity around them.

Mr. R. D. BLOW thought that Mr. Wilson's intention was not to run down the Association but to help it on. They should take Mr. Wilson to themselves, as he had imbibed so much of the spirit of Mr. Sedding. The Association, Institute of Architects, and Royal Academy—he did not mean to run them down—must do harm.

Mr. OWEN FLEMING said they would willingly take Mr. Wilson, if he could be kept from running off on a track of his own. It was a great pity that a few men, whose work they respected and admired, were going away from them, selfishly it might be said, just at the time when, if good was to be done, it could be done.

The PRESIDENT said Mr. Wilson was mistaken in supposing that he would raise a discussion. Mr. Wilson was therefore probably wrong in his other views. He regretted Mr. Wilson's little outbreak against the educational scheme. It was in the tone of much that had been said before. It could do no good, but it would embitter the breach that was springing up. The vote was then put and carried by acclamation.

Mr. WILSON said he was sorry that what he had said about the scheme was misunderstood. He wanted to help the members. His remarks were only intended as paradoxes. He had used strong language to make them think. He should be happy if he had succeeded, and had done anything to help on a revival of real art.

SOMERSET HOUSE.

A LETTER from Mr. Waterhouse appears in the *Times* in which he says:—Into the controversy, re-awakened in your columns, as to the twofold nature of the architect I do not propose again to enter, as you were good enough to allow me space last year for expressing myself on this subject. There is no doubt, however, that all real architects were, and are, artists. There was one who at the end of last century gave to London one of her noblest adornments in a building all must admire, and which within the last few years has had its beauties greatly enhanced by the formation of the Thames Embankment at its base; so that, I suppose, there is nowhere in London a spot more attractive than the river-front of Sir William Chambers's Somerset House. It is obvious that its immediate surroundings, the river itself, the grand sweep of Waterloo Bridge spanning it and the broad tree-skirted roadway add to the charm of the view. But it is the noble mass of Somerset House itself which gives the keynote to the picture at this particular place. The power of this building to so impress us arises in large measure from its absolute symmetry and balance of parts, from its leading lines being horizontal lines following the river at its base, and from the avoidance of any feature in its sky-line to interfere with the sense of horizontality and repose. It is therefore with more than sincere regret—it is with indignation—that the admirers of this most beautiful creation of that true artist-architect, Chambers, see his masterpiece invaded by a tall erection of stock-brick rising, in part at any rate, out of its very roof at its eastern extremity, and it is with consternation that they learn that this work of destruction by incongruous addition is likely to be carried still further if measures are not taken to stop such desecration. It is not merely that the erection in question is of common brick, in contrast with the Portland stone of Chambers's work. What is most to be insisted upon is that Somerset House being a symmetrical composition, its lines cannot be altered without its charm being destroyed. The inharmonious excrescence which has just appeared above its fair outline may subserve a very useful purpose; but is nothing to be held sacred from the demands of utility? Are our senses so dulled by the hideous sky-signs and other vulgarities under which the London of our day is groaning that we can passively allow one of the buildings of which we have the greatest reason to be proud to be mutilated without a protest? If, as is the practice in Paris, the designs of all structures likely to interfere with our public buildings and our principal street views had to be submitted before their erection to some body of experts fit to pass a wise and unprejudiced judgment on them, some most regrettable blunders would doubtless be avoided.

Mr. Lewis Angell writes:—Some years ago a dining-hall in the basement of King's College, adjoining Somerset House and the Thames Embankment, collapsed, due, it was said, to our neighbour the underground railway, but no compensation was obtained. We are now told by another neighbour, Somerset House, that we must not raise our roof because it will interfere with architectural "repose," but, again, no compensation. In your issue of November 30 Mr. Waterhouse, representing architecture as an art, denounces, with "indignation," the addition to King's College as an act of "desecration," an "incongruous addition" and more of the same kind. But, notwithstanding the abstract righteousness of the æsthetic enthusiasm of Mr. Waterhouse and his forcible repudiation of the "demands of utility," is there not a practical side to the question? When a private owner erects an edifice which he intends shall be "a thing of beauty and a joy for ever," he takes the precaution to secure a surrounding zone which can never be "invaded" by any "inharmonious excrescence," or if he lays out a building estate, conditions are imposed; but when he builds in a street he takes his chance as to the surrounding amenities of the future, and, however æsthetic, it would be neither business nor logic to expect his neighbour to subordinate his interests to sentiment. In the case of Somerset House, the nation is the owner and the Embankment is the street. The nation is very rich; King's College is very poor. The extension of scientific education, "the demands of utility," requires more accommodation, and the college cannot enlarge or change its site, nor afford to erect palatial buildings. If the nation will provide, as it can well afford, the required accommodation, the college, doubtless, will be only too ready to assent and assist, but the college cannot afford to live, nor is it prepared to die, on what Mr. Waterhouse terms "symmetrical composition." By all means let Somerset House "be held sacred," and "measures" be "taken to stop such desecration," but, concurrently, let measures also be taken to maintain King's College in its "very useful purpose" of meeting "the demands for utility." The quotations are from Mr. Waterhouse.

It was announced by Messrs. Stephen Salter & Adams on Tuesday that the brick building was not to be raised any higher.

SHORING BUILDINGS.

THE following judgment was given by Mr. Justice Charles in the case The New Westminster Brewery Company, Limited, *v.* John Rees and Messrs. Grover & Sons:—

In this case the plaintiffs seek to recover damages to their premises at No. 13 Carnaby Street, Regent Street, caused by the negligent pulling down and demolition by the defendants of Nos. 15 and 16 in the same street. The facts are as follows:—The plaintiffs were in September 1890 mortgagees in possession of No. 13 Carnaby Street for an unexpired term of 9¾ years. The premises were used as a public-house and were occupied by Mr. Henry Hilliard, a licensed victualler; No. 14 was occupied by Alexander Smith, a builder; and Nos. 15 and 16 belonged to the defendant Rees. All the houses were very old. They had apparently been built at the same time and were not detached, but were mutually dependent on one another for support. Prior to the month of September, the defendant Rees had contracted with the defendants Messrs. Grover & Sons to demolish Nos. 15 and 16, and on August 23 the work of demolition was commenced. As the buildings were removed "raking shores" were placed at the front and back of No. 14 and "flying shores" across the space left between Nos. 14 and 17 by the removal of Nos. 15 and 16. These "flying shores" were at right angles to the walls of Nos. 14 and 17, and it is proved to my satisfaction that they were five in number. Smith, the tenant of No. 14, said that there were only four, and that the lowest shown on the model used at the hearing did not exist. But he is contradicted by numerous witnesses, and I think his recollection is at fault. Whilst the basement of No. 15 was being uncovered a bulge was noticed in the wall of No. 14 about 9 feet or 10 feet from the ground, which was about 3 feet measured vertically, and somewhat longer horizontally, and according to the evidence of the defendants' foreman, projected about 2 inches. He did not at first regard it as of any importance, but he stated that on September 3 or 4, the same day on which the lowest or fifth "flying shore" was put in place, there was placed against this bulge a small "raking shore." There was a conflict of evidence as to this precaution having been taken, and I do not think the evidence with regard to it is so satisfactory as that which was given about the fifth or lowest "flying shore." Walton, the man who was called to confirm Cattermole on the matter, did not seem to me to have a really clear recollection about it, and it is noticeable that Buckell, his fellow-workman, when called, only spoke to having put up the lowest "flying shore" on September 4, and did not remember that there was any bulge in the wall at all, and in the defendants' answer to the third interrogatory, nothing is said about it, nor, indeed, about the fifth "flying shore." On the contrary, according to that answer

no fresh precautions were taken after August 29, on which day a notice was received by the defendants from the architect of the London County Council that the wall between Nos. 14 and 15 was in a dangerous state. Assuming, however, that all the shoring shown on the model produced was *in situ* on Thursday, September 4, I have now to inquire whether it was reasonably sufficient for the purpose for which it was used. Unfortunately it did not answer that purpose; for on the evening of Sunday, September 7, No. 14 fell into the street, carrying with it in its fall some pieces of the wall belonging to Nos. 13 and 14, and leaving the whole of the wall belonging to the two houses exposed. What, then, was the cause of this collapse? The plaintiffs contend that it was owing to the negligent and insufficient "shoring" of the premises. The defendants contend that it was owing to the inherent weakness and defects of the party wall belonging to Nos. 14 and 15. Now the wall was and was known to be an old wall. It certainly was in some respects indifferently constructed. Mr. Brereton, architect and surveyor, says that he thinks it was originally ill-built and improperly bonded. Mr. Chambers says that the basement was unsound, and that there was no proper bond between back and front. Mr. Robert Kerr says that it was badly built and carelessly bonded. Mr. Grover, one of the defendants, speaks also of its bad construction, and Mr. Cattermole, the foreman of the defendants, says that, although the wall appeared sound, upon inspection after its fall he discovered that there was no tie or bond whatever. "Some of the bricks," he added, "were on end." "The wall looked like a casing with bricks thrown in anyhow. Some of the bricks were half bricks. They were crumbly and all rubbish." On the other hand, Mr. Smith, a builder, and tenant of No. 14, Mr. Charles Fowler, architect, Mr. Hamilton and Mr. Lovegrove, who were called as witnesses on behalf of the plaintiffs, gave a more favourable account of the wall. It was not accurate, they said, to describe it as "not bonded" to the back and front walls. In their opinion it had been so bonded; and it was an exaggeration to describe it as a mere brick casing, with little more than rubbish in the centre. The bricks were not, indeed, regularly placed, but the wall was throughout a solid brick wall. I had the opportunity of seeing the premises after this evidence had been given, and I came to the conclusion that on this part of the case the plaintiffs' witnesses represented more accurately than the defendants' the actual condition of the wall. It was, in my opinion, in fairly good condition for an old wall, and I cannot accept the theory put forward by Messrs. Brereton, Chambers, and the other witnesses called by the defendants, that it slipped down on itself owing to its inherent infirmities. An attempt was also made to attribute the fall of the wall mainly to a defective bressummer. But this was not strenuously insisted upon, and I am satisfied that the condition of the bressummer had nothing to do with the wall's collapse. The cause of that collapse must be sought elsewhere. It is not to be found, I may here remark, in the excavating operations. Upon this point both sides are agreed. No settlement of any kind took place before the wall fell. Again, I do not attribute the accident to the use by the defendants of "flying" instead of "raking" shores. I think they were perfectly justified in using the former. In doing so they were following a recognised practice of competent builders, and, so far as I could form an opinion from the evidence given on the point, I thought that they proved, not only that they practised a well-known method, but that it was the better method of the two. However this may be, it is clear that the use of the "fliers" and not "rakers" cannot in itself be called a negligent act. But this leaves open the question whether the "shoring" was reasonably sufficient, and, after a full consideration of all the circumstances, I have come to the conclusion that it was not. I think that the shoring of the lower portion of the wall was inadequate, having regard to the existence of a bulge of the size and character described by Cattermole. It is said that this bulge was old; but whether old or not I cannot doubt that it was dangerous when the support afforded by No. 15 was withdrawn, and yet, although it was observed on August 28, no step was taken until September 4 to secure the wall. Mr. Brereton says that he should consider a 2-inch bulge rather serious. Cattermole says it was nothing unusual. I think Mr. Brereton was right. Mr. Charles Fowler says that when the wall was exposed this bulging should have attracted the notice of any one of competent skill, and that the lower part of the wall should have been supported by at least three "raking" shores. Only one, on the most favourable view of the defendants' evidence, was provided, and that not until the mischief had been increased, for nothing at all was done until September 4, and in the interval there can be little doubt that the wall had become more insecure than on August 28, when Cattermole noticed the defect in the wall existed. It is to be observed that this bulge, although asserted to be an old one, was not observed by Mr. Kerr, consulting architect of the County Council, on August 26; and I infer that before the 26th and 28th the wall must have been moving, "and if so, then," says the same witness, "special precautions would be necessary." None were taken until too late, and even then no sufficient precautions were taken. In my judgment, therefore, the fall of No. 14 must be attributed to the inadequate shoring by the defendants of the lower part of the party wall between Nos. 14 and 15. This finding entitles the plaintiffs to damages, but I cannot adopt the measure of these damages presented to me by the plaintiffs. They allege that their tenant was obliged to quit the house, and it is true that for a time he was obliged to quit occupation. He could not safely continue to occupy the house until the wall between Nos. 13 and 14 had been properly secured. They further say that the freeholder urged them to rebuild the wall, which, as their term was only $9\frac{3}{4}$ years, they were indisposed to do, and they accordingly surrendered their term. They now ask the defendants for compensation for the loss of the profit which they would have made during the unexpired term. This is not, in my opinion, the true measure of damages. What they are entitled to is the value of the actual damage done to the wall by the fall of No. 14, and also the sum which they would have had to expend to make the wall safe. It may be that the wall would have had to be rebuilt. This must be a matter for investigation by a referee, who will report to me what sum he arrives at upon the basis which I have indicated. I reserve all questions of costs until I receive his report.

THE ROYAL SCOTTISH ACADEMY.

THE prizes obtained in the Life School of the Royal Scottish Academy have been presented to the successful students by Mr. George Reid, the president.

The Secretary read the report of the visitors to the Life School and the report of the Council of the Academy containing their awards. The Chalmers Bursary was awarded to James Coutts Fraser, an extra prize for painting to James Riddel, the Chalmers-Jervise prize for the best drawing from the life to P. P. Mackie, the Maclaine-Watters medal to James Riddel, the Keith prize for the best work by a student in this year's exhibition to John C. Mitchell and David M. Smith equally.

The President then delivered his address. After alluding to the death, since the awards of the Council were made, of a student whose work had been deemed worthy of honourable mention, and mentioning that there was perhaps some ground for believing that the malady of which he died (disease of the lungs, it was understood) was aggravated by, if it did not originate, in the close and hot atmosphere of the Life School, he said that if that were so, it was not the first case of the kind he had known in the Life School. He had long felt that the system followed there of working at night by gaslight was a bad one, and he hoped that by-and-by the Academy would be able to abolish all night-work, and with it all painting by gaslight in its Life School, and that the work there might be carried on, as it ought to be, in fair, honest daylight. Proceeding to refer to the work done in the Life School during the past year, he said he wished it had been his pleasant duty to speak words only of commendation, but that, unfortunately, there was much, very much, still to be desired in the painting and drawing of the students from the living model. There was cleverness, he admitted, in many of the works shown, but mere cleverness without a solid foundation of knowledge was not a very estimable quality in a student's work. Knowledge, accuracy, thoroughness were the qualities to be sought for rather than mere showy brushwork. In the drawings from life the same faults were to be found; while many of them were clever, few or none of them showed any very thorough or accurate knowledge of the human form. The defects to which he had called attention in their Life School work appeared to him to be largely due to a want of thorough training, especially drawing from the antique. It was too much a habit among students to look upon that part of their education as little better than a dreary preliminary, to be got over and done with as quickly as possible. This insensibility to the wonderful beauty of the antique, and especially to the work of the old Greek sculptors, was largely due to the unsatisfactory system of teaching in their art schools throughout the country. The young student found himself in a gallery of casts from the antique. He probably knew little or nothing of the history of Greece, of Greek mythology, or of Greek art; he only saw a number of more or less mutilated figures. The gallery of antique casts was, indeed, like a battlefield after an engagement. It was hardly to be expected therefore that the enthusiasm of the student would be awakened if he was left to work on in a dull, mechanical way; but once get his eyes opened to the beauty and to the meaning of what he was attempting to draw, and the entire aspect of things would be changed. Instead of drudgery, work from the antique would become a source of interest and enjoyment. It was in the hope of awakening a fresh interest in the study of the antique that he proposed on this the first occasion on which he had had the pleasure of addressing them, to direct attention to some influences to which Greek art—and by Greek art he meant exclusively Greek sculpture—owed its origin and development. The President then pointed in detail

to the influences which the natural surroundings, the public polity, the mode of life (notably the great love of gymnastic exercises), and, above all, the religion of the Greeks were bound to exert over their art. The old Greek sculptor had constantly before his eyes the models of manly and womanly perfection and beauty; and if for a moment they contrasted the past with the present, they could not fail to see the enormous disadvantages under which the student of the human form rested to-day in regard to his models. Let them look at the physical and moral degradation of their population, especially in the large manufacturing towns—a poor, puny, white-faced race, poisoned by bad air, and tea, and tobacco, often degraded and brutalised by intemperance, indifferent alike to physical training and to physical beauty. The student of to-day asked for the living model, and the Academy provided the best it could find; but that best was, after all, but a poor thing in comparison with what Greece two thousand years ago could show. If they wished to learn something of the highest, the most perfect type of physical beauty the world had ever seen, or was ever likely to see, they must learn it from the Greek sculptures. They would seek in vain for it elsewhere. Let them not think that when they entered the Life School their study of the antique was ended; rather let the study of the living model send them back to it again with a fresher, keener, more appreciative understanding of its matchless beauty and perfection.

Mr. John Hutchison, R.S.A., treasurer of the Academy, in moving a cordial vote of thanks to the President for his address, said that his (the President's) career as a student, as an artist, and as the head of the Academy and a highly-cultured gentleman, might well serve as an example to those who were beginning their artistic career.

The proceedings then terminated.

SOLIHULL HALL.

A PAPER was read last week, before the Birmingham Archæological Society, by Mr. J. A. Cossins, describing some discoveries of considerable interest which he has lately made at Solihull. Solihull Hall is a moated and half-timbered manorial residence of the fourteenth century, which may be seen peeping out from the trees on one's left at about three hundred yards before Solihull is reached by rail. The place, which is characteristic of the houses of the smaller lords, consists of a great hall in one storey and a transverse building of two storeys, which contains on the upper floor a large room, with an open roof and a dormitory, and on the ground-floor two rooms, which were probably the kitchen and the buttery. The building has been converted into a comparatively modern dwelling-house, and is occupied by Mr. J. Llewellyn Ryland. Additions have been made to it and its internal features masked; but Mr. Cossins has been able to make a complete drawing showing its ancient appearance. The hall is covered by a roof carried by three fine arched principals of different designs. The entrance was by a porch into a passage crossing the hall at the south-west end and divided off from it by a screen. At a height of 7 feet this passage was floored over, forming an open gallery which served for the minstrels when great feasts or festivals were going on, or for the ladies, from which to view the proceedings going on below. At the opposite end of the passage is another doorway, which led into the courtyard, and from the passage also there were doors which led to the buttery and the kitchen. In most halls of any great importance there was at the opposite end a platform or daïs raised one or more steps above the floor, on which was the high table for the lord and his principal guests. But this was not usual in the moderate and small-sized halls, and here there is no trace of it discernible. Beyond the north-east end of the hall Mr. Cossins thinks there was another building, containing possibly the cellar, and possibly some other of the offices. The interior of the hall, and especially the open-timbered roof, is wonderfully like that of Baggilly Hall, in Cheshire, with the exception that in the latter the timbers are cut into trefoils and quatrefoils. The lower portion of the walls has been rebuilt in later times with brickwork, but Mr. Cossins is pretty certain that there were no windows except in the usual place, namely, above the horizontal plate of oak which runs round the hall at a considerable height, where, indeed, he has traced them. Above the plate the walls were built alternately with vertical timbers and wattled spaces of equal width. These walls have served to keep out wet and cold very effectually for more than four hundred years, though their thickness is but 3¼ inches. There is not a crack in the plaster nor the thinnest space between the plaster and the wood. The timbers of the roof are all chamfered and held together by pegs, there being, probably, no single piece of iron in all the framework. Windows of this period were seldom glazed, except in very important houses, and the openings were closed with shutters. There would be a brazier in the middle of the apartment, the smoke escaping through a louvred turret in the roof; and indeed the timbers just above are blackened and covered with soot. The floor was probably nothing but well-rammed earth, which was the custom in middle-class houses. In the two-storeyed portion the principal room is the "solar," a feature of the halls of this century, but lacking when, a century earlier, the king or the lord slept with his retainers of both sexes in the hall. It was the private sitting-room and bedroom of the lord. Here he received his principal guests, and they commonly occupied it with him and his lady at night, though it is extremely probable that screens and curtains were occasionally put in order to secure a certain degree of privacy. Mr. Cossins pointed to evidence in this connection that the lords of manors of that time were more ignorant and possibly less refined than our agricultural labourers of the present day; and recalled the fact that in Piers Plowman the rich were bitterly upbraided for their arrogance in withdrawing themselves from their servants to eat in private rooms and corners. The solar has an enormously massive roof of a remarkable character, of which the central beam in the middle truss is 24 inches deep and 8 or 9 inches thick. Of the moat only two sides remain, but the position of the parts filled up can be traced. Who built the hall is quite uncertain. Dugdale speaks of the Barons Limesie, of Ulverlei (Solihull), and of their estates passing to the family of the De Odinsells. He suggests that the barons lived at Olton, and Mr. Cossins thinks it possible that Solihull Hall may have been the chief seat of the barony. With a view to further illustrate the manners and mode of life of the fourteenth century, Mr. Cossins reconstructed from historical evidence the furniture and decoration of the hall, and quoted from an antique rhyming manual, on the lines of the modern handbook "Don't." He was awarded a hearty vote of thanks, not only for his paper, but for his services to the society during a quarter of a century. In reply he said that somebody should write a history of Solihull, which is rich in materials.

COMPARATIVE ARCHITECTURE.*

COMPARATIVE architecture bears the same relation to historical architecture, or the history of architecture, as comparative ethnology does to general ethnology, or comparative anatomy does to general anatomy. Architecture is not a science; its laws cannot be predicated; it has a personal element, the imagination of the artist or of the architect, which is absent in the true sciences. But it is a subject that may be treated both descriptively and historically, and it is therefore possible to treat it comparatively. Few methods of study have added so much to human knowledge as the comparative. We live in a comparative age. We have comparative zoology, geology, physiology and multitudes of kindred subjects that have opened new fields of culture, broadened knowledge, made us familiar with forms of life and natural laws which otherwise would have been neglected. Some of the most important results of recent learning have been achieved in comparative philology, and in every department that the comparative method has been applied to fresh and important information and greater interest have been forthcoming.

Architecture is the least imaginative of the arts. It is concerned with practical questions, with materials, environment, climate, geology, products of the earth and many other circumstances which make it eminently useful, as they take it away from the artistic. But while architecture is limited by these requirements it is impossible to look for a law of architecture whereby results may be predicated. The possibilities of neither the historical nor the descriptive methods have been exhausted, but the comparative will help to a clearer understanding of our present knowledge, and make future work more intelligible.

To suggest a definition, comparative architecture takes the facts of historical and descriptive architecture, and describes the comparative progress made by all nations under every condition. It takes the substance of the art, its materials, the climate in which characteristic styles have developed, the national or governmental conditions under which they have flourished, the ethnographic relations of the people, the geological peculiarities of architectural districts, the distinctive social and mental qualities, notes the influence of the allied arts, of religion, temperature, use, civilisation, constructive ability and methods, and every cause which in one way or another, to a greater or less extent, has operated in the production and formation of architecture in all times and ages. It is independent of a definition of architecture; it does not matter if climate, country, nationality and other conditions are considered an integral part of the definition of the word or art of architecture. No architecture of any kind is possible without these influences or causes, though their effect may not always be visible, or visible to the same degree. It calls for no straining of definitions to make these things subjects of study, and they

* Abstract of a paper communicated to the American Institute of Architects by Mr. Barr Ferree.

are therefore grouped under what, for want of a better name, I have called comparative architecture.

In a history of architecture composed on the old historical form, the author would arrange his subject in countries, and under each would perhaps note the effect of the various causes that have just been enumerated. The result would be a series of chapters in which the reader would have to begin at the beginning each time, and note the influence of, for example, religion, materials, &c., in each country separately, without having a general idea of the actual manner in which materials, construction, religion, &c., have affected architecture as a whole.

In the comparative method the chapters would be headed, not with names of countries, but with names of influences, as materials, construction, religion, and the effects of each would be noted in their varying degree in each country where architecture had flourished. No general view of the history of individual styles would be obtained by this means such as the text-books now offer us, but comparative architecture is intended to supplement present work and present methods, not to take their place. Architecture is shown as a natural art, evolved under natural conditions, not a succession of historical facts with disputations on dates and problematic conjectures, nor a combination of descriptions giving the numbers of doors, windows, columns and square inches of ornament in every building under the sun. Comparative architecture does not concern itself with the history and description of styles, but with reasons for their existence.

We live in an age of inquiry. It is not sufficient to state facts, it is necessary to give reasons why, and reasons that all can understand. Historical students deem nothing too insignificant for the illumining of the events they describe, and the most microscopic researches have often returned the richest results. Similar researches into the history of architecture cannot have other than beneficial results. Under the treatment here proposed, architecture acquires a new meaning and purpose that it would never have had while viewed solely in the historical and descriptive manner. Styles, methods, results, variations, are explained, and their relationships. Reasons for the prevalency of certain forms under certain conditions are given, and the art appears no longer as the product of the imagination, the creation of fancy, but the outcome of natural, reasonable, sensible, useful, and at the same time beautiful conditions of different natures originating under different conditions.

The more closely the reasons of architecture are examined the less spontaneous it appears, the closer it approaches the domain of law, though without entering it. Ornament remains outside any such influence, and the personal element thoroughly prevents architecture from being regarded as a product of an evolution in the sense that a plant or any animal may be so regarded. But it is not entirely the result of personal whim, fancy, pleasure or imagination. The Assyrians did not build their immense vaults because they pleased them, but from the nature of their climate and the building materials at their hand. It is impossible to refer the production of a historical style to any one set of phenomena; it is not impossible to get further than general groups; but notwithstanding their uncertainty, they show architecture to be a living, progressive, reasoning art, reflecting the deeds and nature of man with a fidelity surpassed by few records.

The influence the comparative method may have in extending popular interest in architecture is not the least important of its elements. The dull record of historical sequences, the detailed examination of styles and their characteristics, the warfares over nomenclatures, the strict chronological chronicling of buildings in all times and ages, will never give the animation to architectural study it so sadly and obviously needs. There is no greater evil in architectural study than isolation. Architectural students forget the co-ordinate relations of their art in its beauty and artistic merit. No just estimate of all the works of men can be possible which does not take into account their buildings, even though their æsthetic value is neglected. Yet historians of architecture do not hesitate to prepare essays in which the great historical events that have rendered the subjects of their discussions possible are ignored or scarcely referred to. A building is a thought, an idea, an intellectual product, and must be treated as such in every intelligent study. Viewed alone, the greatest monuments are deprived of much of their value. The Parthenon, Notre Dame and other great buildings typify ages and intellectual movements as well as developments in construction and epochs in styles. It is not enough to describe them apart from their environment, nor can the men who built them and their intellectual and historical positions be passed over in a few words. It may seem formidable to say that the history of architecture is the history of humanity, and that one cannot be understood without the other; but is it well to continue in present lines if they are not sound or if they do not rest on firm foundations?

Architecture, both as an art and as the science of construction, suffers from a lack of popular interest. It is not popular as china painting, decorative upholstery and other alleged arts are, and both painting and sculpture surpass it in general estimation and interest. It is not exaggeration to attribute much of this indifference to the dull prosing way in which writers on architecture have presented their subject. I am not without hope that the comparative method when properly handled by competent hands may introduce a change for the better. Clearly, if architecture is to become popular, some new method must be adopted for its general treatment. People take an immense interest in many dull and far-away subjects. Lectures on psychology, political economy, even Hebrew and Assyrian are crowded with eager and appreciative audiences. Architecture is surely in more intimate touch with the masses than any of these. If the fault is not in the subject it must be in the methods.

Architecture is now almost the only form of knowledge that is not treated in a scientific manner and viewed as a reasonable product of reasoning minds. The comparative study of monuments now forms the basis of the best work of the most advanced archæologists. But their method is perhaps better to be called analytical than comparative, but in no case does it go far enough. If important events can be ascertained by the analytical studies of co-ordinate groups of buildings, it should not be less valuable or productive of less instructive and interesting results to apply the same method to buildings which are not so intimately related. All buildings are products of a human intellect, and in a certain sense they all have the same end—that of fulfilling some of man's necessities. Architecture is eagerly seized as a subject of study when there is absolutely nothing else to learn of departed races, but when it is one of many forms of remains of past civilisation, it is viewed as an æsthetic art without due appreciation of its proper uses.

Modern architecture, as well as ancient, is a proper subject for comparative treatment. Architecture is limited by circumstances and conditions to-day as in the past; they are not the same conditions, nor do they have the same results, but they still form legitimate subjects of study in the manner here proposed.

CEMENTS AND CONCRETES.

THE first lecture of the present session, promoted by the Leeds and Yorkshire Architectural Society, was delivered on Monday in the Leeds Law Institute, Albion Place, by Mr. Wm. Bruce, F.R.S.A., whose subject was "Cements and Concretes." Mr. W. H. Thorp (president of the society) occupied the chair, and there was a good attendance.

The Chairman briefly introduced the lecturer, who, he said, was engaged in the superintendence of the erection of commodious business premises in Park Row, Leeds. The Chairman further said that the lecture should prove instructive, for, speaking personally, he had to confess that he had not much knowledge of cements, being, like many other architects, largely dependent upon his clerks of works in this respect.

The Lecturer said that if Leeds architects, contractors and workmen were not interested in his subject, he did not know who would be, for it was a Leeds bricklayer who invented Portland cement, though his invention was a dead letter for a long time. It gratified him (Mr. Bruce) to say that he had with him Mr. Jones, President of the Bricklayers' Union in Leeds, who had kindly consented to assist him in his lecture. Proceeding to deal with his subject, Mr. Bruce said that up to the middle of last century England drew its supply of cement chiefly from Italy; but in 1796 a compound of London clay, which owing to its appearance was termed Roman cement, was the subject of a patent taken out by Parker. In 1824 Joseph Aspdin, a Leeds bricklayer, took out a patent for an admixture of limestone and clay, which, from its resemblance to Portland grey stone, acquired the name of Portland cement. This cement, the lecturer said, was of considerable utility in the construction of the Thames Tunnel. In 1848 Britain, he said, had only four important cement works, and the first really important one was started in 1859. Mr. Bruce pointed out that the German cement manufacturers long ago formed an association, and drew up standard rules defining the qualities of cement, and laying down methods of testing, and it was owing chiefly to this wise co-operation of her merchants that Germany was now turning out such large quantities of cement. Hitherto, English manufacturers had not generally seen the desirability of adopting a similar course. After touching on various technical points in relation to cement, Mr. Bruce went on to speak of concrete, and confined his observations in this connection chiefly to technical advice to his audience. Going on to speak of local matters, the lecturer said he had been much surprised and disappointed with the condition of house drainage in Leeds. When he came to Leeds some fourteen months ago, he was surprised to see, and could not understand why, the municipal authorities allowed and approved of such work as could be seen any day in any district of the borough. He had had charge of large and important buildings in many towns, and had met some of the

most intelligent engineers, and their experience of other towns had been that building inspectors and borough engineers had encouraged improvements in sanitary science. But a very short time spent in the Leeds Municipal Department was sufficient to show that the building by-laws were not administered in accordance with the principles of modern sanitation. The great mistake was in the erroneous administration of the by-laws. Very little or no provision was made for the ventilation of house-drains in Leeds; but there was an ancient and faulty system of large gullies discharging into drains formed with injuriously large pipes, badly laid and badly ventilated.

The lecture, which was illustrated by means of samples, tests and tables of test-results, was attentively listened to. Discussion followed, and at the close, on the motion of Mr. C. Myers, seconded by Mr. W. J. Mettam, a vote of thanks was cordially given to the lecturer.

ROMAN COLLECTIONS.

THE subject of the Roman art galleries is still under discussion. It appears, writes a correspondent to the *Manchester Guardian*, that the Government had not been consulted about the removal of the pictures of the Borghese gallery from the family palace to the villa outside the walls of the town. In consequence the Minister of Public Instruction has notified Prince Paolo Borghese that he must replace them in their former position. It is thought that Don Paolo will disregard the order, as he has taken the attitude of asserting the full rights of proprietorship. He has just concluded the sale of the Borghese archives to the Pope for the sum of 250,000 francs (10,000*l.*). The most important portion of this collection is 400 manuscripts which constitute the history of the Popes at Avignon, and which were thought to be lost. The Vatican archives contained no documents of this period. It is now supposed that the manuscripts must have been placed in the Borghese archives by Clement VIII. and his two brothers, the Cardinals Aldobrandini. This sale is not an infringement of the Pacca law, which only extends to works of art. But the Borghese family are in possession of collections as valuable to art as any pictures or statues—manuscripts, majolicas, ancient coins, and a splendid collection of silver belonging to the Princess Pauline, sister of Napoleon. For fear lest these should be disposed of with as little ceremony as the archives or the Cæsar Borgia, the Minister of Public Instruction has issued an ordinance by which such collections will be liable to visits of inspection from the Government, without whose consent they are not to be displaced. Prince Borghese has, besides, been legally warned against alienating any of the works of art in his gallery; but has, as I before said, asserted his full right of proprietorship. The question has been submitted to the Court of Exchequer, and Signor Villari and the Syndic of Rome will shortly hold a consultation on the whole question of the Roman galleries.

The Court is in treaty with Prince Barberini for the purchase of the Barberini Palace, which is to become the residence of the Crown Prince. The sum asked is 15,000,000 francs, while only 10,000,000 are offered.

Correspondence

Architecture—A Profession or an Art?

SIR,—Mr. Woodward's letter to the *Times*, reprinted by you last week, is, I think, the most amusing contribution to this vexed question that has appeared—amusing alike in the comicality of its metaphorical suggestion and its unconscious furtherance of the views it is trying to attack; an unwitting assistance which is none the less diverting because it clearly arises from complete misconception of those views. What are we to make of Mr. Woodward's confession of inability to stand by and see men performing the truly amazing feat of "riding off on the cant of art, kicking up as they go mud at that Institute," &c.? Who could consider such a performance, actual or metaphorical, "quietly"? From this mysterious passage Mr. Woodward passes lightly to an invitation to Mr. Jackson to watch a lay figure for *signs of vitality*, which signs are mysteriously contingent upon that gentleman's acceptance of the truth of five portentous statements.

I have nothing to say against these statements—they are excellent upon the whole; and it is precisely because we admit and feel their truth that we have expressed our views in the memorial which has brought about this controversy. It is precisely because the sanitary, constructive and decorative work of an architect is so often relegated to specialists, because the art of building, the real trade of the architect, is constantly neglected for business concerning building, which has nothing to do with it, and because the best opportunities of the artist are so frequently entrusted to tradesmen, that we strive to free our art from that engrossing professionalism which absorbs so much of the time and energy that should be devoted to it.

Mr. Woodward concludes extremely funnily; he has more confidence, he says, in the "artist, man of science, and man of business" than in "the emotional, maudlin designer of original ugliness, household furniture, paper-hangings and table-covers." A nice derangement of epithets truly. Who would have confidence in a man who was not only emotional and maudlin, but a designer of ugliness, original or otherwise? And why is original ugliness placed in the same contemptuous category with household furniture, paper-hangings and table-covers? Does Mr. Woodward consider the designer of these useful articles to be emotional and maudlin of necessity, or is this merely a decorative flourish to his mysterious epistle?

With the courteous and temperate letter of Mr. J. M. Brydon there is little fault to find. He puts his view of the case with clearness and moderation, but it is not the view of the memorialists, and what he alludes to as "little differences" are to them such great and vital differences that they prevent the acceptance of his kindly invitation "to come in and help their friends inside the Institute."—Yours faithfully,

E. P. WARREN.

18 Cowley Street, Westminster, S.W.:
Dec. 2, 1891.

GENERAL.

The Prince of Wales has purchased four paintings by Messrs. Carlton Smith, J. Macmaster, Charles Mottram and R. T. Kelly, from the winter exhibition of the Royal Society of British Artists.

Mr. George Reid, president of the Royal Scottish Academy of Painting, Sculpture and Architecture, has received the honour of knighthood.

M. Eugene Müntz began his course of lectures on "Æsthetics" at the Ecole des Beaux Arts, Paris, on Wednesday.

Mr. Whistler's *Portrait of My Mother* has been bought by the French Government for the Luxembourg. Some years ago it was exhibited in the Salon. The price paid is nominal, but it will be the sole representative of English art in the gallery.

Mr. R. F. Grantham will read a paper on "The Sewerage of Maldon, Essex, with some Observations on Recent Practice in Sewer Ventilation," at the meeting of the Sanitary Institute, at the Parkes Museum, on Wednesday next.

A Paper on "Ancient Lake Remains at Felstead," by Mr. J. French, was read at the meeting of the Essex Field Club, at Loughton, on Saturday last.

A Pulpit of carved oak, designed by Mr. Ewan Christian, has been placed in Romsey Abbey Church.

Mr. C. H. Bedells, F.S.I., will read a paper on "Party Walls and Party Fences," at the meeting of the Surveyors' Institution on Monday next.

Mr. P. H. Rathbone gave an address on "Water-Colour Drawings," at the Walker Art Gallery, Liverpool, on occasion of the holding the third *soirée* of the season.

Rev. F. F. Grensted, at the meeting of the Liverpool Architectural Society on Monday, will give a lecture on "Egypt as a Home of Early Art."

Mr. G. F. Bodley, A.R.A., has prepared a design for the proposed Archbishop Thomson Memorial, to be raised in York Minster.

St. Anne's Church, Lancaster, erected in 1796, is to be rebuilt at an outlay of between 3,000*l.* and 4,000*l.*

Mr. G. M. Lawford will read a paper on "The Drainage of Town Houses" at the meeting of the Society of Engineers on Monday, the 7th inst.

The Cambridge Antiquarian Society intend to publish the early Grace Books of the University as a memorial of the late Dr. Luard, who rendered many services to the Society.

M. H. Kieffer, a Swiss architect of distinction, has died in Geneva, where he was born in 1840. After studying in his own country and in France, he practised for some years in Italy, where, amongst other buildings, he designed the villa near the Porta Pia, where Victor Emmanuel passed his later days. He received the cross of the Order of the Crown of Italy as a testimony of the King's satisfaction.

The Works to be carried out in the front of Ramsgate at a cost of 60,000*l.* have been formally commenced. The works consist in the building of a front approach to the two cliffs, the construction of a new military road across the inner harbour, and the widening of the approach to the London and Chatham railway station, together with the building of a new custom-house and harbour-master's house.

The Architect.

THE WEEK.

So much vigour remained in M. Alphand in spite of his partial paralysis, that the doctors were to be excused for assuring the people of Paris a few days before his death that his illness was not dangerous. The city has lost in the director of works the most efficient of ediles. The variety of his responsibilities was almost incredible. The paving and cleansing of the streets, the water-supply, the purification of the Seine, the drainage, the public gardens and open spaces, the canals for navigation, the public buildings—in fact, all works which were paid for out of the municipal taxes came under his supervision. In addition, the works of painting and sculpture could not be purchased for the adornment of the city without his advice. The investigations of the history and topography of old Paris were also among the works of his department. His staff comprised architects, engineers, surveyors, chemists, statisticians, meteorologists, artists, archæologists, and one of his chief officers was a poet. His will was law, and many an architectural feature exists in Paris which is contrary to the letter of the building regulations, but which could not be removed because he approved of it. The architects of Paris were well aware of his power and how it would be exercised in their behalf whenever it was a question of saving or sacrificing a good design. M. Alphand was by profession an engineer, one of the representative men of the Ecole Polytechnique. He was brought to Paris from Bordeaux by Baron Haussmann, to whose schemes of transformation he gave reality. M. Alphand was occasionally invited to London to give evidence in support of Bills introduced by the Metropolitan Board of Works, and on all questions relating to municipal works he was the first of authorities. His crowning work was the last international exhibition, and the occasion was utilised to express the indebtedness of Frenchmen as well as Parisians for his numerous services.

A meeting of the Royal Hibernian Academy was held in Dublin on Tuesday, December 8. Mr. William Osborne, R.H.A., was elected a member of Council to fill the vacancy caused by the death of the late Mr. James Farrell, R.H.A. Mr. Thomas Farrell, R.H.A., was re-elected, and Mr. S. Catterson-Smith was elected to represent the Academy on the Board of Governors and Guardians of the National Gallery of Ireland. A letter was also read intimating the Lord Lieutenant's approval of the election of Mr. S. Catterson-Smith as secretary of the Academy.

It is to be devoutly wished that we are not to have any more revelations concerning the Works Department of the London School Board. Mr. Helby, the late chairman of the Works Committee, has, however, described some actions which may be the prologue to an exciting drama. It appears he went to the office to separate papers of a personal character from official documents. He was informed that the letters and the letter-book had been taken. "As many of the letters were of a personal nature," he writes, "I cannot regard such a proceeding as other than an improper act, and one which, as a matter of principle, should be dealt with by the Board. When Mr. Copeland Bowie, in a similar manner, obtained from the clerk during my absence from the Board offices the copying letter-book, I took no notice of the action, as his conduct towards me was uniformly discourteous, but I think that the Board should understand that actions of this kind destroy all discipline in any department, and render the administration of the work more difficult than it otherwise would be." But that is not Mr. Helby's only grievance. He states that a clerk in the architect's department went to the room Mr. Helby formerly occupied as chairman of the Works Committee, after he had been there, in order to go through the papers which he had left in the desk, and the architectural clerk abused the clerk who was, at Mr. Helby's request, burning some useless papers, calling him a scoundrel, and saying that the papers were destroyed in order that they might not be seen. Mr. Helby says that such a remark, reflecting upon the character of a member of the late Board, under whose chairmanship the clerk in question had so recently served, is subversive of all discipline, and calls for the serious attention of the Board, especially as such a statement has no foundation in fact. These revelations do not suggest that harmony exists among the members of the Board, and it would be well to institute some course which might insure a more frank recognition of the right to differ.

The sum of a million francs, which M. Emilio Terry, a Cuban, has paid for the château of Chenonceaux, will form but a part of the expenditure which is involved in the acquisition of so historic a property. The new owner contemplates a reconstitution of the building in order to adapt it to the necessities of modern life. M. Terry is also the possessor of a house in Paris for which he paid over half a million of francs. It is commonly supposed that Chenonceaux was erected by Francis I. for the Duchesse d'Etampes. But the king purchased the place from the heirs of Bohier, a chamberlain and financier. Part dates from 1515. Francis I. intended to use the building as a hunting-lodge. When it became the property of Catherine de' Medicis, who exchanged the Château de Chaumont for Chenonceaux, it was enlarged, but the works of the various periods continue to be sufficiently distinguished, and we trust nothing will be done by M. Terry to remove the characteristics. Philibert de l'Orme was one of the architects employed on the buildings. Chenonceaux passed into the possession of the family of the Duc de Bourbon. In 1733 it was purchased by Dupin, a farmer-general, and one of the conditions of the recent sale was that the tomb of a Madame Dupin, who died in 1790, and was buried in the park, should be respected by the purchaser.

There is probability about the interpretation of Holbein's so-called *Ambassadors* in the National Gallery which is put forth by Mr. C. L. Eastlake. All the previous speculations upon the identity of the figures and the oddly projected skull seem to be unsatisfactory. Mr. Eastlake says there were two men, named Richard Pate and Sir Hugh Askew, about the Court who might have sat to Holbein. Assuming that the two were friends, and like many of their contemporaries were of a humorous turn, there would be no offence against the rules of art then in vogue if a pate or skull were represented askew as a symbol of their unity as friends and as a sort of title for the work. This explanation of the skew-pate is the most reasonable that has been offered. After working out the theory, Mr. Eastlake says he discovered on the dagger of one figure, *ascu* or *asqu quod erat demonstrandum*, which is a further confirmation of his conclusion.

The third division, completing the first volume of Mr. Gotch's work on the Renaissance buildings of England, has appeared. The list of subscribers is evidence of the interest which the venture has excited, for it might be said that the number of names is unprecedented for a work on an architectural subject. In the third part the plates are illustrative of the halls of Kirby, Rushton, Dingley, Lilford, Blickling, Rothwell Market House, Lyveden, Hinchinbrooke, Audley End, Knole House, North Mymms and the porch at Elstow. The plates in style correspond with those in the preceding parts, and when completed there will be an uniformity of excellence which is not always obtainable when works are brought out in divisions.

Some time ago a competition was got up by the Union Centrale des Arts Décoratifs for designs that could be used in connection with electric lighting. French juries in such cases are fastidious, and not one of the designs submitted was considered to deserve a prize. There will, in consequence, be a second competition. It is possible to obtain handsome incandescent lamps and electroliers in Paris as in London, but the Union wished to have something that would not be suggestive of gaseliers. The difficulty of attaining novelty in the form of lamps is almost enough by itself to explain the slow progress of industrial art.

STATE MANUFACTORIES IN FRANCE.

IT is evident from several events which have taken place recently that the administration of the State manufactories in France is yearly becoming more difficult. At the Gobelins M. GALLAND, who was supposed to be the supreme authority on all things artistic in the establishment, has just resigned his office. He discovered that on the most important question, viz. the character of the works that were selected for production, he was not to be consulted. The director of the Department of Fine Arts could not understand M. GALLAND'S grievance, for too many officials are willing to possess sinecures. As became a gentleman who was a sort of compound of amateur, schoolmaster, Government clerk, journalist and busybody, with the defects of each, he sneered at M. GALLAND'S zeal, which to such a mind appeared to be an aping of the autocracy of LEBRUN. The Fine Art Minister, on the other hand, has the sense to perceive that M. GALLAND is right, and declines to accept the resignation. In what way the imbroglio is to end is unknown. At Sèvres it has been discovered that the establishment can no longer be ruled by one man, as in the old days, and it was necessary to appoint no less than three, who are to be independent of each other. It is hoped, however, that they will agree in order to keep the pottery going. There are also difficulties in dealing with the operatives of all the Government manufactories about wages. Investigations have taken place, and it would seem that arrangements are to be made by which the rewards which were established for the benefit of a few individuals are to be converted into a fund which will be available for a much larger number of the employés. It is needless to say the workpeople cannot be made to participate in profits, for there are no results of that kind; in fact, every article produced at the Gobelins, Beauvais and Sèvres abstracts more or less money from the people.

There can be no doubt that far larger sums are wasted than those required for upholding the State factories. But for all that economists are not agreed upon the necessity of losing money on tapestry and porcelain. There was a time when the competition of the factories was advantageous, for the standard of production throughout France was raised in that way. They were also schools for the education of a superior class of designers and workmen. But the condition of trade has changed, and it is with difficulty that Sèvres and the Gobelins can now compete with ordinary works in sending out porcelain and tapestry. When it is seen that the directors of the Government factories are not selected from the official staff but are invited from outside, it becomes evident that excellence of all kinds is attainable in trade.

It cannot be denied, however, that establishments which are supported by the State can occasionally be advantageous. A long course of investigations like CHEVREUIL'S at the Gobelins could hardly be undertaken in a private laboratory, and few manufacturers would care to wait for years without results from the money expended. The search after kaolin in France, which has immortalised MACQUER, one of the chemists at Sèvres, would probably have turned out a failure in the eighteenth century, if he did not go about as a sort of Government official. The sacrifices which BRONGNIART made of his own interests during almost half a century at Sèvres, and by which so many improvements in the processes were realised, would not be accomplished if he were not assured that he was serving his country in a national institution. As regards the relation between the factories and art, it must be said that many judges are in favour of them as aids to improvement. Dr. WAAGEN, who could not be considered as carried away by admiration of anything French, said that a most beneficial influence on a variety of trades and handicrafts was exercised by the Gobelins and Sèvres factories. It must also be acknowledged that the work executed in them was often superior to what was obtainable outside, and in that way the French people were taught to appreciate the best work of industrial artists.

The factories were not, however, established with a view to the benefit of French manufactures, although there were some declarations to that effect. When the weaving of tapestry and hangings was commenced at Fontainebleau, it was owing to the desire of FRANCIS I. to secure the realisation of the designs of PRIMATICCIO, and to have a finer sort of decoration in his palace than was derived by his nobles from Flanders or Italy. The death of the king, and the troubles that followed, put an end to so royal a hobby. When HENRI IV. was desirous to revive it he was opposed by his chief Minister, SULLY, who considered that the money required could be expended more wisely. But the king would have his way, and a company of weavers were installed in the Louvre. They were evidently masters of the craft, for a couple of hundred Flemings were imported to assist them. LOUIS XIII., who came next, may be considered as the chief supporter, if not the founder, of the rival factory, the Savonnerie. During the minority of LOUIS XIV. the tapestry weavers were unable to obtain royal bounties, and their trade could not exist without them. But as soon as the king began to exercise his rights over his subjects' wealth, tapestry was patronised as if it were indispensable for the monarch's pleasure, if not for good government. The dyeing-shed which GILES GOBELINS and his family used alongside the Bièvre stream, which was supposed to be endowed with special qualities for mixing with dyes, was acquired, and became the "Manufacture royale des meubles de la Couronne," although afterwards only tapestry came from it. The factory was intended to be, as the title shows, as much of a royal institution as the kitchens or stables. The artists and artisans of the Gobelins were the king's servants, for at that time in France it was not considered necessary that the revenues received from the people were to return to them through new modes of distribution. The king said he bought the property with his own money. It seemed as if all things needed by LOUIS XIV. must be produced by privileged hands. The Gobelins by itself was unable to meet the royal requirements. In addition the Savonnerie was re-established. Beauvais was founded, and subsidised aid was also promised to Aubusson and Felletin, as supplemental works, which were not, however, required. With an artist like LEBRUN, who seemed destined by nature to be a sort of pictorial historiographer, the employment of the weavers was unlimited. Many other trades went on at the same time under his direction, but somehow the weavers alone were able to hold on by the Gobelins during the vicissitudes which were the products of the king's ambition. Under the two monarchs who followed LOUIS XIV. the fortunes of the factory varied according to the state of the treasury. As the power of the Government declined there was less discipline among the officials, and the Gobelins resembled many of the public departments by its dissensions.

When LOUIS XIV. resolved to establish the looms and produce the costliest *haute lisse*, he announced that he was solely inspired by a desire to benefit his subjects. Tapestry-weaving, it was said, always brought great profit to a State, and it was the king's desire also to make use of such means to help commerce. The people do not appear to have accepted so remarkable a theory in economics. When the Revolution broke out a jury, some of the members being artists, and others being officials in the factories, made inquiry into the productions, and the completion of all that were obnoxious was suspended. The drawing-school was closed, and few weavers were allowed to remain. An appeal was made by them, in which they say that for four months' work they received five days' wages, that they were without food, clothes or credit. But as the armies that were defying Europe at the time were in a similar condition, there was little sympathy for the tapestry-workers.

NAPOLEON, who was desirous to adopt kingly ways, resolved that tapestry should once more be employed for the adornment of his palaces. The weavers were again set to work, and able chemists were placed in charge of the dyeing. The kings who came afterwards were true to the Gobelins, and it was liberally supported by NAPOLEON III. Tapestry was an acceptable present to the rulers of other countries, and a good deal was produced for that purpose, but there is an incredible quantity stowed away in the garrets and cellars of national establishments, as if through fear that if too much were visible the value of the productions of the Gobelins and Beauvais looms would fall.

Under the Republic the Gobelins is tolerated, for even a weaving shed can have some use in politics. A picture that is not suitable for a public gallery may, at the desire

of a supporter in the Chamber, be turned over to the weavers. An artist with a strong sense of decorative fitness may be scandalised, but there are sure to be high officials who can snub all who are unable to conceal their regard for theories that are not in accordance with governmental ideas. It must also be said that noble works are not ignored by the French Government. At the present time there are three designs by M. GALLAND in the hands of the weavers. There are also on the eve of completion works by M. EHRMANN, whose *Literature, Science and Art of Antiquity* was the representative example of the factory in the International Exhibition of 1889; by M. MERSON and M. FRANÇOIS, the landscapist. A series of ten pieces illustrative of the drama has been commissioned for the Comédie-Française, and there is one in preparation for the Odéon. So many works are evidence that, in spite of the opposition to the principle of national establishments, the art of tapestry-weaving is not neglected. And it should be borne in mind that the pieces cannot be longer used to gain credit for any one of the rulers. On that account there is a possibility that idealism may at least find some recognition in the Gobelins. Typical figures like M. EHRMANN's are best adapted for reproduction.

The factory at Sèvres cannot be considered to be connected with royalty in the same way as the Gobelins and Savonnerie. It was created at a time when kings were not above deriving a revenue from their establishments. In 1745 a company was formed to manufacture porcelain. LOUIS XV. had already contributed about 400*l.* towards the experiments, and he subscribed afterwards 100,000 livres out of the 250,000 livres (9,875*l.*) which formed the capital. The works were then at Vincennes. The first production was a vase which was considered to be equal in quality to the porcelain of Miessen. There was much progress, and not only the king but Madame DE POMPADOUR took the greatest interest in the venture. In order to preserve a monopoly, it was decreed that any manufacturer who employed a workman from the royal factory was to be fined 3,000 livres. In 1753 the company was reconstituted, the king took one-third of the shares, it was agreed that the secrets were to be his property, and his monogram was to be on all the pieces that were manufactured. In 1756 the works were transferred to Sèvres. The sales in the next year amounted to 210,000 livres, and continued to increase. The shareholders were, however, discontented, and in order to put a stop to the complaints, the king paid back the sums they subscribed, and thus became the sole proprietor. A few years afterwards the manufacture of hard porcelain was undertaken, and was no less successfully produced, and at the death of the "Bien-Aimé" in 1774 the merit of the Sèvres vases was appreciated in all the courts of Europe.

LOUIS XVI. might have conducted a locksmith's shop, but he was unable to control so important an establishment as the royal pottery. The secrets which were so closely guarded in the preceding reign were divulged, competitors arose and the debts on the works increased. Some of his royalist friends tried to prevail with the king to rid himself of so embarrassing a property, but LOUIS was stubborn, and insisted on its retention, and he promised to pay all expenses out of his own income. He was not long able to try reforms. Under the Republic there was more respect shown for Sèvres than for the Gobelins. But as the Government were without money to continue operations, the good intentions were fruitless. However, in 1800, when BRONGNIART became director, there was a change. He abandoned the manufacture of the soft porcelain, and concentrated all the skill he could secure on work in the hard material. After forty-seven years of most loyal service, BRONGNIART died, and since he passed away there have been able directors. But the manufactory continued to be attached to the king or the emperor, and the pieces bore the monogram of the ruler. At the present time the mark is that of the Republic.

According to M. JULES SIMON, the State should labour to render itself useless, and pave the way for its resignation. The words are applicable to manufactories like those of Sèvres and the Gobelins. The State in respect of them is useless. They are relics of a different sort of Government, and if they are to be preserved it is not necessary to make an elected authority responsible for their success.

ARCHÆOLOGY IN IRELAND.

THE following presidential address was delivered by Dr. Reeves, Bishop of Down and Connor, at the annual meeting of the members of the Royal Irish Academy:—

Our Society commenced its existence on April 18, 1785, and its incorporation was established by Royal Charter on January 28, 1786, nearly fifteen years in advance of the Act of Union, and its constitution is of such a comprehensive and varied nature that it has lived through many trials and survived many dangers, uninfluenced in its growth and efficiency by the elements of discord which often prevailed outside, and guaranteed in permanence by the triple provision of its charter, as expressed in its preamble—"Whereas several of our loving subjects of our city of Dublin and kingdom of Ireland have lately met together for their mutual improvement in the studies of science, polite literature and antiquities; and whereas we are willing to give encouragement to studies of that nature in all parts of our dominions, and more especially in our said kingdom of Ireland, which was in ancient times famous for its schools and seminaries of learning, and hath since produced many persons eminent in every branch of science, and are desirous that useful, curious and polite literature should, under our royal patronage and special protection, continue to flourish and increase." Circumstanced as our poor and backward country has been, no one of these departments of pursuit would have been sufficiently well sustained by members' endowments or zeal to keep up of itself with the course of time, and enjoy a vitality which depended on the interest taken in its proceedings. But in the combination of subjects and pursuits emulation was quickened and co-operation enlisted, and a stability was secured, which, failing one, another was presented, and three agencies from a common centre fulfilled the promise of the Manx achievement—"Quocunque jeceris stabit." To our threefold constitution, not tripartite, but *tria juncta in uno*, we owe the health, prosperity and vitality of our Society England can afford to have a Royal Society for the development of science, a Society of Antiquaries for archæological pursuits, and Society of Polite Literature in its various forms, and history in particular. Scotland also has a Royal Society in Edinburgh, and its Society of Antiquaries, and all in active and useful operation. Here the forces are combined, and the three elements have, by an early very distinguished president, been represented as the impersonation of the three principles—the true, the beautiful and the old. Another, some steps later, following the lead of Lord Bacon, applies the threefold distribution of human knowledge derived from the ancient division of the intellectual faculties of man—memory, imagination and reason. Reason furnishing the knowledge of mathematical and physical science; imagination, including belles-lettres, poetry and fiction; memory, embracing history and archæology. This was so as perfectly applicable in 1856 to our three subjects, and our three committees of seven each. But it has since been found that the employment of these committees was inconvenient and inadequate, in consequence of which the functions of science in its enormous range were continued to one committee of eleven members, and polite literature associated with antiquities to another of ten members.

The former embraces a vast number and variety of subjects much more remote from each other than are polite literature and antiquities; and considering that imagination of one president and fiction of another belonged to polite literature, the experience of this Academy during the first half of its existence bears ample testimony to the exercise of imagination in dealing with such subjects as the round towers, the earthen raths, the cromlechs, the gold cup fibulæ, also of fiction, invading antiquities in the departments of fire-worship, Baals, Belus, the identity of Irish and Punic languages, the aid of Irish in the interpretation of Etruscan inscriptions, and the close affinity of Gaelic and Hebrew. An infinity of such ravings so fascinated the speculative tendencies of those undisciplined by learning, observation or common sense, that it has required half a century to dismantle, if not break down, the rude mental structure of Irish antiquities, which too often employed ignorance as stone and imagination as mortar. While Kirwan and Brinkley were labouring to rectify or enlarge the field of science, a leading member was leading his followers into the most extravagant excesses, with only three redeeming acts of his career, namely, bringing about the presentation of the Book of Ballymote by the Chevalier O'Gorman—the very first gift to the infant Academy; the second the purchase of the Lebor Brec for three pounds, and his apology to the Academy when the book was laid on the table for his recklessness in paying so large a sum—like Malone, who apologised in a letter to Lord Charlemont for his daring extravagance in paying 14*l.* for a first Shakespeare. The third was his collection in Hibernica, a miscellaneous collection of pieces, chiefly done by good scholars, and some by himself, with full swing in his Oriental absurdities. Yet this series, suited to the day, brought him under the notice of Edmund Burke, who regarded the editor's enthusiasm with

great respect, and, inspired by it, induced Sir John Sebright to present to Trinity College the Irish portion of Edward Lhuyd's manuscript, which he had purchased (along with his great Cambrian collection), and this magnificent gift is there, and pre-eminent among its contents is the Book of Leinster—a wonderful bibliotheca of precious contents, upon which, at the instance of this Academy, Trinity College made joint cause with us, and not only lent the MS. for transcription, but defrayed half the expense of the impression, being, I believe, a hundred copies for each, whereby the college, for European donations, and ourselves, to supply the wants of home, provided at cost price. This was a joint procedure between ourselves and another body, which has been productive of the best results. It was thus that the Academy went hand in hand with Mr. George Smith, the publisher and bookseller, and, by its quota of subvention, to secure a sufficiency for the purpose of members, meeting the produce of the public markets, a most expensive work was secured for members at a very moderate cost to the Academy. And so it probably may be by-and-by as regards the Book of Armagh.

"No one science is so little connected with the rest as not to afford many principles whose use may extend considerably beyond the science to which they primarily belong, and that no proposition is so purely theoretical as to be totally incapable of being applied to practical purposes." Substituting "knowledge" for "science," we have abundant examples to show how the handmaids of knowledge can readily aid one another in the discharge of ordinary duty. In the first instance I appeal to the Ordnance Survey of Ireland, which in its results has conferred so many benefits directly and indirectly on our country, and among them the purification of the Academy traditions and the infusion of fresh energy into its constitution. It gave an impulse to patient investigation and inductive conclusions, and it fitted for after life a body of men who, trained in the strictest discipline of mental investigation and exactness, were prepared, when their temporary engagement was concluded, to be the missionaries of sound reasoning and dispassionate judgment in the application of the arts and sciences. It was in this school that Petrie found encouragement and O'Donovan employment. Animation was infused into all that were engaged in the work, and everything was tested by the rules of truth and accuracy. It is now more than sixty-three years since the Ordnance Survey of Ireland was commenced, and whether we regard the immediate undertaking or the impulse which it gave to accurate investigation, we may safely say that no country in Europe has received during the same period so valuable an accession to its internal literature. The landlord, the clergyman, the magistrate have alike availed themselves of the maps; grand juries, poor-law unions, and government of forces have, with equal reliance, had recourse to them for guidance in their several departments, while even the surveyor who is possessed of a pentagraph can now, at his table, more faithfully execute his work than formerly he could have done in the field. As an ecclesiastical record the Ordnance maps are an inestimable source of information. The clergyman who desires to become familiar with the geography of his parish has here an unerring guide; the ecclesiastical antiquary who seeks for information about distant churches here finds an index to all places of religious note, and, whether to define a rural deanery or to delineate a diocese, here are the materials ready at hand, for reduction or enlargement at the pleasure of the employer. But independently of these experiences, the Ordnance Survey was of incalculable benefit to this country. It fostered and developed a great amount of native genius, which but for it might have slumbered and at length have expired unemployed and unknown. The obvious desirableness of establishing a correct standard for the spelling of names so difficult and arbitrary as those of Irish topography suggested the propriety of calling in the assistance of Irish scholars, and the wish to aid the process with illustration from literary sources secured, in addition, the services of our most eminent antiquary. Thus it happened that while the Survey Department, under the admirable direction of Colonel Colby and Captain Larcom, was conducted with unrivalled diligence, the collateral undertaking called into exercise the talents of O'Donovan, Curry and Petrie, a literary trio which would have done honour to any country. In this manner was the foundation laid for a new school of Irish antiquaries, which, disregarding the visionary theories and the wild ravings of the preceding age, preferred fact to hypothesis, demonstration to conjecture, and induction to speculation, so that we might, borrowing the title as they have done the patient precision of their fellow-workers, style them the Ordnance Survey School of Irish Antiquaries, taught, furnished and adopted by this Academy, contrasting them with the visionary leaders who had their day of ignorant dictation, only to gain for themselves a temporary notoriety at the expense of Irish philology and legitimate investigation.

The other case where one branch of knowledge ministered to another in producing a happy result was in a matter which occurred inside this Academy. The late Dr. Todd, F.T.C.D., who from 1846 to 1856 was secretary, and from 1856 to 1861 president of the Society, having learned from Irish history by the statement of a writer who was either himself an eye-witness of the battle of Clontarf or else recorded the testimony of an eye-witness, that on the day of the battle, namely, April 23, 1014, the full tide in Dublin Bay coincided with sunrise, and that the returning tide at evening aided considerably in the defeat of the enemy, being desirous to test the truth of this statement, and thus form a fair opinion of the writer's accuracy, proposed to the Rev. Samuel Haughton, the Junior Fellow and Professor in Trinity College, this simple question, "What was the hour of high water on the shore of Clontarf, in Dublin Bay, on April 23, 1014?" without disclosing the object he had in view in the question. Whereupon Dr. Haughton kindly made the desired calculations, requiring considerable knowledge and skill as well as labour, and having done so communicated the result to our Academy on May 18, 1861, the present Bishop of Limerick being in the chair and myself at hand as secretary. Dr. Haughton, as reported, furnished a brief report of the calculation and of its result, adding, "The result confirms in a remarkable manner the account of the battle and with which I was unacquainted previous to making known to Dr. Todd the solution I had arrived at. I believe that in consequence of the exact information obtained by the Academy in 1851 of the Irish tides that I am able to guarantee the truth of my calculation of the time of high water within a few minutes. The tide was a neap tide, and the moon in her third quarter. From the Academy's observations it appears that on such a day of the moon's age, at the spring equinox, the tide at Kingstown was in full at 5 hours 22 minutes in the morning, from which it follows that the tide along the Clontarf shore, when not obstructed, could not have differed many minutes on April 23, 1014, from 5 hours 30 minutes A.M., the evening tide being full in at 5 hours 55 minutes P.M." Here was science coming to the relief of compartments 2 and 3. It is known to all chroniclers how wonderfully full and accurate the second edition of "L'Art de Vérifier les Dates des Faits Historiques," as compiled by Dom Clement anonymously for the honour of his Order, in which, so long as books or manuscripts were the field for examination, he was perfect master of his subject, while in matters of science, and especially mathematics, the Order possessed no adept, and therefore, aware how important it would be to have the "Chronologie des Eclipses," he succeeded in enlisting the services of an accomplished astronomer, M. Pingre, Canon Regular of the Congregation of France, who accordingly compiled a table of eclipses from A.D. 1 to 1900, which was reported by Le Monnier and d'Alembert to be well worthy of the Academy's approval and printing twenty years before the founding of our Academy. Here, then, is a work of pure science called into the elucidation and satisfaction of history and affording an unerring tribunal to judge between conflicting claims and to correct erroneous statements. It happens that Venerable Bede, when recording the ravages of the great pestilence of 664, in more than one place observes that that year there was an eclipse of the sun on May 3, tenth hour of the day. On the other hand, our annals of Tighernach and of Ulster at the same year ascribe the eclipse to May 1 at the ninth hour, for ordinary historical purposes a microscopic variation, but to an astronomer a vital one. Science now must be the umpire and award the benefit of the decision. So Pengre's Table is called in, consulted, and there we find eclipse of the sun May 1 at three. Unfortunately the 4th must follow Bede. In two of these instances the authorities are detached, but here we have, in our triple constitution, ample resources for indoor decisions in rival claims and ample supplies of supplementary assistance. Before the fusing of the two committees the Antiquity Committee was occasionally exposed to a sneer which would not spare even Jonathan Oldbuck. The consolidation of the committee now gives weight to each :—

> Ephraim non æmulabitur Judam; et
> Judas non pugnabit contra Ephraim.

Who would refuse to Champollion, or Goolefen, or Rawlinson, or our own Hincks, though technically classed in the section of antiquities, a high place in science, deservedly earned by the noblest faculties and exercises of the human mind?

In fine our Academy is a school to encourage not repress knowledge, industry and research; and though we have such names on the roll of mathematical fame as Brinkley, M'Cullagh, Hamilton and Salmon, there is full appreciation of those other eminent members who are in their several departments employed in increasing and refining knowledge without any disparagement. A Laplace is not to make little of a Bowditch—intellectual tyranny or dictatorship is here forbidden—"Urit enim fulgore suo qui prægravat artes infra se positas." The Academy welcomes and honours every man who according to his ability labours to enlighten others, either in the gratification of his own taste or in benevolence to his fellow-creatures: it is only where conceit accompanies ignorance, or error is systematically upheld, that the voice of authority has here any field for censure. In science the Irish are as apt and able as any people; in polite literature also they have the great advantage

of a temperament which is friendly to the impulse of imagination ; but in antiquities the "perfervidum ingenium Scotorum" is liable to excesses in theory, and shrinks from the tedium of cool judgment. Zeuss administers a wholesome caution to such, where he says, "Velim Hiberni nativi ipsi his enucleandis operam dent, sed cautim, sensim, rem non obiter peragentes et modo interpretandi nimium promto," and he said it justly, even as regarded his own endeavours, for in the very next page, where he renders in satire the ancient Irish poem, the "Cris Finnain"—Finnain's Girdle—there was a Hibernus nativus whose vernacular Irish, coupled with the knowledge of its archaic forms and vocabulary, enabled him to correct the halting interpretation of the learned German. At the siege of Flushing the Irish artillery fired three shots for every one of the English corps, with not half the execution. And coupled with this impetuosity of haste, a disposition to jump at conclusions, or accept suggestions without consideration, I would say to the impatient—take time. "Quod non affert hora, plerumque præstat mora." What were the views of Mr. Burke, and what his expectations from the University and the Society of Antiquaries will best appear from his letter of August 15, 1783, addressed to General Vallancey. In this he says :—"I shall tell you what a judicious antiquary about twenty years ago told me concerning the chronicles, in verse or prose, upon which the Irish histories and the description of antiquaries are founded, that he wondered that the learned of Ireland had never printed the originals of those pieces, with literal translations into Latin or English, by which they might become proper subjects of criticism, and by comparison with others. . . . If I were to give an opinion to the Society of Antiquaries I would propose that they should be printed in two columns, one Irish and the other Latin, like the Saxon Chronicle, which is a very valuable monument, and above all things, that the translation should be exact and literal. It was in the hope that some such thing should be done that I originally prevailed on Sir John Sebright to let me have his MSS., and that I sent them by Dr. Leland to Dublin."—(Edw. O'Reilly's "Translations of the Iberno-Celtic Society for 1820," pp. ii. iii.)

As regards the ancient literature of Ireland, I deem it a privilege that there are now within the compass of this city a larger and richer collection of Irish manuscripts than ever have been assembled there since the Conquest. First and most considerable is the Irish group in Trinity College, the gatherings of Ussher, Lhuyd and other benefactors. Secondly, that of our Academy, which nearly approaches the former in number and importance, the gatherings of a century and the donations of a few benefactors, but chiefly obtained by purchase. To these are to be added the Government deposits of the Irish portion of the Howe manuscripts, collected by the two O'Conors, and of extreme value. Thirdly, the St. Isidore's collection from Rome, at the Franciscan House on Merchant's Quay. Fourthly, Primate Marsh's Library, where there are a few good Irish manuscripts. Between these various depositories there exists a very friendly disposition to further the common cause of the practical development of their literary materials. In this cause the Academy has taken the initiative with great heartiness and success in its publication of Irish Texts. During the last twenty years it has published in admirable facsimile—First, the Clonmacnoise MS. of 1106, known as the Leber nah Uidhre, containing 134 pages and preface, 1870, copied by Joseph O'Longan. Second, the Leber Brec, an inestimable MS., obtained by the Academy in 1789, large folio of 131 leaves, exquisitely copied by the same scribe with wonderful fidelity. 3. The Book of Leinster, belonging to Trinity College, but entrusted for transcription to the Academy, and half the expense of publication borne by the owner, 411 pages of text, with a very learned introduction by Professor Atkinson of 90 pages. This was copied by the same scribe, and is a marvellous evidence of his skill. Published in 1880. 4. The Book of Ballymote, an Academy MS., by photography. A noble manuscript, as true and as easily read as the original. The text, 502 pages and preface of 22 pages, by the same editor. 5. The Yellow Book of Leacan, in process of being photographed. 215 pages printed off, and 40 more ready for printing, are reported in the minutes of the stated meeting in March. While on this subject of reproduction, I may be allowed briefly to advert to the work of the most famous Irish scribes of modern times. The first of this class is Michael O'Clery, whose beautiful writing, so free and elegant, is specially observable in two MSS. of the Academy. The autograph Annals of the Four Masters, of which the first portion is preserved in the Stowe contingent and the second in the Academy collection. The most beautiful handwriting is that of Professor Eugene O'Curry. There is an abundance of his work to be seen in the Brehon Law Transcripts and elsewhere, but more especially in the magnificent folio, his transcript of the Book of Leacan in the Academy collection, made for and preserved in Trinity College. The treasure in the Government building, was collected, formed, arranged and described by the Academy that was, under Government, invested with the charge of the best remains of Irish art and veneration, and under privileges conferred by Government, it had to a great degree attained to its present dimensions. The gifts and trusts, for the public convenience, were voluntarily handed over by the Academy, reserving to the Academy the privilege of its management, and the appointment of its curator. The transfer of the Royal Irish Academy's Museum, *servato nomine*, to the new depository was a wise and useful arrangement. There the Academy's function of promoting antiquarian knowledge through the medium of the eye, rather than the ear, will fulfil the poet's estimate of visual impressions :—

> Segnius irritant animos demissa per aurem,
> Quam quæ sunt oculis subjecta fidelibus, et quæ
> Ipse sibi tradit spectator.

By the removal of our museum to the National Repository in Kildare Street the Academy lost last October a great attraction and outward sign of its antiquarian commission. Its galleries and strong room were the depository of a collection, in some portion of it, not to be matched in Europe. But it was hampered and crowded and ill-accommodated, so that its removal was a great gain to its own credit as well as the convenience of the public, in its present ample disposition. Further, a large portion was either directly or indirectly the gift of the Government, and to some extent at its absolute disposal, and the wishes of the Government were too explicit and express to admit of any parley, so that on calm consideration the Academy came to the conclusion that on certain conditions the museum in its entirety should form a prominent feature in the grand display. Members lost hereby the ready opportunity of having original articles at hand to illustrate the subjects of certain communications, or direct the attention of a visitor to a place in the room above. The rapid growth of the library had begun to demand more accommodation for books, and the retirement of the museum afforded the required space. This is an opportunity to make it known and understood that the Museum possesses a copy of Friar O'Mellan's "Irish Journal of the Rebellion of 1641." It is a faithful copy of the original, which is in my possession, and the copy, a *chef d'œuvre* of penmanship, belongs to the Academy. John O'Donovan also wrote a very neat and graceful hand. A great deal of his work is to be found in the series of Brehon Law reproductions. But of all the scribes none did so much work and so constantly as Joseph O'Longan, who was the Academy scribe for years. He was an excellent Irish scholar, and his power of imitation in the various features of different manuscripts was only equalled by his fidelity. The three great facsimiles above-mentioned are evidences of his wonderful application and perseverance ; steadily he held on with his work in all weathers and under all circumstances, and his performances will ever remain to his great credit and the honour of the Academy. By means of these works, copies of which have been widely distributed among the learned of Europe, students of the ancient Irish will have the most abundant materials and the richest texts. It is impossible to over-estimate the importance of this portion of the Academy's work.

The Lord-Lieutenant moved the vote of thanks to the President for his address.

TESSERÆ.

Terra-cotta in Building.

THE artists of the Roman period made free use of clay, wherever it came to hand more readily than stone. They learnt not only to use it in regular layers of brick, as we do, but to mould it to all the elegances of ornamental form, all the details of rich architraves, capitals, friezes and engaged forms of sculpture. In some cases, as in the Amphitheatrum Castreuse and the temple of the god Rediculus, the material was wrought into form by the chisel. In modern Rome, as Hope pointed out in his "History of Architecture," very great use was made of brick until a period comparatively recent. Of the grand Farnese Palace began by Bramante and finished by Michel Angelo the plain surfaces are of brick, though so exquisitely laid and of a texture so delicate as to be taken by the superficial observer for stone. On this side of the Alps clay has never been moulded into forms to rival those of Italy. Still, in the South of France, particularly at Toulouse, remarkable examples are to be seen. In the valley of the Elbe, where the same deficiency of stone compelled a resort to the use of brick, there was never any approach to the refined ingenuity of Northern Italy. At Lübeck, however, the cathedral and the church of St. Mary are respectable specimens of the style. In the Marien Kirche, at Brandenburg, ornamentation is carried to excess. Hanover and other towns furnish picturesque examples, some of which may be seen in Mr. Fergusson's "History of Architecture." England at one time possessed a brick architecture of no mean merit. If less inventive in form or less rich in ornamentation than foreign models, it was at least simple, natural and eminently fitted to the climate. Many a fine specimen of the old English grange,

or of the more stately mansion of the Tudor and Stuart periods, still perpetuates a native type of architecture singularly suggestive of comfort. To the high fiscal duty and its ensuing restrictions is mainly due the degradation of brick in more recent time. The villanous imposture of stucco, aided by the contract system of building, completed the ruin of the style. The legal English brick became at once the least desirable and the most unsightly material that any country could show—the type of all that was bare, mean, ugly and false. It was especially in the plains of Lombardy, where building stone is rare, that the great impulse was naturally given to the use of natural earths for building purposes. There, in edifices of the highest architectural importance, we find clay during a long period not only used for the purpose of solid construction, but also moulded into forms so exquisite as to take its place as a material of high value and dignity in art. So rich is Lombardy in early works of terra-cotta as to be fitly called by Hope "the great country of brick." Among the most ancient remains of the kind, M. Ottolini calls attention to the crypts of the church of Lenno, on the Lake of Como. There sundry relics are still extant of colossal statues in terra-cotta "of a close-grained and tough consistency," all of which the writer considers clearly to belong to the constructions of Christianity. The use of terra-cotta followed the fortunes of successive schools of art in Italy. Both in sacred and secular architecture it enables us to trace the development of taste. The golden period of the art was marked by a wise sobriety and simple severity of ornament, with a scrupulous care to confine the material within its appropriate limits of style. In the hands of the gifted architects who flourished along with Lucca della Robbia, the pre-eminent modeller in terra-cotta, ceramic ornament entered into all that was purest and most noble in the arts of design. Crema, Chiaravelle and, above all, Pavia were the headquarters of this graceful school. At Milan, in the Ospitale Maggiore and the Castiglione Palace, were exhibited the arabesques and medallions of the cinque-cento period. In the subsequent age, in the hands of the so-called imitators of Michel Angelo, art, overpassing the boundary line of truth, lapsed into exaggeration. The severe, modest and delicate beauty of terra-cotta refusing to lend itself to the contortions and imitative tricks of the barocco or rococo style, the entire art soon fell into decay and eventual oblivion.

Thorvaldsen the Sculptor.

Like most of the great officially recognised celebrities in modern art Thorvaldsen tied his little boat behind the good old ship the Antique, and was towed triumphantly into port. There was a time—and this sculptor had the good luck to establish himself in Rome exactly at that time—when the princes and great people in Europe were much interested in antique art. They were not very particular about the quality of it; they felt about antique art generally a readiness to accept anything it had to offer, something like the disposition of many country clergymen in regard to Gothic who have a reverence for pointed arches and old tracery generally, and have not yet acquired the audacity to discriminate between the good and bad art of the Middle Ages. Thorvaldsen fell in with the humour of the time and produced works which entirely satisfied his patrons. They all seem to have been perfectly delighted with him except with his tardiness in the delivery of work commissioned. He would accept any quantity of commissions and establish any number of studios, where he kept a staff of workmen constantly employed in copying his clay models. He understood the art of economising his own labour and worked but little in marble, retouching the statues made by his workmen but not carving much himself. His view of the art of the sculptor was that unfortunately too prevalent in modern times, that it consisted in making clay models. Even in the clay itself Thorvaldsen found means of availing himself of the labours of others. He often sketched the subject roughly in clay, then entrusted it to one of his subordinates to work up to a semi-finish and retouched finally himself. The quantity of work he left behind him would seem inexplicably large if these facts were not taken into consideration. It must also be remembered that his life was exceptionally long and laborious.

Deviations among Copies of Ancient Statues.

The repetition of the well-known satyr of Praxiteles, known in ancient times by the distinctive appellation of "the famous," in the Braccio Nuovo of the Vatican, surpasses in the extremely delicate and life-like treatment of the nude portions, particularly of the upper part of the body and arms, even the Capitoline statue, usually considered the best specimen among the numerous copies of this figure. Although it may seem rash to attempt to come to any conclusion, founded on the artistic excellence of this work, as to the style in which the original of Praxiteles was itself executed, we may yet infer from it that endeavour to vie with nature in a certain direction into which the copyist has been impelled by his prototype. With repliques of the celebrated masterpieces of antiquity, the case must have been much the same as with those of Raphael in our own day, when copies of his pictures exhibit much more the excellences and peculiarities of the school to which the artist belongs, and of his own gifts, than the immediate beauties of the original. Even the prevalent feeling, in a reproduction thus given in a creative spirit, must chiefly be regarded as the reflection of the frame of mind of the copyist himself. Hence it becomes the business of the historian of art, by an analytical process of no small difficulty, to establish those elements which constitute the essence of the original work in question. Science has, however, still far to travel before reaching this point, and so long as the archæologist does not endeavour to cultivate his eye methodically, and learn to direct his attention to the essential, no aid is to be expected from this quarter for enabling us to comprehend the artistic historic significance of works that have come down to us at second and third hand. Were any one really desirous of arriving at a scientific result by such a comparison of the peculiarities of style to be met with in the separate repetitions of the same original, a collection of casts, if not of the whole work, at least of the most important parts, would be indispensable. But where, in our days, is the director of a museum to be found who would willingly even take charge of so costly an apparatus? Would not that show-room harmony, usually much more aimed at than genuine instruction in the formation of such collections, be disturbed in the most displeasing manner by so lavish a display of these *disjecta membra poetæ*. And yet the most surprising results of a not merely theoretical, but really practical, benefit might be expected from an experiment having no other object than to bring together all that still remains to us, in scattered fragments, of the most celebrated antiques. We should thus get rid of whole loads of learned archæological lumber, and, at the same time, gain a solid foundation for a science the possible existence of which is, with most persons, a matter of doubt. Our object in all this is to direct the attention of the lover of art to the advantage to be derived, for example, from a comparison of the plastic formations we possess in the numerous copies of the Faun of Praxiteles. With the help of such a collection we should be able in the course of a month to diffuse more correct notions of art than can at present be gained during the academical triennium. In the present state of archæological science, we must not be surprised if it is in danger of falling altogether into disrepute, as those who stand pledged to further its interest seem to conspire only for its ruin.

The Cathedral of Moscow.

It appears to have been usual, when the construction of a building of importance was contemplated in Russia, to apply at Constantinople for experienced architects, to whose skill the undertaking might be committed. When Moscow was in want of a cathedral, however, in 1473, the Greek Empire had ceased to exist; and the Russians, unaccustomed to look to any other foreign quarter for assistance in their architectural concerns, determined to confide the execution of the work to the less trustworthy hands of native artists. The foundation was accordingly laid in the presence of the Court and clergy; and the progress of the building at first seemed to promise the most successful results. Already had the walls of the church attained to their intended height, and nothing was wanted but to close in the arches, which were destined to constitute the roof, when, unfortunately, this critical *labor ultimus* proved more than the mastership of the Muscovites could manage, and like the finishing card of a nursery castle, precipitated in a moment the whole building to the ground. This disappointment, however, though it discouraged for a time the development of national ingenuity, was by no means so unfavourable, as might have been expected, to the propagation of architecture in Russia, since it led to the employment of Italian artists and the consequent magnificence of the Kremlin. Ivan III., at that time Grand Duke, resolved to despatch an embassy to the republic of Venice, of which an essential and the principal object was to procure at any price a good architect. The artist engaged by the ambassador was Alberti Aristoteli, a native of Bologna, a man of considerable reputation in his own country, and who had even been invited by Mahomet II. to superintend his alterations at Constantinople. It was probably for the purpose of making himself master of the necessary distribution of a Greek church (with which, as a Latin, he may be presumed to have been previously unacquainted) that Aristoteli made it his business on arriving in Russia to visit the ancient cathedral at Vladimir, which, though sacked and ruined by the Tartars, was still considered by the Russians as a *chef-d'œuvre* of art. Returning to Moscow he proceeded to lay the foundations of the present cathedral, which was begun in 1475, and being brought without accident to a happy completion, was consecrated by the Metropolitan on August 12, 1479. Though the work of an Italian, it must not be supposed that this church has any great similarity to those of Italy. Some, indeed, of the ornaments of the exterior are such as may possibly have been borrowed from churches of the Lombard style, but even these (perhaps from their comparative paucity) bear an infinitely more striking resemblance to the works of Saxons and Nor-

mans. The arch of the great southern door in particular is like those which are usual in all our more ancient churches; the windows, as in them, are narrow, round-headed loop-holes; and the range of small arches which runs round the building at a considerable height from the ground might even be mistaken for a Norman decoration. Notwithstanding the appearance, however, of a few of the details, the general character of the church is decidedly Græco-Russian. The Byzantine model, indeed, was probably prescribed to the artist, and accordingly, as at Novgorod, the ground-plan is nearly square, a small projection serves for the sanctuary, and the roof is supported by four large piers. The only essential improvement to be observed in this church, when compared with former architectural attempts in Russia, is the superiority of its general elevation, which allows a degree of loftiness to the interior before unknown. Upon the whole, however, it must be confessed that, as a work of so late an era as the fifteenth century and the great metropolitan temple of an (even at that time) considerable nation, this brick-built edifice is only calculated to excite astonishment from the primitive rudeness of its appearance, and in point of real architectural merit can never, with all its gilding, be brought to stand the slightest comparison with the contemporary structures of the west.

Roman Gardens.

The Tusculan villa of Cicero, though often mentioned, is not anywhere described in his works so as to afford an adequate idea of the style in which his grounds and gardens were laid out. There is little to be traced in Virgil. Pines were probably a favourite ornament, and flowers, especially roses, were highly esteemed. The Pæstan roses were chiefly valued for their excellent odour, perfumes, indeed, having been always highly valued in warm climates. There appears also to have prevailed among the Romans a piece of luxury which is equally prevalent with ourselves, namely, the forcing of flowers at seasons of the year not suited for their natural bloom, and roses were then the principal flowers upon which, as we gather from Martial, these experiments were made. Pliny tells us that the place of exercise which surrounded his Laurentine villa, used by him as a winter retreat, was bounded by a hedge of box, repaired, where necessary, by rosemary; that there was a vine-walk, and that most of the trees were fig and mulberry. Of his Tuscan villa the garden forms a considerable part of the description. And in that description what beauty is most lauded? Why, exactly that which was the admiration of this England of ours about 150 years since—box trees cut into various shapes, monsters, animals, letters and the name of master and artificer. Thus we see that in an age when architecture displayed its grandeur, when arose Vespasian's Amphitheatre, the Temple of Peace, Trajan's Forum, Domitian's Baths and Adrian's Villa, the ruins and vestiges of which still excite our astonishment, a Roman consul, a polished emperor's friend and a man of taste and literary attainments, delighted in what the English parvenu of to-day would scarcely deign to give a second glance at. All the circumstances of Pliny's summer garden correspond exactly with those formerly laid out on Dutch principles. He talks of slopes, terraces, a wilderness, shrubs methodically trimmed, a marble basin, pipes spouting water, a cascade falling into the basin, bay trees alternately planted with planes and a straight walk from whence issued others, parted off by hedges of box and apple trees, with busts and obelisks placed between them. There wants nothing but the fringe of a parterre to make a garden of the time of Trajan serve for a description of one in the reign of our third William.

Patina.

One of the most valued properties of fine bronze is that it should in process of time, by natural oxidation, become encrusted with a semi-crystalline varnish-like coating of beautiful tones of colours, which vary greatly in different specimens, according to the composition of the alloy and the conditions under which the surface of the metal has been exposed. Now, time, and time only, will induce the beautiful natural "patinas." They can, it is true, to a certain extent be simulated by artificial means, but the fine, natural encrustations have a peculiar texture, a lustre and depth of tone—in short, an æsthetic charm indescribable, which defies imitation. The artificial patinas are produced by the application of acids, by heat, and by surface lacquers and varnishes. It is, of course, very difficult for the uninitiated observer to discriminate betwixt the two kinds—in other words, betwixt the true and the false—and there is a further element of difficulty in the fact that artificial patinas were in use in former times as well as at present; but the great Italian bronzists were aware that any elaborately-concocted artificial patinas applied to their works, especially if in the nature of resinous lacquers, would interfere with the ultimate natural oxidation of the surface, and they evidently contented themselves at the time with the simplest possible colouration of the bright metal by the mere application of acidulous solutions. Sometimes, however, in the chances and changes of the centuries, it has happened that genuine ancient medals have fallen into the hands of tasteless or ignorant persons, who have cleaned and scrubbed them up, and the mischief has been afterwards remedied or concealed by the application of an artificial patina. Such examples are, of course, much deteriorated in value. As a rule, the fine original fifteenth and sixteenth-century specimens should have bright, lustrous and transparent natural patinas, varying in colour from a glowing golden tint through every shade of onyxlike brown to the darkest olive. For the most part the ancient surmoulages of Italian medals—that is to say, the copies produced in Italy during the sixteenth, seventeenth and eighteenth centuries—have had artificial patinas, usually resinous lacquers, applied at the period of their production, the intention being, of course, to simulate the aspect of the original types, which had already become patinated by time. But these spurious patinas have interfered with the natural oxidation of the medals, and the result is usually the formation of a heavy, loaded encrustation, black in colour, and of a patchy, irregular surface. The forgeries of Italian medals which are being produced at the present moment, on the other hand, are as a rule brighter in aspect, for the skilfully-imitated patinas have naturally as yet undergone no change. The best of these are likely to prove a more dangerous snare to the inexperienced collector than the ancient copies, inasmuch as these are in many cases, moreover, moulded from very fine original examples, and so are only one remove smaller in size. Constant observation and comparison of specimens will, of course, alone enable the medal-collector to steer clear of these impostures, and there will perhaps always be cases in which even the most skilful and experienced connoisseurs may be in doubt.

Greek Terra-cottas.

The majority of Greek terra-cottas are small figures in the round, varying in height from 4 inches to 12 inches. Occasionally they exceed these dimensions. These figures exhibit a variety of male and female types, some of which may be at once recognised as mythical personages, while to the majority no name can be assigned; many are probably mere studies taken from real life. They were generally cast in moulds, and afterwards retouched by the hand. Occasionally specimens occur which appear to have been modelled. Originally these figures were all painted in tempera, and some few still preserve their original colours. Many of these terra-cottas were doubtless votive offerings, and must be considered as separate figures; others formed part of larger compositions. In some cases these figures were attached to the surface of vases, when they were called emblemata. Compositions in relief are rarely met with. Such terra-cottas are found in every part of the Hellenic world, but especially in the tombs of Magna Græcia, which have yielded an immense variety of small figures. They have also been obtained by excavations in ancient cities, and especially within the precincts of temples. These figures are not to be regarded as elaborate works of art. They are modelled with great freedom and sometimes a little carelessly; but in the attitudes, and in the composition of the drapery, they show a felicity and boldness of invention which is well worthy of the attention of the modern artist. Many of them seem like sketches in clay, taken from life, or studies and recollections of the works of great sculptors. When we consider that they were probably in most cases the cheap and common product of the mere modeller (horoplatos), we see how generally a knowledge of art must have been diffused among the Hellenic people. The British Museum contains a very fine collection of figures of this class, chiefly from Rhodes, Athens, the Cyrenaica and Magna Græcia.

Normandy Churches.

The great churches of Normandy, like those of England, are commonly finished with the central tower. Perhaps they do not always make it a feature of quite the same importance which it assumes in England, but it gives them a marked character, as distinguished from the great churches of the rest of France. Elsewhere, the central tower, not uncommon in churches of the second and third rank, is altogether unknown among cathedrals and other great minsters of days later than Romanesque. It is as much the rule for a French cathedral to have no central tower as it is for an English or Norman cathedral to have one. The result is that, just as in our English churches, the enormous height of Amiens and Beauvais cannot be reached. But in its stead, the English and Norman churches attained a certain justness of proportion and variety of outline, which the other type does not admit. No church in Normandy except St. Ouen's, attains any remarkable height, and even St. Ouen's is far surpassed by many other French churches. But perhaps a vain desire to rival the vast height of their neighbours sometimes set the Norman builders to attempt something of comparative height by stinting their churches in the article of breadth. This peculiarity may be seen to an almost painful extent at Evreux.

NOTES AND COMMENTS.

IN the last number of *La Construction Moderne*, Mr. LAWRENCE HARVEY describes the College of Masons which he has been instrumental in forming. The members consist of men who have gained diplomas after attending Mr. HARVEY'S courses of lectures on stereotomy. In that way a skilled body of stonecutters can be organised, who will be able to deal with the most difficult problems of masonry. To insure that the members will possess qualities of other kinds, it is intended to seek for certificates from contractors, which will testify as to the conduct of members while employed on works. It appears that several stonecutters have agreed to abide by the regulations, in order to provide that the College will become a guild of competent craftsmen, fit successors of the men who have covered Europe with marvels of construction. Many years have passed away since English workmen were inspired by so worthy an ambition, and it will be lamentable if the revival is not fostered with care. The College is one of the most satisfactory results of the great work undertaken by the City and Guilds of London, and it deserves close attention. But, unfortunately, there is a risk that the members may lose caste among their fellows, who are in favour of the uneducational system of the trades unions. It will, therefore, be almost cowardice to allow the College to fail for want of a little sympathy from those who should take a pride in its success.

THE Guardians of the Hastings Union continue to be the most merry of local authorities, and happily the topics afforded by the scheme for the improvement or rebuilding of the workhouse are not likely to be exhausted during the present century. At present enjoyment is afforded by two subjects. First, is a proposal of the Guardians for dispensing with an adequate workhouse, which the Local Government Board considered as seriously offered, and declined to approve. The error of the Whitehall Board gave so much amusement when it was announced, that it was proposed to send three favoured members to London and interview the Local Government Board as a sort of treat during the approaching festive season. The Chairman said he could not discover why a deputation should be despatched, and he was told the object was to wish the people in Whitehall a merry Christmas. If the whole of the Guardians were to be sent on the errand, we suppose the trip would be welcomed. The second subject is the architect's bill. He has offered to reduce it by 800*l.* A proposal to pay the balance owing—the sums received amount to 1,400*l.*—was set aside by a majority of five. It was then proposed to pay another 1,000*l.* on account; that also was rejected. A third proposal was to reduce the bill by 1,000*l.* instead of 800*l.*, to draw a cheque for 3,137*l.*, and thus put an end to the affair. But by one vote it was also lost. Another course of oratory will have yet to be gone through before a settlement is arranged, and probably it is thought wise to provide an entertainment for winter.

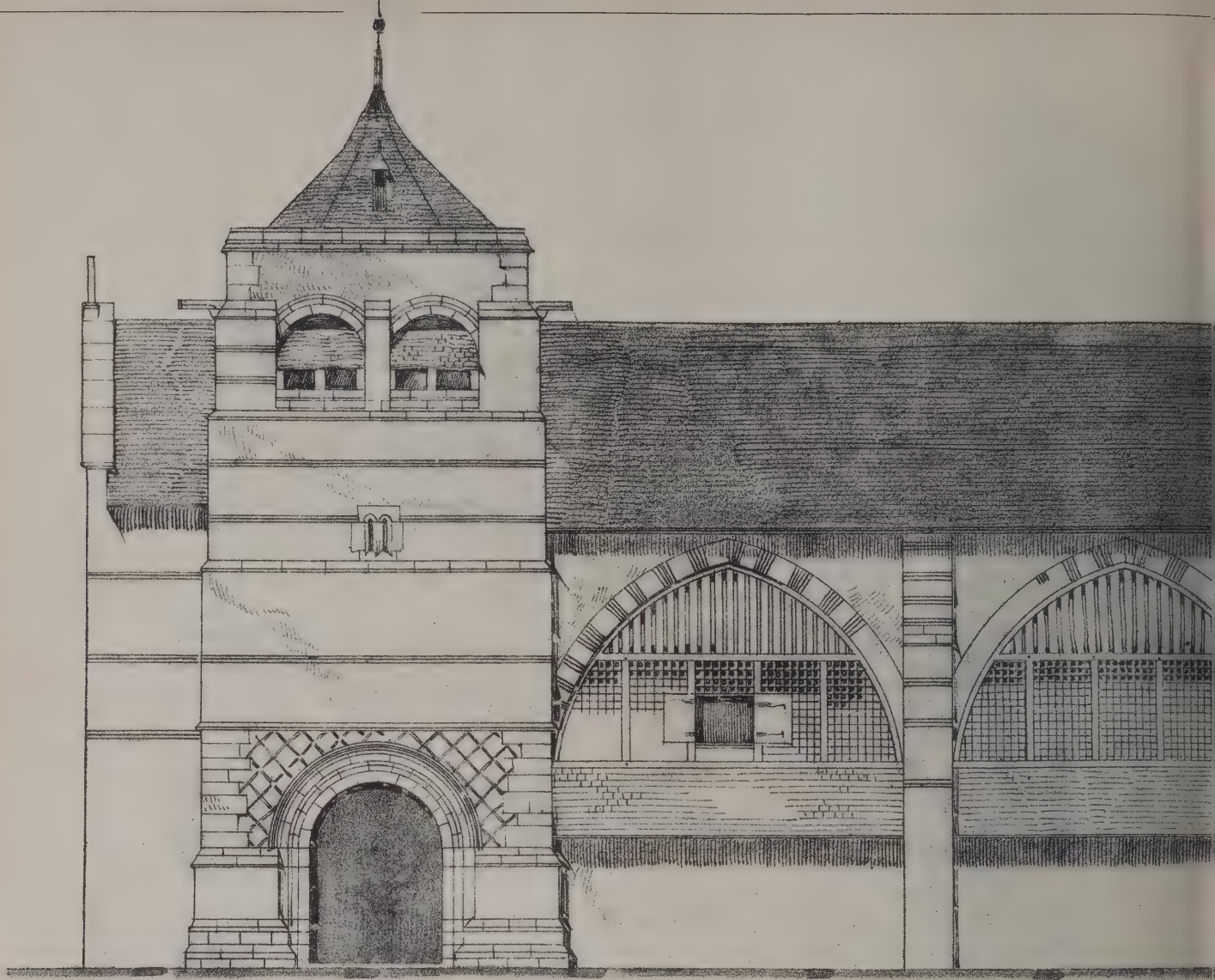
"MACBETH" has a fascination for foreign managers. Everyone knows that SCHILLER prepared a translation of the tragedy for the Weimar Hoftheater, introducing many lines of his own in order to conciliate the audience, who were slow in their mental action. DUCIS made a version for the Paris stage, which, however, was not intended to be compared with the original. There is a less wonderful but more faithful attempt by LETOURNEUR. About half a century ago a M. EMILE DESCHAMPS appeared, who announced that "le fanatism pur de SHAKESPEARE était dans l'air," and he could not escape from it. But he discovered that "Macbeth" was not free from voids, and accordingly he set about filling them. Even Frenchmen were able to perceive that an abundance of rubbish was shot into the voids in order to bring SHAKESPEARE up to a Parisian nineteenth-century level. Of late years M. PAUL LACROIX is accepted as the most French of translators, which means of course that "Macbeth" is transformed. His play was performed at the Odéon in 1863, with the success which nowadays awaits Shakespearean drama among students of the Quartier-Latin. It was repeated in 1885, and the tragedy is about to be again brought out on the same stage, but there is uncertainty about the "book" that will be used. The Parisians have witnessed so many adaptations, it might be well for once to try the effects of an accurate translation. At the Porte Saint-Martin "Macbeth" was also performed, but the characters were made subservient to the Lady Macbeth of Madame SARAH BERNHARDT. It was to "Macbeth" that in the last century the Abbé LE BLANC pointed to prove how skilfully SHAKESPEARE had depicted the natural impression which virtue makes on all, for the "scélérat" was scared at the thought that DUNCAN "hath been clear in his great office," and all human and divine powers were properly united "pour venger la mort d'un roi si débonnaire." Had he a prophetic vision of the revolutionary scenes that were to be acted before the century was over? But there is not much terror in the tragedy when seen on the French stage, for the witches with wigs of scarlet tow excite unrestrained laughter, and are not to be forgotten when they are off the stage. Still, laughter is better than the hooting which was the guerdon of the unlucky tragedians who first performed "Macbeth" after the Restoration. It might have been supposed that WELLINGTON and the more obnoxious Sir HUDSON LOWE were among the supernumeraries. When MACREADY tried the experiment a few years later he overcame all prejudice, and JULES JANIN admitted that, as Macbeth, the English player was as impressive as the great TALMA.

FOR some weeks past there has been correspondence in the Cardiff papers concerning a competition for a local school. The latest phase of the affair is rather remarkable. Mr. ROBERT WILLIAMS, of the Adelphi, was informed that his plans were about to be returned to him. The report of the assessors, of which a copy was sent to him was as follows:—"The number of competitors was seven, each supplying four sets of drawings, and after the most careful and searching examination as to the one most adapted for the purpose of this school, showing the most suitable and economical arrangement, having regard to the requirements of the Secretary of State, we have come to the decision that the best is No. 6, which is that of Mr. W. H. DASHWOOD CAPLE, of 1 St. John's Square, Cardiff. We also assert that even this plan is not free from defects, and urge that, if adopted, it should be considered subject to alteration." When his drawings arrived Mr. WILLIAMS discovered that the serial number on the drawing containing the plans and elevations, which appeared originally to be 6, had been tampered with, partly scratched out and Chinese white applied to it. The figure was then altered into a 2 and again into a 7. It is not unreasonable for Mr. WILLIAMS to imagine that his plans were those which as No. 6 gained the recommendation of the assessors. He proposes to hold the committee responsible for the detention of his drawings, and also to lay the correspondence and photographs of his drawings before the Home Secretary. It is evident some one has blundered in South Wales, and, that being the case, some more light should be thrown on the case.

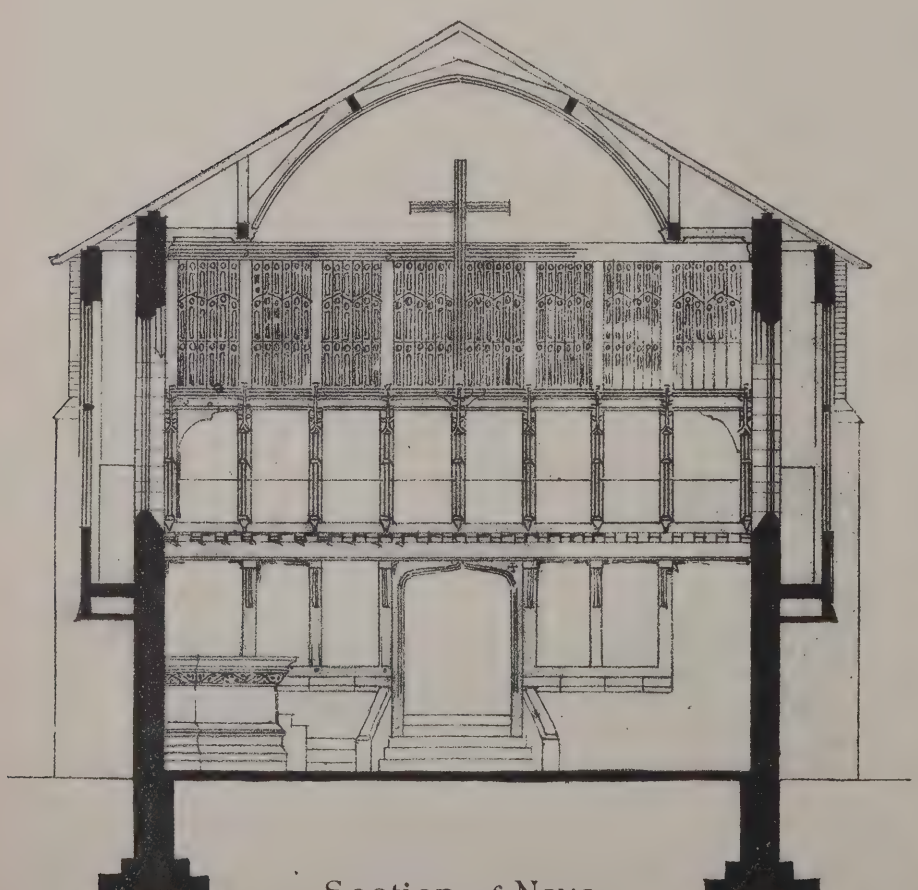
THE death of M. ALPHAND will be likely to cause many changes in the Works Department of the Paris Municipal Council. The permanent staff is not large, and much of the work is done by outsiders. Many engineers and architects in Paris rely mainly on the occasional engagements which they receive from the Hôtel de Ville. The sums received are not extravagant for the services which are rendered. But there are councillors who cannot imagine the modest way in which members of the two professions live in Paris. They believe that money is laid out on temporary service which would be more than sufficient to provide for a large and capable staff throughout the year. If the contemplated changes are carried out they will no doubt affect the system of professional education. Winners of certain prizes expect employment under Government or municipalities, and if the Paris Council should adopt the plan of promotion "par les degrés de l'ancienneté," it may be assumed that other public bodies would imitate the example. It seems strange to many of the councillors that some of the members of the permanent staff should receive for a year's work smaller sums than are paid to temporary assistants for a fraction of a year, and as there is discontent among the staff, it is no wonder a reorganisation is demanded.



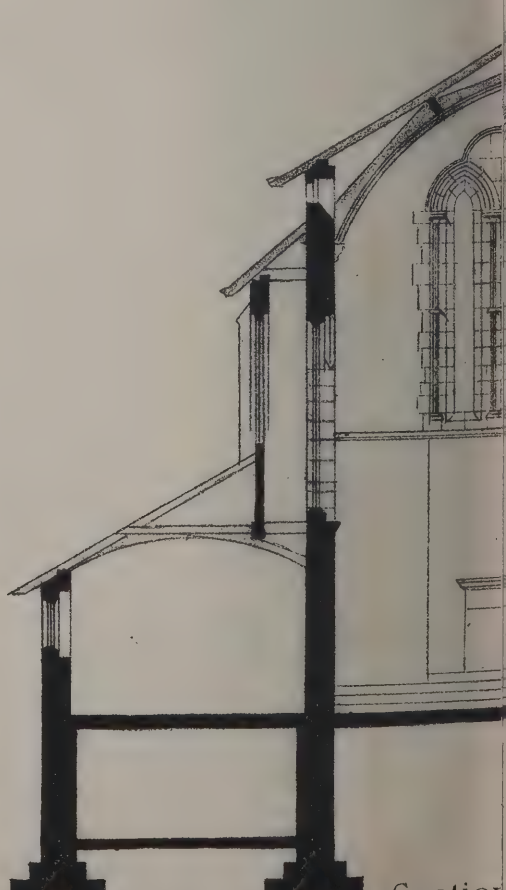
House at Eastbourne for Dr. Arthur Oakes.



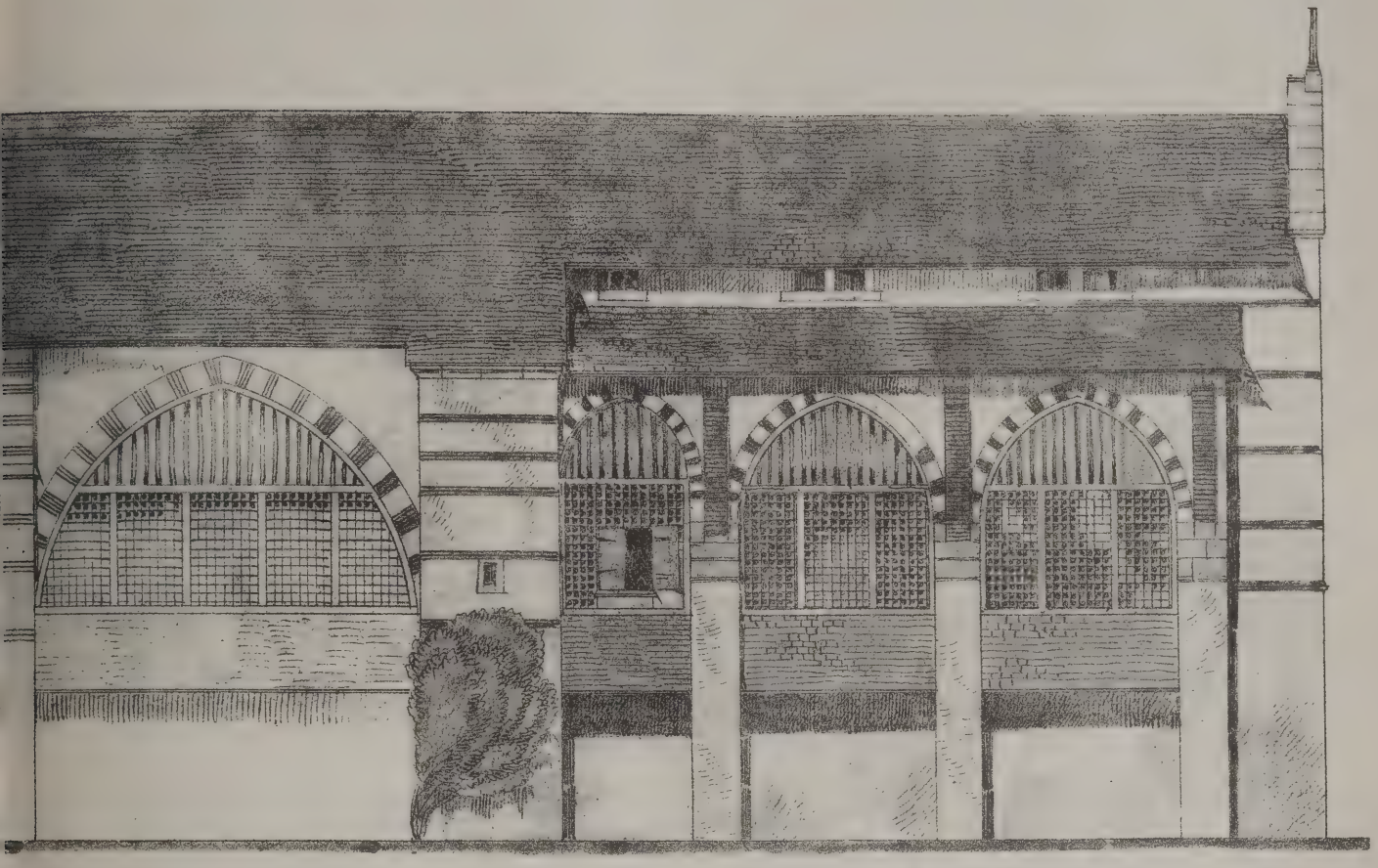
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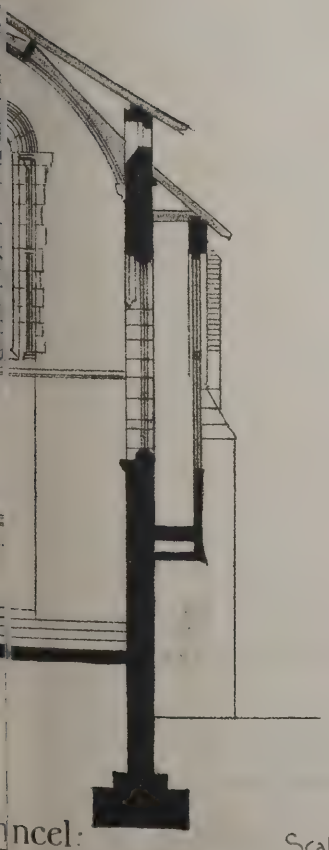
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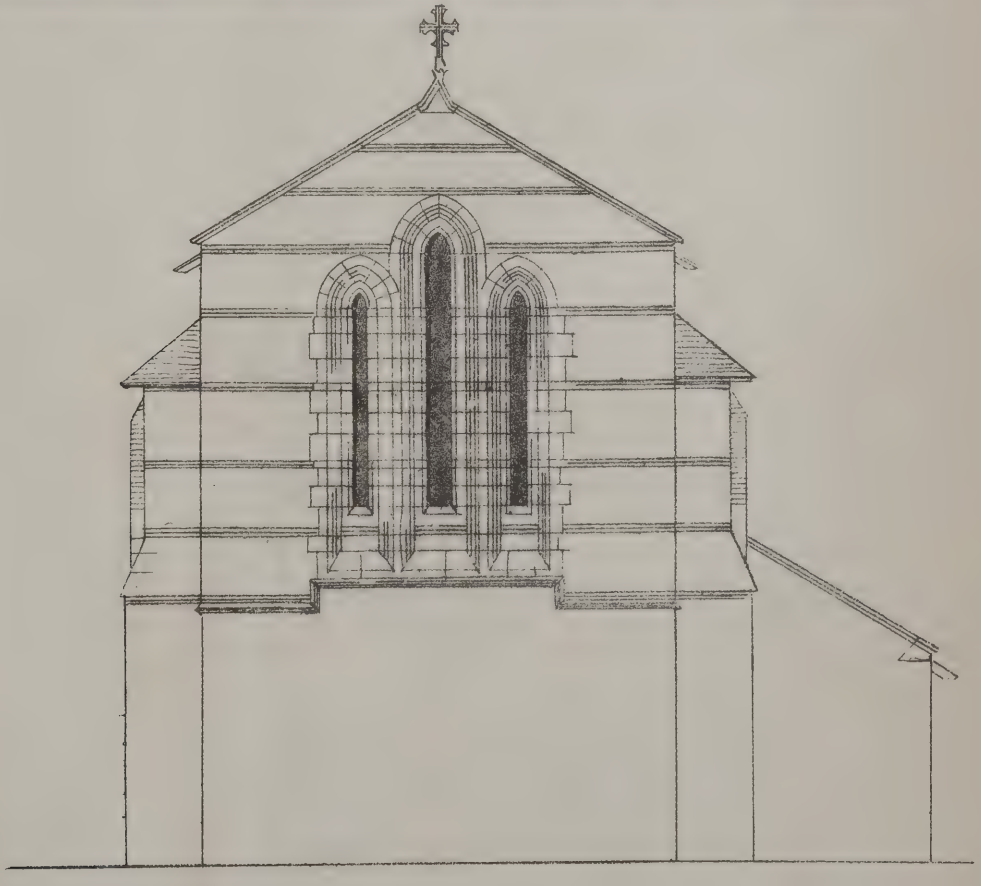


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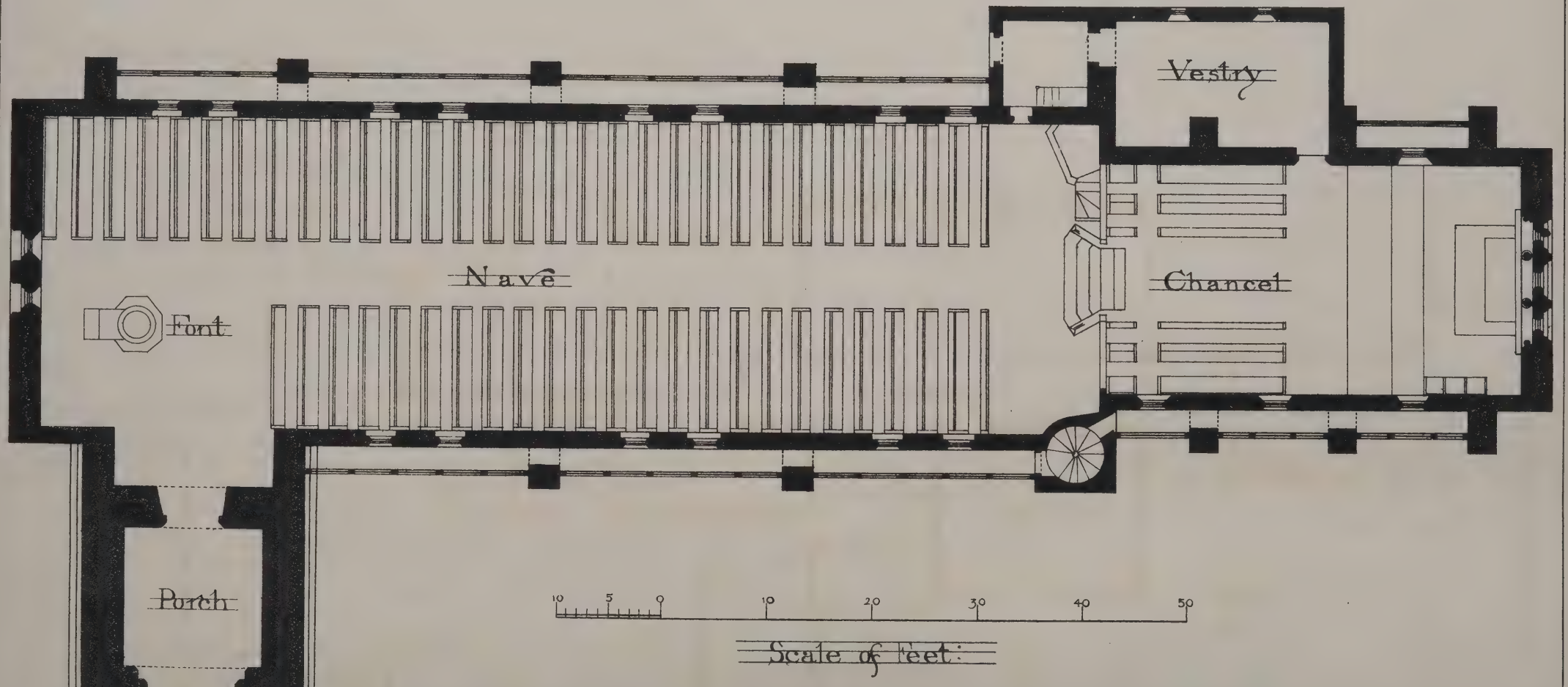
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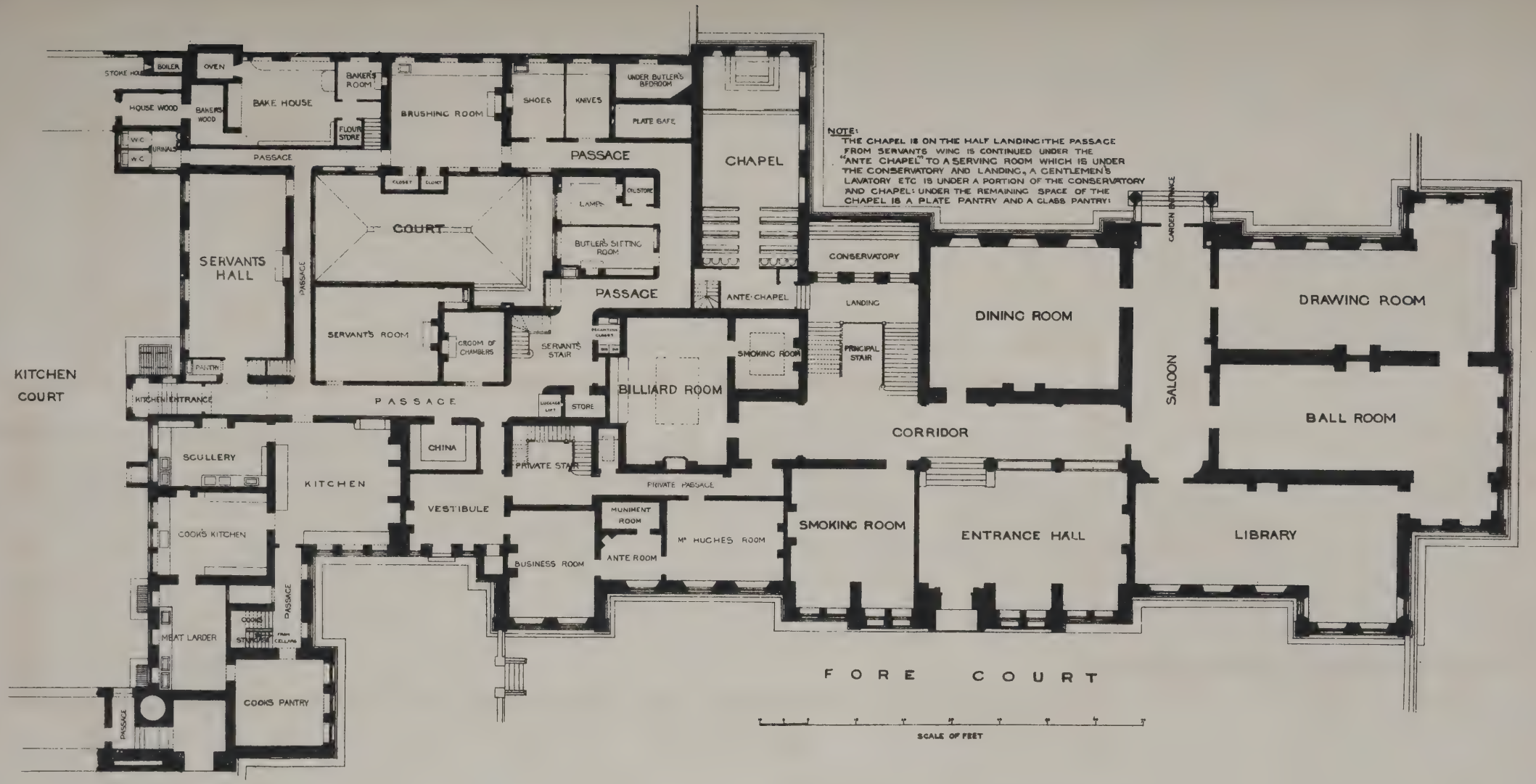
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NEW CHURCH, PORT ELIZABETH, SOUTH AFRICA.
PLAN.
R. NORMAN SHAW, R.A., Architect.

Printed by Sprague & Co. 4 & 5, East Harding Street, Fetter Lane, E.C.

The Architect, Dec. 11th 1891.



The Architect, Dec. 11th 1891.

KINMEL PARK, ABERGELE.—GROUND PLAN.

THE SEAT OF H. R. HUGHES, ESQ.

The late W. EDEN NESFIELD, Architect.

Printed by Sprague & Co. 4 & 5, East Harding Street, Fetter Lane E.C.



HOUSE AT EASTBOURNE FOR DR. ARTHUR OAKES.
THE DRAWING ROOM

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NOS. 442, 444.—NEW CHURCH, PORT ELIZABETH. [R. NORMAN SHAW, R.A.]

NO. 443.—PLAN OF KINMEL PARK, ABERGELE. [W. EDEN NESFIELD.]

HOUSE AT EASTBOURNE. DRAWING-ROOM AND HALL.

For description see page 351, December 4.

SHEFFIELD SOCIETY OF ARCHITECTS.

A MEETING of the Sheffield Society of Architects was held on Tuesday, when a paper on "The Architect and his Artists" was read by Mr. W. H. White. In the course of it the author said :—

Not the least remarkable result of all the researches yet made into the history of ancient and Mediæval buildings is the uncertainty of their origin in respect of design. The great works of old are identified with the names of kings, princes lay and ecclesiastical, bishops and clerks. In Western Europe, during the Mediæval period, the names of artists engaged in different occupations upon cathedrals and other buildings have come down to us, but the architect as we understand him is conspicuously absent or non-existent. An attempt to explain this away was made by Mazois, who maintained that among the Romans it was a deeply-rooted custom never to put the name of the architect upon a monumental building; in support of which he referred to Pliny (xxxvi. 12), who attributed magnanimity to Ptolemy because that ruler permitted the architect of the Lighthouse of Alexandria to inscribe his own name upon the structure. There have, however, existed such offices as architectus and ingeniator, or ingenarius (corrupted to engineer), supervisor (corrupted to surveyor), magister operum, and clericus operationum, devizor, master-mason, and other denominations pertaining to persons having charge of the execution of such buildings; and there are records of men in the fourteenth and fifteenth centuries who were imported from one country to another to reconstruct or superintend the reconstruction of cathedrals and other works of the kind, the largest amount of evidence under this head having been obtained by the late Mr. Street from the Chapter Archives extant in Spain. But who or what the men were who, in the twelfth and thirteenth centuries, inspired the design of structures absolutely identical in arrangement and methods of construction, though situated at remote distances from each other, in different countries and among different peoples, is still matter of inquiry and surmise. From whatever centre the design may have come, it was worked out as local circumstances permitted, and the works were directed by men trained on similar lines according to a recognised standard. That these superintendents spent most of their time on the buildings themselves as they were rising is almost certain; and it is absolutely certain that such buildings were not executed under a general contract, or by the personage now called a general contractor. The difference between the educational and social attainments of the artist or workman, and those of the master who directed him, was infinitely less than exists at the present day between the artisan or artificer and the architect.

It may be interesting to quote a letter written to me in December 1874 by the late Sir Gilbert Scott :—"If," said he, "in the Middle Ages, in the countries on this side of the Alps, workmen, clerks of the works, builders, masons and architects were jumbled together, it followed that the study of architecture was followed up by all of them. If at the same and somewhat later times, on the other side of the Alps, the jumble was rather between architects, sculptors, painters and workers in mosaic, it equally follows that all of these classes studied architecture. We know this by the results, which speak for themselves." His contention obviously is that in the great periods of architectonic progress the artist or workman who aspired to take part in the execution of a great building had to learn architecture, which thus not only theoretically included within itself the attendant arts of painting and sculpture, but used them both to explain the purposes for which a building was erected—in other words, as voices to tell its story to the population of the time and to posterity. Recent dogmas of individualism or specialism must be dismissed from minds desirous of understanding how some of the old buildings most venerated at the present day were designed and carried out. If in the minor arts it was the system of pupilage which produced results that are now admired, and foolishly thought to be unsurpassable, it was not the same divided system as that now in vogue. It was not the grouping of pupils around a specialist to study theoretically the specialty he practises, but the study by all young artists of the one grand art, architecture, on the buildings themselves, in daily converse with the executants, under the eye of the master or his elder disciples—a system of which only a rudiment remains in England, but which still exists in France, though in a modified and restricted form.

France, moreover, has preserved the custom of continuity among the craftsmen composing the various building arts or trades, and thus to some extent insured herself against such strikes as we now witness in England. The *apprenti* and the *compagnon*, if he have wit and courage enough, can rise, and does rise as a natural sequence, to be a master, and enter into contracts with employers for the execution of works in his particular trade. No such possibility is open in this country to the workman in any of the ordinary building arts; here he is the dependent, hopelessly bereft of the emulation necessary to all progress, of the capitalist master, whose only necessary qualifications for the position he holds are business aptitudes and a certain power of organisation. The capitalist is the acknowledged master of mason, bricklayer, carpenter, smith, slater, plasterer and every other worker in the building trade, without having served an apprenticeship to any one of them, and without of necessity being acquainted with even the remotest detail of building-construction. His dependents—the workmen whom he employs—treat him, not as a master from whom to learn and improve on their work, but as a sweater of whom it is quite fair to take advantage whenever possible. The only palliation of the system of general contract, as we now have it in England, is that the capitalist contractor shall have been educated as an architect, and there are a few instances in which this already occurs. In fact, the late Edward Barry, R.A., once told me that in his opinion an architect with capital could not do better than become a general contractor, and execute as well as design any buildings entrusted to him. As it is many contractors employ architects and draughtsmen in their offices, to the detriment of the architectural profession, and there is every prospect, in my opinion, of a serious development of the practice. Under actual circumstances in England the power and universality of the architect are so diminished by the regular presence on every building of the capitalist master, who follows the course of the work, while the architect is represented there only by his drawings and a half-educated clerk of the works, that I doubt much whether the trouble saved to the architect by the employment of a general contractor compensates him for the loss of influence he suffers therefrom in the direction of the several crafts or trades. In Paris and France generally the architect is the sole and supreme master of the work, and his relations with the master-workmen are constant and direct. He makes his contracts not with one capitalist, but with a dozen master-tradesmen, who each work under his direction, and who look to him only for orders to fix materials and assist each other at the several stages of the work. This fact renders it essential for an architect in France to be a constant visitor on the works with the superintendence of which he is entrusted; and I have known architects who, if their buildings were in Paris, visited them daily, and, if at a moderate distance from the capital, twice or three times a week. The visit of a French architect to a building in course of erection under his orders is a most characteristic ceremony, and not confined to the largest works. He is followed throughout by the masters of each trade engaged, by his assistant-architect, who probably lives at the works, and by the principal foremen. The consequence of this system is that the business of architecture is more equally distributed in France than it is in England: the architect takes less work, and, moreover, makes less out of it, for it costs less in execution. Obviously, there are fewer rich architects in Paris than in London, but I think that the average income of architects in the French capital is larger than it is in the English one. At the same time his honorarium is less, and it is divided as follows :—

	Per cent.
Preparation of the design, specifications and estimates	1½
Conduct of the works	1½
Verification and settling of the accounts	2

Thus it will be seen that the design is authoritatively valued, in a great artistic country like France, at less than a third of the 5 per cent. commission paid to an architect both there and in England; and the Frenchman, in addition, has to pay his own surveyor or *vérificateur* for checking the measurements made by the contractor's *métreur*, whose recognised charge is 1 to 1½ per cent., which last charge is included in the contractor's accounts. I have often thought that if the British public were only as shrewd as foreigners think they are, they would pay the "artist"—the new architect of whom we have heard—2 per cent. for his work, instead of the 5 which he remorseless exacts; and possibly then there would be less said about the art, to the exclusion of the science and business, of architecture than there is at present.

That the general contractor can be dispensed with in certain cases, one has only to examine the Hôtel Métropole at

Brighton, and other buildings of like importance in London; and that he may one day be dispensed with altogether I fervently hope, not only for the sake of the architect, and the artists whom it ought to be the latter's function to direct, but also for the arts which, from the highest to the lowest, in every ancient monument extant admit their allegiance to architecture. There is danger, of course, in any reversion to the old custom of an architect, as the agent of his employer, purchasing materials and employing labour. Thereby the abuses, against which Professor Donaldson and others contended, and to destroy which they founded the Royal Institute of British Architects, might be revived.

I believe it has been established beyond doubt that the Mediæval guilds in their corporate capacity did not teach; they merely examined. The technical education of those days was an affair of master and apprentice. Membership of a guild or corporation implied that apprenticeship had been served for what would now be called a long period, and an examination satisfactorily passed. The member or master entered into certain obligations and submitted to certain rules of discipline, which were alike an honour to him and a protection to the public. He was allowed to take a certain number of pupils, who in due course became masters and members of the guild; and this went on from generation to generation. But these customs, which in the sixteenth century were doubtless thought old-fashioned, were largely interfered with by the extraordinary influx of foreign workmen from Italy and France, attracted by the wealth (comparatively regarded) of this country and its desire for improvement in the arts. It was only after the disintegration of the guilds, and prior to the foundation of academies, that a selected few were dubbed, by the personal favour of monarchs and reigning dukes, ducal engineers, ducal painters, architects and sculptors of the king, and permitted to use other high-sounding titles of a like kind. It was such men who in Paris, in the time of Louis XIV., formed the Academy of Painters and Sculptors and the Academy of Architecture, both of which merged into the Academy of Fine Arts and were resuscitated as part of the Institut de France by Louis XVIII. in 1816.

The main principle of the Mediæval guild was the consolidation of all workers in a particular art or mystery (which means *mestier*, or trade) as a corporate body, and these professed practitioners enjoyed equality among themselves. The main principle of the Academy, as it has come down to us from Italy through France, is the selection of a few who by personal favour are placed above their fellows in the same art, and who, as members of the Academy, are absolutely free from all professional discipline whatever. The Mediæval principle reflected a spirit of true equality; the modern academic spirit is of the very opposite description and totally opposed to the great doctrine of modern legislation which in this country is peculiar to no one political party—the security of the greatest happiness of the greatest number.

The influence of an academy, especially when subventioned by the State, is always largely enhanced by the fact that it is situated in the capital city, imperial, royal or republican, as the case may be, and as all such centres possess an extraordinary attraction for the youth of a country, as success in the provinces is always burning to repeat itself in the metropolis, great capitals swell every year in dimensions. A lifelong struggle for work is deemed preferable by a great mass of Englishmen to a modest practice in a provincial city, principally because the best men of a nation are supposed to collect in its metropolitan centre, and if this superstition hold good generally, the elect of the best men, the chosen few, say, of a great profession, must hold a position not less advantageous to their own interests than prejudicial to those of their brethren in the same capital. It follows, therefore, that that position must be still more prejudicial to the interests of the whole body of the profession throughout the entire kingdom. Indeed, I shall divulge no secret if I venture to state my belief that London, which grows larger every day, is not behind other imperial capitals in its willingness to do the whole work of the empire. London, in fact, is equally prepared to do the work of a large part of the whole world if the world will only let it; and I am quite sure, as far as architecture goes, that London is prepared to design and erect buildings all over these islands and far beyond the limits of these shores, even though the architects resident in the respective localities affected may raise a sentimental objection.

It will be admitted, I think, by men of the world that there are excellent reasons for preferring the principle of the Mediæval guild to that of the modern academy. The political prosperity of a State is not to be measured by the existence of a despotic monarch, with a few highly-placed nobles and a disorganised population of ignorant and uncultivated subjects; the wealth of a State is not to be measured by the existence of a few millionaires in the midst of a population of poor and needy persons. The French architect-academicians design and personally superintend the execution of public buildings, or they hold the post of inspectors-general of national monuments or diocesan edifices, or State schools or prisons, &c., but they seldom accept private practice, and their annual incomes are often less than those of the ordinary practitioner. So recognised, however, is their position that the post of President of the Central Society of the Architects of France is allowed to be held only by one of the eight architect-academicians, and no member of the Society, except he be of the Academy, can rise higher than vice-president. Yet no one grudges the Academicians their well-earned distinctions, and no one fails to pay them the respectful homage which is their due. Very different is the position of an architect member of the Royal Academy in London. There is no need for him to earn by any special training the honour of election; there is no standard of excellence, scientific or artistic, except perhaps the fashion of the decade and the personal esteem of those in power, to which he need conform, and his chief obligation is to exhibit sketches of his works in the Academy Architectural Room.

The danger of playing to the public in general, in exhibitions of architectural sketches, is seen in the observations made by highly-placed critics—by men of science such as Professor Huxley, whom nothing will ever convince that architecture is not an applied art; and here, perhaps, the distinguished scientist may be pardoned for maintaining an opinion which he arrived at many years ago, and which seems to be not opposed to the tenets of an artist so distinguished as Mr. Norman Shaw. Professor Huxley would build a brick shell, and in later years, when enough money could be got, would order an architect to adorn it with a front; and, under such conditions, were architecture only an art, the Professor's advice would be good. The three artists, in perfect unison, would be called in at the right moment to arrange and apply to the shell the lines of the front, which would be architecture; to arrange and apply the ornament, which would be sculpture; and to arrange and apply the colour generally, and the subjects to be depicted in particular, which would be painting. That would be a perfectly feasible consummation, if the employment of an engineer to construct the building which the front is intended to hide be accepted, and if a surveyor be entrusted with the business part of the transaction. But there is a higher and better way to attain unity in art. The young men who aspire to be sculptors and painters, no matter in what category of those two arts, should commence their career by studying architecture, theoretically, and afterwards for a short period of probation, practically. Nor is it improbable, as education advances, that such a course may be adopted in the training of painters and sculptors, more especially if, as seems also likely, a return to the proper employment of those two artists on national and municipal buildings be rendered possible; and it must be owned that the country would lose little by an enforced dearth, however protracted, of easel pictures and pedestal statues of the type now common.

It will doubtless be admitted that when a youth chooses, as it is called, a profession, he takes a leap more or less in the dark; and if one who has jumped into the crowd of painters or into the crowd of sculptors finds out, as day breaks, that he has made a mistake, it is difficult for him to acknowledge the error. Though he hopes to mend his position, he has learnt the rudiments of painting only, or of sculpture only; but if he had studied the rudiments of architecture, the choice not only of that art, but also of its endless subdivisions, would have been open to him. At the worst, if he ultimately decided to relinquish the pursuit of it or any subdivision of it, the time he had devoted to its study would not be lost to him, no matter what calling he might choose for a career. All hope, however, of making the study of architecture the basis of art education must be given up if it is to be treated as a specialty, or as an art only in the modern æsthetic sense of the term.

What is that art? What, in fine, is "architectural art" in its modern æsthetic sense? Let us test it by the experience of the present happy reign of Queen Victoria, for even those who are but approaching their half-century can offer a reply to this crucial question. When, about a generation ago, they were beginning their professional lives, there existed among British architects a supreme, an irrepressible contempt for the artistic character of the works executed by their fathers and grandfathers; and at the present time I encounter everywhere signs of doubt and disappointment respecting the artistic merits of works designed and executed less than fifteen and thirty years ago—during a period, in fact, when artists have been more or less confident that the right thing was being achieved. What is the obvious inference?

It was a pretty poetical idea of the ancients to represent the Temple of Nemesis as always open during a triumph, and the new architect, in the present hour of his newest success, may even now perhaps be haunted with the warning words poured into his ear by some miserable cynic: as your fathers and grandfathers despised the works of their predecessors, as you contemn the works of your fathers and grandfathers, so will your works be treated by the sons and grandsons who outlive you. The short experience of half a century suffices to show that the architectural art which a comparatively recent

generation believed to be good, the succeeding generation believed to be bad; and architectural art of the modern type applied to a building seems to be neither tangible nor capable of progressive development. Scientifically and artistically-constructed buildings are what the educated public want, and if they are sometimes hard upon an architect it is because of his bad building, not of his bad art. I am sorry thus to dissociate building from art, and can only offer in excuse the present pernicious application of the ancient word "art" to something ethereal in the domain of architecture. With the followers of Mr. Norman Shaw art appears to be a sentiment, a feeling or a fancy, derivable from a fund of æstheticism in their leader's possession; and the leader is apparently unconscious that the promissory notes now drawn upon it may be dishonoured at the first radical change of fashion or the next reversal, in the lifetime of half a generation, of every artistic principle that the preceding half held to be true and irrefutable.

A discussion took place, in which the President, the Vice-president, Mr. E. M. Gibbs, Mr. C. Hadfield, hon. sec., Mr. J. B. Mitchell-Withers, Mr. J. Smith and others took part, and a vote of thanks was given to the lecturer.

ROYAL SCOTTISH ACADEMY EXHIBITION.

AMONG the works by noted English artists which will be included in the exhibition of the Royal Scottish Academy this year, there will be two examples of Mr. Alma-Tadema's art, and a representative work by Sir John Millais. But the Council, who have been engaged receiving and selecting the works sent in—a much larger number, by the way, than usual—are satisfied that the feature of the exhibition will unquestionably be a loan collection of the works of the late Sir William Fettes Douglas. Private individuals when approached have readily consented to lend the Academy any example of the late President's work they possessed, and the result is that a splendid collection has been got together, numbering about thirty oil-paintings and a score of water-colours, some of them painted thirty years ago. Of recent years the public have had practically no opportunities of seeing the works of the late President, and this collection, it is believed, will be to many in the nature of a revelation, and will give a proper indication of his distinguished merits as an artist.

THE GLASGOW ART GALLERY AND MUSEUM.

AT the meeting of the Glasgow Town Council on the 3rd inst., the Lord Provost said:—It has been suggested to me that I should to-day give some information regarding the present position of our association for the erection of fine art galleries, concert hall, museum and school of art in Kelvingrove Park, in which, as you are aware, I am taking a very earnest interest. Having been appointed convener of the Indian Section of the International Exhibition, I did my best, while in India in 1886 and 1887, to obtain suitable exhibits, and on my return co-operated with Sir James King, Bailie Dickson, Bailie Shearer and others, in helping forward the exhibition by every means in my power. When the accounts were closed, we had a surplus of 46,000*l.* available for the erection and equipment of an art gallery and museum, but that amount was manifestly inadequate for the erection, much less the equipment, of an art gallery and museum suitable for Glasgow. Numerous meetings and consultations were held by those interested as to where the buildings should be erected and how the additional funds should be raised, and many proposals and schemes were put forward and carefully considered. At an early stage it appeared to me, for many reasons, that a portion of the site occupied by our International Exhibition in the Kelvingrove Park was the best that could be chosen, and, provided that site was agreed to, I offered to give a substantial subscription to help forward the movement. Finally, it was arranged between the executive of the exhibition and the Parks and Galleries Trust that if the association raised a further sum of 46,000*l.*, the Corporation would grant a free site in Kelvingrove Park. An executive committee was appointed to carry out the work, composed of eighteen members—twelve nominated by the Town Council and six by the Association—and it was arranged that the buildings when completed should become the property of the Corporation. On this understanding I very willingly subscribed 15,000*l.* Other citizens have contributed very liberally, and we are now able to report that a sum of 55,000*l.* has been raised by voluntary subscription from a comparatively small number of citizens. The surplus from the exhibition was originally 46,000*l.*; interest accrued has increased this to 48,000*l.* Thus we have already 103,000*l.* available. Arrangements have been made to appeal immediately to the whole community. Many members of the Town Council have contributed nobly. Some of those who have recently joined from the new wards may not have had the scheme so fully placed before them as I have now done. We propose very soon to print a list of the subscriptions, and I would like to see the names of as many members of the Town Council as possible on that list. Subscriptions are payable in equal instalments over a period of four years, and we will be glad to have any amounts from the smallest to the largest—of course, the larger the better. I will be much gratified if intending subscribers would kindly communicate either with the honorary secretary, Dr. F. L. Robertson, or myself or any other member of the committee. In pushing forward this scheme the services rendered by Dr. Robertson have been invaluable. No man could possibly have done more than he has in obtaining subscriptions and in helping in every department. Sir James King, Bailie Dickson, Sir William Arrol, Mr. Robert Gourlay, Mr. Renny Watson, Mr. Clapperton and others have also taken an enormous amount of trouble in pushing forward the enterprise. We issued about 200 schedules showing a plan of the site, the surface levels, and supplying other information. I understand sixty sets of plans have been sent in, and Dr. F. L. Robertson and Mr. M'Donald, our city engineer, are at present engaged hanging these in the rooms upstairs. Mr. Alfred Waterhouse, R.A., will make a selection of what he considers the six best designs, and the architects whose designs have been thus selected will be invited to take part in the final competition.

DRAINAGE OF TOWN HOUSES.

AT a meeting of the Society of Engineers held at the Town Hall, Westminster, on December 7, Mr. W. N. Colam, president, in the chair, a paper was read by Mr. G. M. Lawford on "The Drainage of Town Houses." After alluding briefly to some of the now well-known defects in the earlier attempts at house drainage, the objects to be attained in carrying out a perfect system of drainage, with special reference to drains passing under houses, were stated to be as follows:—1. The primary disconnection of the house-drain from the main sewer. 2. The thorough ventilation of the entire system. 3. The secondary disconnection of the rain and waste-water pipes from the house-drain. 4. The immediate and absolute removal of all matters discharged into the drain from any source whatever. And lastly, 5. The construction of the entire system in such a manner as to prevent foul gases or currents of polluted air from entering the house, and of such materials as to preclude the possibility of the leakage or escape of both gases and liquids.

The meaning of the terms "disconnection" and "trap" was then explained, and descriptions of the different forms of disconnection were given, showing the usual type of manhole with intercepting trap and air inlet. With regard to the ventilation of drains, attention was drawn to the fact that in order to create and maintain constant circulation an inlet is necessary as well as an outlet, the position of each being so arranged as to produce a current of air throughout the entire system.

The question of trap ventilation and syphonage was gone into, reference being made to the necessity for ventilating the traps on a horizontal tier of appliances, such as a range of lavatories, as well as those on a vertical tier, such as a soil-pipe. The separate trapping of every appliance was also advocated. The treatment of waste-pipes and the different forms of gullies were taken conjointly, the practice of doubly disconnecting the former by means of hopper heads being strongly condemned.

The three essential factors for facilitating the immediate removal of all matters discharged into the drain were stated to be the size and inclination of the latter and the water-supply. Instances were given showing the sizes of drains in relation to the greatest possible volume discharged into them, and the advantages of using 4-inch drains were described and advocated. The utilisation of automatic flushing for the removal of grease in preference to its collection by grease-traps was also considered under this heading.

The water supply and service was touched on briefly, special attention being given to the question of separate cisterns for closets and for domestic purposes, the author maintaining, in spite of the popular belief to the contrary, that, under the special circumstances described in detail, drinking water could be used with safety from a cistern supplying a closet.

The construction of the entire system in such a manner as to prevent foul gases or currents of polluted air from entering the house was described as embodying the various points advocated in the paper, namely, thorough disconnection and ventilation; treatment of waste-pipes as disconnected soil-pipes; separate trapping for every appliance; 4-inch drains combined with automatic flushing and a good supply of water.

The question of the best materials for the prevention or escape of gases and liquids was treated under the three sub-headings of—(1) the underground drains; (2) the rain-water, soil and waste-pipes; and (3) the appliances. Regarding the

first-mentioned, a comparison was given between stoneware and iron, the latter, though undoubtedly more expensive, being given the preference on account of the greater safety obtained by its use, the smaller number of joints required, and the certainty of sound joints between lead soil-pipes and the underground drain. The ordinary painted rain-water pipe was described as a nuisance, owing to the certainty of its choking sooner or later from internal rust; and galvanised pipes were stated to be the best for rain-water, and lead for soil and waste-pipes.

Regarding the appliances, urinals were alluded to briefly, the author considering them out of place in private houses, and advocating intermittent automatic flushing in all cases. The three forms of closet in general use, namely, the valve, wash-down and wash-out, were described in detail, the former being considered best. The principal objection to the two latter when made in one piece of earthenware being the connection with the soil-pipe, but this difficulty was being overcome by the introduction of lead traps specially adapted to pedestal closets.

In concluding, the author drew attention to the necessity for testing all drains by hydrostatic pressure, as being the only test in any way resembling the pressure to which drains were liable when a stoppage occurred.

THE EARTHQUAKE IN JAPAN.

A DETAILED account of the terrible earthquake in Japan on October 28, which affected thirty-one provinces, has been sent to the *Times* by its correspondent in Tokio. As regards the way in which buildings and engineering works resisted the shocks he says:—The effects produced on engineering structures are in many cases extraordinary. One brick railway arch between Nagoya and Gifu collapsed in consequence of its abutments, 14 feet high and 5¼ feet thick, having been thrown apart in opposite directions. The roadway beneath has a transverse crack 4 inches wide. Three great railway bridges within a radius of six miles from Gifu, crossing the rivers Kisogawa, Nagaragawa and Ibagawa, have suffered badly, the massive piers of brickwork or iron having been broken across, though the iron girders, of English make, withstood their terrible treatment wonderfully. All of these bridges were thoroughly good, strong structures, and have been in use for five years without suffering in any degree from such potent destructive agencies as the fierce typhoons and river-floods of Japan. The minor bridges throughout this district have also been wrecked in various ways and degrees. And generally, from its effects on engineering and other structures, the earth-movement on the 28th seems to have been at least as violent and extreme as that of any earthquake in the history of mankind.

It is already recognised that, had such precautions as the building laws proper to earthquake areas been in force, much of the damage might have been averted—not in the central region of disturbance, where the destroying powers were so irresistible, but at least in the outer area, where it is found that destruction has been practically limited to old, rickety, or rotten edifices. Generally, the effects of the earthquake confirm accepted theories in some respects, and in others teach new lessons. Mill-chimneys, for example, were broken across the middle—which was to be expected, their tops being free to sway—just as a carriage whip may be snapped in half by violent back-and-forth jerking. Bridge-columns, on the other hand, being of uniform section and loaded, went, naturally, at the base. The fine old castle of Nagoya is almost unharmed—a fact due, doubtless, to its shape, which is somewhat that of a pyramid in decreasing stages, as well as to the immense strength of its walls, and to the girdle of protection afforded by its deep, wide moat. Many of the more solidly-built temples also showed wonderful powers of resistance. Among the lessons taught by the earthquake is an important one bearing on seismometry. The experience on this occasion, Professor Milne tells me, confirms an idea he has long entertained—that whenever vertical movement takes place it means that oceanlike waves are passing beneath our feet, and that what have to be measured in order to determine this motion are the angular tips of the surface, for which a new class of instruments must be devised. It would have been interesting if means had existed for ascertaining the times of propagation of the great shocks to distant points in the surrounding region. But, for the reason already given, no trustworthy time-records at or near the origin were possible. A curious feature observed at Nagoya is the heaping of the tiles, on some roofs still erect, in waves with their crests lying approximately north and south—that is, in lines perpendicular to the direction of the earthquake-throws. The behaviour of buildings and of the fragments thrown from them also affords an interesting field of research, and gives evidence of extraordinary twisting and rotation. Gradually, full information on these and kindred matters, already being investigated by experts on the spot, will doubtless be given to the world. The opportunity of adding to our knowledge is a rare one, and it is to be hoped that engineers and architects at home will avail themselves of the valuable *data* that will soon be put before them. Not only are some of Great Britain's possessions liable to serious seismic agitation, but English professional aid and English capital are largely employed in engineering concerns in the earthquake-ridden territories of other nations.

Another correspondent of the *Times* says:—In the space of a few seconds the half of beautiful Japan was mapped out into areas of violent and relatively feeble movement. It was a repetition of one of nature's sermons, from which we have learned that at the time of earthquakes soft materials suffer more than those which are relatively solid. Not only have we this broad distinction in the distribution of earth motion, but every given area shows that movements have been anything but uniform in all its parts. A good illustration of this was noticeable in the effects produced along the railway line, which showed that the slightest differences in surface contour had a marked relationship to the destruction which had been produced. Wherever there was a cutting the line remained intact, and it was evident that the motion had been relatively small. To the right and to the left the surface-waves had been discharged upon the faces of the banks, whilst at the bottom of the cutting the motion had been similar to that which we should find a few fathoms beneath the surface of a stormy ocean. Unfortunately the cuttings were few, and the general appearance along the track was as if some giant hand had taken rails and sleepers and rubbed them back and forth in their bed of ballast, piling the sand and gravel into bolster-like ridges. At places where the sleepers held too tightly to their bed the rails themselves yielded and had been bent into snakelike curves. The actual process by which these appearances had been produced was in all probability an inverse but equivalent action—the rails and sleepers by their inertia and longitudinal rigidity remaining at rest while the ground moved back and forth beneath them. Another curious appearance observable along many sections of the track was that it had been bent bodily for several feet, sometimes to the right, sometimes to the left. These bends, it was observed, occurred where the line crossed, more or less at right angles, a slight depression, possibly marking the line of an ancient watercourse. At such places as these the impression conveyed was that the material in the trenches, which were from 50 to 100 yards in breadth, being softer than the surrounding country, had therefore conveyed a greater quantity of motion, which, striking the land transversely, had caused a permanent displacement. At these places and at many others where the country was uniformly level many fissures, which were generally parallel to the line, had been opened. They were usually from a few inches to two or three feet in width. In some districts they ran east and west, and in other districts north and south. From many of them mud, or a mixture of sand and water, had issued. Here and there small mud craters had been formed, the origin of which may be explained on the assumption of waves of compression, acting on beds of watery material beneath, bursting the superincumbent crust and shooting the soft material upwards. The most serious destruction, however, occurred at the bridges, which were designed and erected some five years ago by Mr. C. A. W. Pownall. These are almost entirely built of iron, put together in spans of from 100 feet to 200 feet, and stretching over lengths of as much as 1,800 feet. The supports in some cases are of masonry, being 10 feet in thickness, 26 feet in depth, and from 40 feet to 50 feet in height. The approaches to these bridges, which, it will be observed, are engineering structures of considerable size, are on embankments. Ascending one of these embankments you see the line before you twisted right and left, having the appearance of a gigantic serpent on a hillside. The ground is cracked and thrown into huge waves, whilst near the bridges the embankment has been shot from beneath the sleepers, so that the rails remain suspended in the air in huge catenary-like curves. The huge masonry piers have almost invariably been cut through near their base, and have then been danced and twisted from their true position. Some are inclined, and the heavy girders have slipped endways. Where cast-iron columns filled with cement were used as piers, fracture has again taken place near the base, and in one instance these huge cylinders have been snapped in several pieces, much as one might snap a carrot, and the fragments thrown outwards upon the shingle beaches of the river. Brick arches have simply fallen between their abutments, which appear to have opened outwards. For vertically-applied forces the structures, from an engineering point of view, were all that could be desired, but in consequence of horizontally-applied stresses the inertia of the upper parts has resulted in fracture at the base and an appalling destruction. For five years the railway works withstood traffic, typhoons and floods, fulfilling all the duties that were expected of them. When they succumbed it was not only to the unexpected, but to the application

of forces practically irresistible. Near the rivers, the free sides of which have allowed of motions larger than in the plains, fissures have opened large enough to take in men, and where several have occurred side by side sinkages have resulted which might engulf buildings. Villages and towns near these rivers, of which there are many, have been entirely levelled, and at one of them, containing some 1,900 people, 900 of the inhabitants lost their lives. The ruins of many towns caught fire, and hundreds who otherwise might have been rescued were lost in the flames. For twenty-eight miles no stations remain, only platforms and doors, covered with fissures and hummocked, thrown into waves, mark their places. The railway officials appear to have been singularly fortunate in escaping. This may possibly be attributed to the fact that, the station buildings being well constructed, they had not fallen so suddenly.

In many towns everything has disappeared, and in all directions as you travel across the country the thatched roofs of farmers' houses cover the fields like so many huge saddles. In towns like Nagoya, where, perhaps, only half the buildings have fallen, it is noticeable that no modern European structure of brick or stone has survived. Tall chimneys have collapsed, and cotton mills containing many thousands of spindles are heaps of ruins. The Nagoya earthquake will certainly act as a check to the adoption of so-called "foreign" structures. When building regulations are brought into force it is possible that the character of brick buildings may be improved, and they may at least be able to withstand earthquakes as well as Japanese buildings.

THE TOTNES TOWN HALL.

THE ancient town of Totnes, writes Sir J. C. Robinson, is one of the most delightfully unchanged and unspoilt places in this country, but the conscript fathers of the town seem to be quite unconscious of the charm which gives it pre-eminence over hundreds of bigger, richer and more bustling centres. If they had the remotest idea how original, interesting and venerable is their quaint old town-hall, with the ancient grammar-school tacked on to one side of it, both overshadowed by the grand old parish church, the very last thing they would do would be to make up their minds to pull down part of these buildings to erect in their place a hideous new police-station. Yet this is what the Totnes authorities are about to do. Can nothing be done to prevent this dire defacement of an old-world picture, beautiful and perfect in its way? The grammar-school is the doomed building. Kindly, however, let me make a suggestion. This structure, kept as it is outside, and but little altered within, would make an excellent and most appropriate town museum, an institution which as yet Totnes does not possess. On the face of it the site is entirely unsuitable for a police-station; it is quite out of the way, and without any carriage access: it can only be approached in fact by two long and narrow ancient alleys, scarcely wide enough, indeed, for a wheelbarrow to pass; one of these, indeed, ends in a steep flight of steps, which even that vehicle could not traverse. The first strokes of demolition have, I fear, commenced. Perhaps there is yet time to arrest the destruction, which, should it be consummated, most assuredly all the world and Totnes will bitterly regret.

SANITARY CONDITION OF FLORENCE.

AT a banquet recently given in his honour at Florence, Sir E. Douglas Galton, referring to the proposed sanitary improvements of the city, said:—"You will naturally wish me to say a few words upon my impressions of Florence. I have not been occupying myself during my short stay with art and artists, but with its engineers and its sanitation. There is one thing which strikes me prominently in considering this question, and that is the very great progress in health which Florence has made in recent years. In looking over the municipal archives I find a complete programme of works for the sanitary improvement of Florence, dating from 1870. These were—the regulation of the Arno, the prevention of floods in the town by new drainage, removing slaughterhouses out of town, the supply of water, the removal of low-class, insanitary dwellings, and replacing them by wider streets and better houses. These improvements are still in progress, but in order to give an idea of the effect they have already had, I took the death-rate over a long period, namely, from 1818 till 1877, when the operation of the improvements might be assumed to have commenced. I find that the average annual death-rate for that period was 346 per 10,000. In proportion as the new drains were constructed and the water from the Anconella became substituted for that of the wells in the town, the death-rate decreased gradually to 328, 286, 263 in the succeeding years, and in 1890 it was 263, notwithstanding the epidemic outbreak of typhoid in December. I have looked through the archives for an account of previous epidemics of typhoid in Florence. In 1816-17 there was an epidemic which carried off 2,000 victims, while last winter, as an evidence of the sanitary improvement of the city, only 234 succumbed. It may interest you to compare the epidemic of Florence with that of Pisa. The death-rate from the epidemic at Florence last winter per 10,000 was 12·79, whilst at Pisa the death-rate was 37·50 per 10,000. As a military engineer I took some interest in seeking out what effect the conditions at Florence have in respect to zymotic disease upon the garrison as compared with other garrisons in Italy. Out of 29 cities in Italy which have a numerous garrison only two present a lower mortality from typhoid than Florence, 26 have a larger mortality, many much larger. Indeed, many cities and some capitals of Europe show a greater typhoid rate. There has been undoubtedly a considerable improvement in the health of Florence in recent years. It is a gradual improvement, not only in general death-rate, but in that from preventable diseases, such as exposure, by typhoid, tuberculosis, &c. This improvement has followed the public works—that is to say, it has followed the length of drains made, the number of concessions made of *acqua potabile*, and the removal of old buildings. There remains, no doubt, much to be done to finish these works, but there can be no question that if these very important works of drainage are pushed on and arranged so as to enable Florence to send away rapidly all fæcal matter instead of retaining it in its midst, Florence would rapidly become one of the most healthy cities not only in Europe but in the world.

CHEMISTRY OF BUILDING MATERIALS.*

THE subject before us to-night, "The Chemistry of Building Materials," is one the proper treatment of which would occupy far more time than we have at our disposal. If I ventured upon the discussion of all the materials used in building, and the innumerable and often extremely complicated chemical processes involved in their manufacture and use, a dozen lectures would hardly suffice to do justice to the subject. I propose, therefore, to treat only one or two of the more important materials, and to confine myself to the main chemical reactions which take place. I will ask you then to consider this lecture rather as an introduction to the study of the chemistry of building materials. I shall endeavour to point out the differences in composition between the different varieties of stone used for building, and to discuss the action of the weather upon the different varieties. We shall study the different classes of mortars and cements, their composition, method of manufacture, and particularly the important point of their hardening and setting properties. I hope to be able to have time to say a few words as to the manufacture of the different varieties of iron.

I am of opinion that too much stress cannot be laid upon the necessity of a thorough knowledge of the part that chemistry plays in the formation and destruction of the materials used by the builder. A knowledge of the composition of the substances he uses is of invaluable aid to the conscientious architect; a knowledge of the destructive agencies that his materials will have to face will direct his choice in their selection and manufacture. Without such knowledge the weathering qualities of any stone could only be judged by the test of experience; by waiting fifty or sixty years to see how the stone stood the weather. A scientific knowledge of the materials employed and the agencies slowly at work at their destruction will enable him to remedy defects, to suggest improvements, and is indeed of absolute necessity to those who desire that their work shall progress; that each step forward shall be a distinct advance in experience and knowledge. Such a spirit, which has animated all the masters of their craft, can only be satisfied by a thorough knowledge of the conditions under which he works. I am confident that every architect present feels this to be true, and if there are any of the younger men who are of opinion that nothing more is required of the architect than to be able to draw out the plan and leave the working details to practical men, I warn him most strongly against that opinion. I do not mean to say that the architect should mix his own mortar and quarry his own stone; but I do maintain that he should thoroughly understand every detail of practical work connected with his profession, and should be imbued with the scientific spirit of inquiry and observation, if he desires that his work should be more than a mere contract job.

Stones used for building purposes may be divided into two classes, according to their composition. The hard siliceous stones—granite, basalt, porphyry, sand stones and the soft, which are derived from limestones—principally consist of calcium carbonate.

Granite is an igneous or metamorphous rock, occurring in the primary formations. It is a compact, granular, crystalline

* A paper by Mr. F. B. Guthrie, F.C.S., Demonstrator of Chemistry at the Sydney University, read at a meeting of the Sydney Architectural Association.

rock, composed of quartz, felspar and mica in varying proportions, of which felspar predominates. The felspar is white or pink orthoclase. Oligoclase and albite are common, and are distinguished by their fine striation and waxy appearance. The mica is usually Muscovite white silvery scales or biotite or lepidomelane (magnesian mica dark in colour.) The quartz, when in colourless crystals, is pure silica, but is frequently coloured. It surrounds the other ingredients like a wrapper, the mica and felspar being embedded in it. Granite is one of the most valuable of building stones, its hardness and compactness of texture rendering it able to resist in a high degree the action of rain and the indestructibility of its material towards chemical agents making it only slowly acted upon by the atmosphere. Small grained granite is the best, as it can be more easily and evenly worked and will weather better. Of its ingredients the felspar is usually the first to show signs of decay, the alkali and some silica being dissolved away, and clay being formed of the different varieties of felspar. Orthoclase or potash felspar wears most rapidly. The mica becomes in time yellow and soft. The quartz resists for a much longer time the action of wind and rain, and often stands out in relief on the surface of the stone. The weathering action is not always confined to the surface, but in the case of granites of little cohesion, is carried often to considerable depth by the soaking in of the rain. It has been known to be decomposed to the depth of over 50 feet in Dorsetshire, in England, where it is dug out of the earth with a spade, and extensively used in the manufacture of pottery.

Sulphide of iron is often found in crystals in granite. When this is in the form of ordinary yellow cubical pyrites, it appears to be harmless, but the sulphide is often found as white radiated crystals, known as marcasite. This substance weathers quickly, and is a most dangerous substance.

Syenite, in its geological sense, is in reality a syenitic granite in which the mica is replaced by hornblende, a silicate of lime and magnesia, the quartz being in considerable quantities, and gradually disappearing as it approaches true syenite in composition. Syenite has a somewhat higher specific gravity than granite. It has been formed under similar conditions, often erupted amongst metamorphic rocks.

Volcanic rocks, or trachyte, are often used as building stones. Trachyte consists chiefly of lava. The Victorian bluestone is a basalt rock.

Sandstones are simply sand, cemented together by different substances, usually quartz and calcium carbonate. The weathering properties of sandstone depend upon the cementing material. The colour is usually caused by the presence of iron. They exhibit often distinct beds of stratification, along which they have a tendency to split. Such rocks split in this way are called flagstones, and are used for paving.

Freestone is a name applied to any rock easily worked by a tool. Sandstone should effervesce feebly with acids; should not weigh less than 130 lbs. per cubic foot, nor absorb more than 5 per cent. of water in twenty-four hours.

Calcareous rocks include limestone, marble, chalk and such rocks as mainly consist of calcium carbonate. Limestones are compact rocks, of which there are many varieties. They are sedimentary rocks of aqueous origin, and contain usually fossil remains. Some are entirely made up of fossil shells bound together by cementing materials. Chalk is a soft pure variety of limestone.

Marble is a crystalline form, and has been formed from limestone by the action of great heat in a confined space, which does not allow of the escape of CO_2. It is highly crystalline and takes a high polish, which renders it very valuable to resist atmospheric influence.

Dolomite is a limestone where the lime has been replaced by magnesium, and consists of magnesium carbonate.

Sandstones and limestone are sedimentary rocks, and have been deposited by the action of water. Limestones are the most valuable rocks, as they not only form excellent stones for building, but furnish the basis of the different forms of mortar and cement. They are classed as compact or granular, the former occurring chiefly in carboniferous and in the lias, the latter being chiefly found in the lias.

The following points are of importance in the choice of a stone for ordinary work. The weathering power. That is, the extent to which it will resist the action of the weather. The weathering power of a stone is dependent upon its physical structure, its chemical composition and the nature of the atmosphere in which it is placed. The same stone will weather very differently under different atmospheric conditions. The most dangerous enemy that the stone has to contend against is rain, or a moist atmosphere. The air of towns is charged with carbonic acid, and in manufacturing towns is further loaded with hydrochloric and sulphuric acids. These acids are dissolved by the rain, and introduced by its means into the stone, penetrating more or less, according to the physical structure of the material. Even the oxygen of the air may act injuriously, notably on such stones as contain iron in the ferrous state. Under the combined action of air, moisture and carbonic acid, the ferrous iron, by a process of which I shall have occasion to speak later on, becomes oxidised and converted into ferric hydrate or rust, which form crumbling portions which are washed away by rain. This oxidation is sometimes accompanied by sufficient heat to cause expansion and consequent disintegration of the stone, as is notably the case with certain shales which contain pyrites. The pyrites are oxidised and converted into sulphate, and when such shales are moistened, they become hot and crack and crumble. Spontaneous ignition of coal in ships is thus caused. As I said, this is strongly marked in the case of stones containing iron in the ferrous state, the consequent oxidation causing the stone to become yellow and even red. This is noticeable in the Pyrmont stone known as Best Block, which assumes a fine yellow colour on exposure. In this case the change appears to be harmless, and increases the value of the stone rather than otherwise, as it gives the buildings a more beautiful appearance. The quantity of CO_2 in air varies from between 0·03 per cent. in fresh country air, to as much as 0·14 per cent. in dense fog in town. Under ordinary conditions, the quantity CO_2, in populous towns, in the absence of fogs, may rise as high as 0·08 per cent. (Dr. Russell.)

The action of carbonic acid upon carbonate of lime is to form a double carbonate which is soluble in water and washed away by the rain. Stones that are rich in calcium carbonate are therefore the most readily decomposed by rain or moist air charged with carbonic acid. It is found that the limestones are attacked by the small quantities of CO_2 found in the air of the country. The sulphuric and hydrochloric acid introduced by the agency of water exercise a similar solvent power, forming soluble sulphates and chlorides which are dissolved out, and these gradually disintegrate the stone. A further action of sulphuric acid is the formation in the pores of the stone of sulphates, which on the evaporation of the water crystallise out, and in so doing expand with irresistible force, and detach fragments of the stone in the process. A similar action, and one to which I need only refer here, is the action of frost, since it is not a re-agent that need be taken into account with us in Sydney, at all events. The water soaked up in the interior of the stone, under the influence of frost is converted into ice, and in so doing expands in the same manner as the sulphate, and breaks off fragments of the stone.

It is obvious from all that has been said above that a moist climate is more trying to a stone than a dry one, as the rain or moisture introduces the deleterious acids into the stone which would not be attacked by them in the perfectly dry atmosphere. And, further, that those stones which consist mainly of carbonates may be expected, other things being equal, to weather less well than those of which the indestructible substance, silica, is the main constituent. By this I mean that the structure of a block of granite may be expected to weather better than a block of limestone of nearly the same physical structure and exposed to the same atmosphere. A block of polished marble will resist the action of atmospheric agents as well, and often better than granite.

High wind is a dangerous enemy to a stone, as it blows sharp particles of dust against the surface, keeping up a continual bombardment, as it were, before which the hardest stone must in course of time gradually crumble. It also forces the rain further into the interior of the stone, and consequently exposes a larger portion to the disintegrating action. On the contrary, a gentle breeze is favourable to the preservation of the stone by drying out the moisture and causing it to evaporate. The warmth of the sun has a similar action in causing the evaporation of the moisture; though no doubt the alternate expansion and contraction of the stone caused by the heat of the sun and the removal of that heat has a slight though barely perceptible disintegrating action.

It is a matter of common observation that those portions of a building that are protected from the sun and breeze (such as the under surfaces of projecting mouldings) are especially liable to decay. This is due to the fact that the moisture accumulates at such points, and the evaporation being very slight, is retained there for a long time.

The physical structure of the stone is perhaps even more important than its chemical constitution as an index to its capability of standing the weather. Many substances of the same chemical composition are very different in physical appearance. A good example of this you have already had in the substances chalk and marble, both of which are composed of pure calcium carbonate. Chalk is friable, easily broken, and comes off on the fingers. Marble is a hard, dense, crystalline, homogeneous stone, not only resists most effectually the erosive action of atmospheric agents (that is the mechanical bombardment I have spoken of above), but is not exposed to anything like the same degree as a loose and porous stone, to the chemical action of the dissolved acids. The rain is not able to enter the stone so readily, and does not remain in contact with the stone for anything like the same length of time.

It may be taken as a general rule that stones that are crystalline in structure will weather better than amorphous

stones (chalk and marble). The closer and finer the grain, the better. A very porous stone should obviously be avoided for external work. Sandstones exhibiting distinct lines of stratification are very liable to wear, having a tendency to split along the lines of stratification. I have said enough to show that the physical structure of a stone is as important as its chemical composition in its choice. Other properties that determine the fitness of a stone for special work are the ease with which it can be worked with the tool, its strength, weight and appearance. These I will not speak further of, as they depend upon the sort of work for which the stone is to be used, the weight it has to bear, &c., and depend upon the practical working details.

The hardness of a stone is of course an important point. Stone used for exposed work should be hard, to be able to resist the mechanical bombardment of the weather. As a rule, therefore, the harder a stone is the better, provided that it can be readily worked. Hard stone is especially important for dressing, &c., wherever a sharp angle or arris is to be kept. It does not always follow that a soft stone will not weather well. Some limestones which are quite soft when freshly quarried acquire a hard surface on exposure, which is due partly to drying, *i.e.* escape of the quarry damp; partly to a slight decomposition taking place in exposure, which removes the softer particles. A well known example of this is the stone known as Bath stone. Neither of course do the hardest stones always weather best. Here again a knowledge of the chemical composition is of the greatest importance.

From our knowledge of the composition of our building stones, and the ingredients which possess weathering properties, we are able successfully to imitate natural stones. These artificial stones depend upon the formation of different insoluble silicates.

Ransome's stone may be taken as typical of such stones. It is manufactured by mixing dried sand with sodium silicate; the mixture is formed into blocks, and the blocks are immersed in calcium chloride, which penetrates the mass. On drying, this stone is found to be as hard as most building stones. The hardening depends upon the power of the calcium to combine with the silica present, forming an insoluble hard calcium silicate. Such stones are as good as most building stones; they have a fine homogeneous structure, and may be moulded with great ease into any form. They are especially useful for ornamental dressings.

Victoria stone is made by moulding finely powdered granite and Portland cement into blocks, and immersing them in sodium silicate. The calcium in the cement combines with the silica.

Mortar.—Lime does not occur free in nature—a fact readily accounted for by its powerful affinity for water and carbonic acid, by which it is converted into calcium carbonate. In this form it occurs abundantly in the secondary and tertiary formations, as limestones, chalk, marble, &c. The purest form of calcium carbonate is Iceland spar or arragonite. As a rock, the purest form is white marble, coloured marble being contaminated with iron, manganese and carbonaceous matter.

If $Ca\ CO_3$ be heated to a high temperature, it is decomposed; CO_2 is driven off and calcium oxide or quicklime results. It is important that CO_2 thus given off should be carried away at once. We have already seen that if strongly heated in confined space that does not allow of the escape of CO_2, it is not further decomposed, but may assume a crystalline structure. We have already seen that the formation of marble is due to this sort of action. The burning or calcining takes place in kilns of different structures, of which I shall not say anything further here than that they are formed on two models, the continuous and the intermittent process. In the continuous process the kiln is formed in the shape of an inverted truncated cone charged with alternate layers of limestone and coal. The lime as it is calcined sinks through the shaft, and is let off at the bottom, a fresh charge of coal and limestone being introduced at the top. In the intermittent process the stone broken into lumps is placed in a sort of arched fireplace constructed of brick and heated by burning coal below, only the flame being in actual contact with the stone. When the whole has attained the requisite temperature the kiln is allowed to cool down and the lime is removed.

The question as to which sort of kiln should be employed is one greatly dependent upon local surroundings, the quantity of fuel at command, and the quality of the lime required. By the use of the continuous kiln the quantity of fuel is greatly diminished; on the other hand, the lime obtained by this process is never so thoroughly burnt throughout, and is consequently usually inferior to the lime obtained by the intermittent or flare-kilns, as they are termed, the extra expense of the coal being largely compensated for by the superior quality of the lime. These flare-kilns frequently require re-lining. Whatever kiln is used it is important that the temperature should be uniform, and very much depends upon the kilnsman, who is able to judge if the temperature is correct by the appearance. Pure lime when heated has a peculiar luminous appearance. This luminosity is a guide to the kilnsman that the calcining is complete. Especially if the limestone contains siliceous matter is this important, for at a high temperature the silica enters into combination with the lime forming calcium silicate, which readily fuses and forms a glass over the surface. Such lime is said to be dead-burnt, and slakes very slowly. The limestone should not be too dry when introduced into the kiln. The moisture when converted into steam no doubt mechanically assists in carrying off the carbonic acid generated. It also forms a hydrate with the lime, expelling carbonic acid. This hydrate, on heating again, loses water or steam, which attacks fresh portions of the marble, and acts, in a manner, continuously. Care must also be taken to insure a thorough passage of air through the kiln, otherwise the Co_2 does not escape, and the result is an imperfectly burnt lime. We have already seen the result of subjecting $Ca\ Co_3$ to a high temperature without allowing for escape of Co_2.

The chemical processes that occur in the process of calcining are simply the expulsion of carbonic acid and water—$Ca\ Co_3 = Ca\ O + Co_2$. The lime obtained has the composition $Ca\ O$—calcium oxide, which is purer the more nearly the limestone approaches the composition of $Ca\ Co_3$. A gradual heat is necessary, as the gases evolved are given off with such violence as to shatter the stove. The temperature of the burning is dependent upon the composition of the stove. A low temperature is sufficient to expel the carbonic acid and water from the purest limestones, those containing clay requiring a stronger heat, care being taken to avoid vitrification. The presence of iron appears to lower the temperature required for calcining. Limes that have been over-burnt or under-burnt both slake with difficulty from opposite causes. In the case of over-burnt lime the inability to slake is due to the presence of the glass of Ca silicate. In the cases of under-burnt limes it is due to presence of uncalcined carbonate.

The lime obtained by the above process of calcining is a white hard substance, which has the power of absorbing water with great avidity, which process is known as slaking. When a lump of such lime is moistened with water it becomes hot, cracks and crumbles to pieces, forming what is known as slaked lime or calcium hydrate. The heat resolved is considerable in the case of pure lime, and is sufficient to set fire to gun-cotton. [The lecturer here made this experiment.] It has been made use of in loosening coal in fiery mines. The seam is bored 3 feet long by $2\frac{1}{2}$ inches, an iron tube $\frac{1}{2}$ inch diameter is then introduced and surrounded by compressed lime; water is poured through the iron tube, and the lime very soon begins to slake, the heat evolved being sufficient to crack and dislodge the coal. When slaked lime is made into a paste with water, it sets in a short time into a solid mass, and it is this principle which is taken advantage of in making mortar. This mass however gradually cracks and shrinks and falls to pieces, owing to want of cohesion between the particles. For this reason sand is invariably mixed with the lime, the lime and particles of sand cohere together, thus preventing shrinking and forming a homogeneous mass.

(*To be continued.*)

Correspondence

Architecture—A Profession or an Art?

SIR,—It seems rather strange to me—a not very young architect—that it should be thought necessary to go to the public journals to discuss a subject of this kind, in which the general public, with its present very small degree of art knowledge, can take but little interest. Unless Mr. Shaw and his friends think an association of any kind unnecessary for the artist, and that he must be free as the air if he is to do any good, I think their time and energies would be better spent in trying to persuade those with whom they cannot at present agree to fix upon a new organisation, with rules sufficiently simple and liberal that all the members of the different architectural societies now existing could join together in forming one strong association. Such an association would not put an end to personal differences of opinion, nor would it be at all desirable that it should do so if it were possible. Variety of opinion always will exist, and one of the benefits of the public organisation of universities and colleges is that individual learning, new discoveries, and what at first appear like strange opinions, are presented to us in the best manner possible, rendering the appeal of individuals to the public journals on comparatively unimportant matters of detail as unnecessary as it is undesirable.

Architecture is the first and noblest of the arts. It employs all the crafts and mysteries known for centuries past. Man no sooner appeared upon the earth than he built cities and towers.

Strange then it is that architects are not so well organised as any other important public body. There is no such thing as a College or University of Architecture. Consequently the public, by whom and for whom they exist, take no interest in their sayings and doings. They cannot understand them. If it should be attempted, the great advantage aimed at in any new departure should be, among other things, their education by means of interesting popular lectures, exhibitions, soirées—and though last not least—banquets. If the Academy of the Engineers, who find their advantage in showing hospitality to the public, can find interesting subjects to talk about to the entertainment of their guests, why not the architects, who have been busy creating wonders ever since the beginning of the world, and have always noble works to show, and whose business to day, as ever, is with the fine arts, the sciences and letters? The field for eloquence is simply vast, and doubtless if this proposed change can be organised, the day would soon return when princes felt it an honour to be the patrons of the architect and were fond of building magnificently.

But to conclude. As we all know, there have been bitter complaints about the organisation of the Royal Academy as well as the Royal Institute of Architects and the Architectural Association. Would it not be a noble result for the leading men of these and other cognate societies to meet together in a conference and establish a single Institution—call it the National or Royal University of Arts, or what you will—the laws of which should be so wise and simple that every artist and craftsman would, as a matter of course, naturally find his place under its roof? Then would our friend Furniss rejoice and be at peace. If something of this kind could be done it would be equally to the benefit of the public and the artist. A very small expenditure of money would be required, as the existing buildings would probably be sufficient. It is simply a matter of improved organisation—of a new Royal Charter—and wisely and liberally performed, would be equally a blessing to the British artist and an advantage to English art.

The one great essential of the new institution should be that all its ways and doings be open to the public—that its constitution be based upon popular as well as aristocratic support. With such an institution in evidence, it would be unnecessary to appeal to the press to settle such questions as "Architecture—A profession or an art?" PHIL-ARTES.

The Manchester Society of Architects.

SIR,—Your "Notes and Comments" of November 27 contain some reflections upon the status of the Manchester Society of Architects. As president of the junior society in Manchester at the date of its fusion with the senior society and as one who has taken an active part in the negotiations which have recently terminated successfully, will you kindly allow me space to take exception to the terms of the article above mentioned, the general tone of which, if left unquestioned, is calculated to injure the cause of architectural education in Manchester, and to give offence to those who, of their own initiative, have been the means of bringing about an amalgamation which has produced one of the strongest architectural societies in the provinces.

It must be remembered that the Manchester Society of Architects, founded about twenty-six years ago, consisted entirely of architects who had been in practice for not less than three years. It necessarily followed that so far as their own members were concerned, the question of training or education never has been one of the objects of its existence. At the same time, apart from many good works upon which it is needless for me to dwell, it has been mindful of its obligation to the students of architecture in our midst, and has awarded many valuable prizes gained in competition, also a travelling studentship. The junior society has also received substantial help in many ways from individual members of the senior society. For these some gratitude should be shown by those who have the true interests of architecture at heart, and I would further urge that the labour they have bestowed upon the reconstruction of their society, so as to combine both fellows, associates and students—in fact, to combine all those who are interested in the development of architectural knowledge—should be recognised in a far different spirit from the one pervading the article in question.

In your concluding remark you say that "with wise management the re-formed society will no doubt be able to render some service to the profession." I am convinced it will, that its career of usefulness will be very much extended, and that the educational work will be carried on in a more efficient and systematic manner than it has been done by the junior society in the past; but much of the voluntary labour required to bring this to a successful issue will necessarily devolve upon those who, if treated in the unappreciative spirit of your article, might be alienated from us. Any such proceeding would have a most disheartening effect upon the newly-constructed society, and I therefore ask you to insert this letter in the hope that all cause of offence may be avoided, and that we in Manchester may work in harmony for the good of the profession.—Yours faithfully,

THOMAS CHADWICK.

28 Faulkner Street, Manchester:
December 9, 1891.

Winter Needs: Funds and Friends.

SIR,—As during the nearly fifty years of its existence the Ragged School Union has built many new schools and mission-houses, it has had not a little to do with architects. Its relations with them have always been of a pleasant character, and it owes not a little to their kindness and skill. I should now like them to assist us in meeting the winter needs of the 50,000 poor children attending our 200 local centres. Those needs are food, clothing and bright entertainments. To satisfy them we are in want of money. No sums are too large or too small. They can reach us in the shape of individual offerings, or as the result of collections in offices, on works, and wherever men congregate. I should also like to say the Poor Children's Aid Society is now incorporated with this Union; also that our offices, long at Exeter Hall, are now as below.—Yours obediently, JOHN KIRK, Secretary.

Ragged School Union:
37 Norfolk Street, Strand, London, W.C.

NEW BUILDINGS.

Birmingham.—A mission-hall in Ellis Street, built by the congregation of the church of St. Thomas, was opened on December 5 by the Bishop of Coventry. The building comprises the hall, which will seat between 350 and 400 people, two entrance porches, classrooms or vestry, kitchen, storeroom for chairs, heating chamber, &c. The cost, including furniture, &c., has been about 1,300*l.* The architect is Mr. F. B. Osborn, and the builders Messrs. Hopkins & Son, Birmingham.

Cardiff.—A new building is being erected in Park Place, Cardiff, which, when completed, will be the home of the South Wales Institute of Engineers and the offices of the South Wales and Monmouthshire Coal Owners' Association. The building is of red bricks from Ruabon, with red stone dressings from the Shawk Quarries, near Carlisle. On the basement the heating chambers are located, and a well-lighted "specimen room" is provided, which will be used as a small museum. The ground floor has been arranged for the Institute, and contains a library, 38 feet 6 inches by 22 feet; a writing-room, 18 feet 6 inches by 22 feet; secretary's office, and a lecture theatre, 40 feet by 42 feet. The first floor, which has been devoted to the use of the coalowners, contains a conference-room, 38 feet 6 inches by 27 feet 6 inches, a committee-room and a smaller room, in addition to a suite of offices for the secretary. Mr. E. W. M. Corbett is the architect, and Messrs. Wm. Thomas & Co. the contractors.

GENERAL.

Sir Frederick Leighton, Bart., president of the Royal Academy, and Mr. Eaton, secretary, have just had an audience of the Queen, and submitted to Her Majesty the business of the Royal Academy.

Mr. Catterson Smith has been selected as secretary of the Royal Hibernian Academy of Arts, in place of the late Mr. Colles Watkins.

The Dowager Viscountess Galway has bequeathed to the Nottingham Castle Museum twenty-two original drawings in chalk and water-colours by great masters, including Giorgione, Geurcione, Guido Reni, Paul Veronese and Claude Lorraine; two frescoes on wood, and eleven marble and stone roundels, carved with figures and animals.

A Reredos, designed by Mr. Jethro A. Cossins, of Birmingham, has been placed in Holy Trinity Church, Leamington.

It is proposed to raise a fund for the purpose of providing in Carlisle Cathedral a memorial of the late Bishop Goodwin.

Sir John Maclean, F.S.A., of Clifton, author of "The Hundred of Trigg" and other valuable works, has been appointed president of the Royal Institution of Cornwall, his native county.

The Local Government Board have given assent to the application of the Croydon County Council for permission to expend the sum of 70,000*l.* in the erection of new municipal buildings. The work will be taken in hand almost immediately.

A Proposal is on foot at Glasgow to establish a hospital in the vicinity of the city for consumptives. The offer of a sum of 500*l.* to head a subscription-list for this purpose has been received.

The Architect.

THE WEEK.

THE first stage of the competition for the proposed Art Gallery in Glasgow has been passed. The six designs which will form the basis of the second competition are the following:—No. 9, Messrs. MALCOLM STARK & ROWNTREE, 189 St. Vincent Street, Glasgow; No. 17, Mr. THOMAS MANLY DEANE, of the firm of Sir THOMAS N. DEANE & SON, 3 Upper Merrion Street, Dublin; No. 25, Messrs. TREADWELL & MARTIN, 2 Waterloo Place, Pall Mall, London; No. 30, Messrs. JOHN W. SIMPSON & E. I. MILNER ALLEN, 10 New Inn, Strand, London; No. 40, Messrs. JOHN HONEYMAN & KEPPIE, 140 Bath Street, Glasgow; No. 48, Messrs. JOHN HONEYMAN & KEPPIE, 140 Bath Street, Glasgow. It will be observed that Messrs. HONEYMAN & KEPPIE have won a double chance, and, whatever may be the final result, their success in the first competition is remarkable. The committee being advised by Mr. WATERHOUSE that it would be inexpedient to exhibit the six selected designs, an opinion in which the architects concur, have resolved that, under these circumstances, the exhibition of the designs be delayed till after the final award, when, with consent of the architects, all the plans lodged will be placed in a convenient building for the inspection of the public.

AT the dinner of the Society of Engineers on Wednesday the president, Mr. COLAM, said he thought that the ever-increasing success of the Society of Engineers was mainly due, firstly, to the care which was bestowed in the selection of papers read and the opportunities given to the younger members of the profession to take part in the discussion; secondly, to the summer visits of members to works of engineering interest, at which opinions are freely exchanged with great mutual benefit; thirdly, to the honorary secretary and treasurer, Mr. ALFRED WILLIAMS, whose long experience, common sense and watchfulness was invaluable; and fourthly, to the energy and tact of the secretary, Mr. PRYCE-CUXSON. During the last year the increase of membership has been about 8 per cent., and the attendance at meetings about 5 per cent. Mr. J. W. WILSON was elected president for 1892, and Messrs. VALON, GOODWIN and ANDERSON as vice-presidents.

THERE are so many signs of rigorous discipline in Berlin, nobody can be surprised at the regulations for the use of water which are enforced in the city. In 1865 the charge for water was determined as in London, by the rent of the house where it was used, but gradually a more exact method was employed, and by 1878 the sale was exclusively by meter. The objections to the meter system do not, it appears, apply to Berlin. As might be expected, the system has come into favour in other German cities, and according to an official statistical table, referred to at the Institution of Civil Engineers last week, and which related to water supplies of 7⅝ millions, for the inhabitants of 77 German cities, in 26 per cent. it was apparent that the sale of water was exclusively by meter, and the control by meter of a considerable proportion of the remainder had been adopted. It was conceded that the great stringency with which the various Governments enforced the laws for the protection of the streams against pollution had promoted the adoption of the system, which was first introduced in Berlin.

THE annual meeting and dinner of the Royal Institute of the Architects of Ireland took place on the 12th inst. At the meeting the president, Mr. THOMAS DREW, R.A., gave an address dealing with the contrasts of architectural practice in 1891 and 1839, when the Institute was founded. A most agreeable concert was organised by some of the gentlemen of the choirs of the Dublin cathedrals, with both of which the President is connected as honorary architect. The programme opened with HAYES's old round, "Wind, gentle evergreen, to form a shade, Around the tomb where SOPHOCLES is laid," familiar to A.A. excursionists at many past annual dinners. In Dublin the art of dining out is traditional, and, in spite of the prevalence of discord, there is genuine musical talent available on such occasions. The Royal Hibernian Academy dinners with the double quartette singing of the amateur "Strollers" are already famous. The madrigal glee company of professional guests organised by the President of the Institute, is a good example as an aid towards the enlivenment of all inevitable professional dinners. Members of the choirs, with the President, contributed the part singing and some well chosen solos, and the members of the Institute, among which there is a considerable share of musical power, bore a part in carrying out a tuneful evening.

THE artists and amateurs of Dijon appear to have more respect for an official architect than is common in French towns, for they have elected M. CHARLES SUISSE, one of the Government architects, as President of the Société des Amis des Arts de la Côte d'Or. It has been decided to have an exhibition of paintings, architectural drawings, water-colours and works of sculpture in Dijon during the coming year, and it is to be hoped the new President will be able to rely on the co-operation of artists. M. SUISSE made a complete set of measured drawings of the cathedral of Dijon, which were exhibited this year; the French Government purchased them for the archives of the Historic Monuments Commission.

THE Executive Committee of the fund for providing a memorial to the late Field-Marshal Lord STRATHNAIRN have entrusted the commission for a bronze equestrian statue of the Field-Marshal to Mr. ONSLOW FORD, A.R.A. Great difficulty has been experienced in procuring a suitable site, and much time has been spent in approaching the various authorities for permission and obtaining their negative replies. The only site which now remains is at Knightsbridge, at the junction of the Knightsbridge and Brompton Roads, and the Westminster Vestry are prepared to give their assent to the erection of the statue there. Sir FREDERICK LEIGHTON, P.R.A., has approved of this site. Some of the subscribers were in favour of an alternative site in Belgrave Square, at the junction of Grosvenor Crescent and Halkin Street, but the St. George's Vestry vetoed it. The Knightsbridge site has been adopted by a considerable majority.

THE New York Superior Court appears to have a remarkable notion of the responsibility of architects. Some nine years ago, says the *American Architect*, a Miss JARVIS was sitting at the front window of a house on West One Hundred and Twenty-eighth Street, when a wall which had been built on the next lot fell over upon the house in which she was, and a mass of brick and mortar crashed through the roof and upper floor and struck Miss JARVIS, and injuring her severely and permanently. The girl's father sued the owner, Mr. CHARLES BAXTER, the architect, Mr. CHARLES H. FENTON, and the builder, jointly, for damages for the injury to his house, and, in his daughter's behalf, for further damages for her personal injuries. In both cases he obtained a verdict in his favour, the damages being fixed at 2,500 dols. in each case, or 5,000 dols. in all. The testimony went to show that the mortar used in building the wall was bad, but it seems rather hard to hold the architect and the owner responsible for this, which was probably a violation of the contract by the builder. However, as was once said by a Supreme Court judge in a similar case, a defective wall or structure is to be regarded in the same light as a dangerous beast. If the beast escapes and bites the public, all those concerned in keeping him tied up are jointly responsible for the damage he may do; and, while the architect and owner may not have caused, or even known, the vicious disposition of the wall, they should see, at their peril, that it is kept where it cannot, in any case, lay its claws on the neighbours.

ACCORDING to the official statement a sum of 24,064,000 francs, or say one million sterling, has been expended already on the church at Montmartre. It would be difficult to discover a building which, at first sight, presents a less satisfactory result for so large an outlay. It appears that 5,000,000 francs are required to complete the works in masonry. Painted-glass, decoration, altars, mosaics, frescoes and sculpture will have to be arranged for at a subsequent time. At present the services are conducted with inconvenience to all.

THE ADDRESS AT THE ROYAL ACADEMY.

[By a Correspondent.]

As the eloquent periods of the President have naturally, and very properly, great importance attached to them, and as, notwithstanding their charming effect upon his audience, it was impossible not to feel that there was an unsatisfactory lacuna and logical incompleteness in them, it is a duty for English architects—the objects of the address—to take note of it. It is true that he was talking to *students*, but, old or young, we are all students, and those of the Academy are not mere boys. We must assume that they are reflective beings, and, therefore, he who addresses ideas to them, or withholds information from them, accepts a position of very great responsibility. What was that position? Are we to think that the President has, advisedly and designedly, taken one of the cleverest and most important moves of the last half century for the vital advancement of modern architecture—to breathe life into a thing now dead?

French Gothic architecture of the thirteenth and fourteenth centuries is presented to our admiration in the most eloquent terms as a brilliant racial product, as if it were the beginning and end of all art. Its decline and extinction are noticed, and so is the Classical revival—the Renaissance. That is all. We have heard it all before, only in less beautiful language. But assuredly the President of the Academy cannot have taken the trouble of delivering an address for nearly two hours for the mere sake of indulging in the eloquence that seems to come so naturally to him. No; he would be the first to condemn and spurn such barren work, and as it is sometimes quite possible to know what men think by what they do not say almost as well as by what they do say, we may conclude that he is in perfect harmony of opinion with another late eloquent lecturer of the Academy, viz. that the glorious architecture of the thirteenth and fourteenth centuries should be adopted as the starting-point for modern work, because now, as then, it would be found capable of adapting itself to every new want of our ever-advancing civilisation. Like him, he has no stomach for the present fashion of copying debased buildings—for the ludicrous attempts to revive what were only bad imitations of Italian Renaissance structures. Well, if so, the President would have a very sufficient, numerous, and powerful following to start the new departure, and if his eloquence has had any lasting effect upon the students gathered round him on the Thursday (Dec. 10), we shall be coming within clear view of a new and perhaps glorious epoch in art. All that Sir Frederick Leighton says, however, in honour of the French builders and adorners of cathedrals is equally due to the English architects of those days—nay, rather there is historical evidence that Englishmen led the way in the general movement in art.

The grand front of Wells Cathedral, with its magnificent array of sculptures, was built in 1204 by Jocelyn Trotman, a bishop who was consecrated by King John at Reading in 1206, and who died in 1242. But the first stone of Rheims was only laid by Robert de Coucy in 1211. The works at Canterbury had been going on from 1125 to 1220, when William, "the Englishman," completed Becket's Crown to the general admiration, and great works were in progress at York and at St. Paul's Cathedral, London, at the same time.

"It is very remarkable," says Flaxman, "that Wells Cathedral was finished in 1242, two years *after the birth of Cimabue*, the restorer of painting in Italy; and the work was going on *at the same time* that Niccolo Pisano, the Italian restorer of sculpture, exercised the art in his own country, and it was finished forty-eight years before the cathedral of Orvieto was begun; and it seems to be the earliest specimen of such magnificent and varied sculpture united in a series of sacred history that is to be found in Western Europe."

D'Agincourt, says Niccolo (who was an architect as well as a sculptor), was born about 1200. The late Professor Cockerell considers the glorious sculptures at Lincoln Cathedral fully equal to the best Italian works of the thirteenth and fourteenth centuries. They were commenced 1256 and finished 1282.

Thus, while we have no wish to detract from the President's eulogium of the French race, we claim that Englishmen in the thirteenth and fourteenth centuries were not only its worthy rivals in art, but were characteristically leading rather than following.

If French ecclesiastical architecture of the thirteenth century had "its nice poise of mutually counteracting forces," so had English cathedrals of the same period. If "no one who has not seen, as one still may see in France, a cathedral of which the glass is preserved throughout, or nearly so, can form an idea of the effulgent magnificence and poetic charm which attach to this flinging of a heaven of colour about the majesty of the house of prayer," he has only to visit the Minster at York, if Westminster Abbey, owing to its comparatively small size, does not satisfy him. He will there find windows "limpid with hues of amethyst, sapphire and topaz, and fair as a May morning," or "deep and fervid as a midsummer night," and all made, not by men of the French, but of the English race.

Alas that times—that nature itself—should seem to be so changed! Perhaps the object of flashing the glorious achievements in architecture of the French race before the minds of young Englishmen, without a word about the splendid works of their ancestors, was to provoke them to take no rest till they have established a national school of architecture and the subsidiary arts, which will teach that clever draughtsmanship applied to copying old buildings is not architecture at all, though it is the fashion of the present time to accept it as such. Whether, as I supposed at the outset, this or something like this was in the mind of the President of the Royal Academy of Arts when addressing the students is, of course, uncertain; but assuredly it is a scheme the furtherance of which would be worthy of his brilliant powers and influence.

THE SYDNEY (N.S.W.) ARCHITECTURAL ASSOCIATION.

When writing lately about affairs in connection with the new hospital in Sydney, we mentioned a few circumstances which must have suggested the desirability of many changes in the practice of architecture in that distant capital. It was evident from what was revealed before the Parliamentary Committee that the competition system appears in Sydney under its worst aspects. In order to gain a public commission discreditable expedients are practised, and in consequence people have lost faith in architects. It was admitted by one witness that officials treat them with the contempt which is bestowed on the waifs and strays of humanity that are drifted to New South Wales. The hospital case, however, affords an opportunity for no more than a glimpse at professional life in Sydney, and it may well be feared that, if more could be known, the appearance of things would not become more attractive. That it is never too late to mend is an accepted doctrine in Australia, and it is possible that by this time many have become ashamed of tactics that seem to be derived from bush-rangers, and there is a more civilised recognition of the rights of others. But the young men who are to be the architects of the future have done well to take care of their own interests. They have set up a society in which conduct will count for something. The London rule has been widened, and if "the conduct of any member" (evidently other lapses besides those of professional practice are regarded) is considered to be derogatory to the Association the procedure for expulsion will be commenced. An association which will afford facilities for the study of civil architecture, advance the profession and serve as a medium of friendly communication between the members and others interested in the progress of art, has advantages wherever pupils and students are found, but there are many causes which concur to make one of the kind most apposite in Sydney at the present time. We hope it will be successful, and that the example of the members will have a beneficial effect upon those more ancient practitioners who are recalcitrant to modern ideas of business.

The Sydney Association is under the presidency of Mr. S. Hurst Seager; the vice-presidents are Mr. G. J. Oakeshott and Mr. G. D. Payne, and the secretaries are Messrs. Harold O. Jackson and J. P. Power. It is difficult to organise a society of the kind without the help

of time, but although the Association is not a year in existence, it appears to be already in working order. There are junior and advanced classes for construction and design, meetings at which papers are read and discussed, exhibitions of drawings, visits to buildings, a library, and a publication in which the progress of the Association is recorded. The lines followed are generally those of the London Association in the old days, and it is satisfactory to find so successful an imitation.

At the first meeting the President warned the members about the effects of indifference to the classes. It appears that in Melbourne "the classes were said to have failed in their purpose through the lack of interest evinced in them." In the construction classes the questions are given out a month before the meeting takes place, and it is expected that they will be systematically worked out. At the meeting the results are discussed. Among the subjects treated have been shoring, foundations, walling, piers, columns, arches, trusses, beams and floors, roof coverings, &c. The report of the last meeting, which is dated September 23, states that four papers were sent, and three supplied answers to all the questions. In the classes of design, the drawings of the subjects assigned are to be in pencil. After criticism by the Visitor, they are to be inked in or neatly finished in pencil. The subjects were not beyond the powers of the members, and include a cottage hospital, a suburban residence, a village school, a village church, a country hotel, a small art gallery, &c. According to the last report, only one design in the advanced class was considered as coming within the sum stipulated for erection, and out of four designs only one was Gothic. In the elementary class, it was said that only one student showed a grasp of the subject, which was a park entrance and lodge. But it is not to be expected that beginners can be perfected in the course of a few months. Styles are specially studied in a class.

The papers read at the monthly meetings are quite equal to those presented at societies' meetings in London or the provinces. In succession to the President's address, Mr. F. W. WOODHOUSE lectured on "Art: its claims as a study in relation to history," Mr. G. T. OAKESHOTT on "Sketching," and Mr. F. W. MARKS on "Five Famous Domes." In addition, Mr. MARDEN, the consulting botanist to the Forest Department, read a paper on "Some Ornamental New South Wales Timbers," Mr. GUTHRIE, F.C.S., on "The Chemistry of Building Materials and Professor WARREN on "Stresses in Constructional Ironwork." We have reprinted Mr. GUTHRIE's paper, which will suggest that the students in Sydney cannot consider themselves to be less favoured in respect of technical knowledge than their friends in England.

The Association would not be worthy of its title if some of the members did not dream of the possibility of creating a style that would represent and belong to New South Wales. Perhaps those ardent youths did not relish the following remarks from Mr. WOODWARD, which are, however, applicable in other places :—

> Much is often spoken and written with regard to the desirability and possibility of creating or inventing a new style, not only of architecture, but of pictorial and decorative art for this new country. Now we cannot bestow even the most cursory attention on the history of art without seeing that a new style "cometh not with observation." No artist or craftsman of old yet said, "Go to, let us create a new style or order." Various men in these latter days have thought to do so, but their inventions have perished or withered away, "because they had no root," surviving only as curiosities—examples of the aberrations of the human mind. No! styles, whether of painting, sculpture or architecture in all their details, down to the lowest, grew as grows the grass of the field, the trees of the forest, silently, surely, unhasting, unresting. In this the analogy with the growth of the speech of mankind is perfect. Even supposing it to be desirable nowadays, is it likely that the genius is to arise here who shall do what it has taken the combined effort of generations of the master-minds of the world to accomplish? Do not conclude that this need act as a discouraging thought. Each has power to do what those master-spirits of the past did, to add each his line, his touch, his thought to the work of his time and country, letting his mind work freely on the material provided by others, not in servile imitation, still less in efforts after originality at any price, but frankly accepting the good, and moulding it to his requirements. It certainly never occurred to the Mediæval craftsman that in selecting the oak or maple in preference to the dogtooth or trefoil he was inventing a new style, and it is not by using the waratah or wallaby, the lyre-bird or flannel-flower, as motives for decoration that we shall create an Australian style; but, if it is to be done at all, it will be by the full expression of our thoughts, our aspirations, our wants, our hopes and fears. If these be noble and beautiful, true and devoid of sham, so also will be our buildings; if servile, mercenary, superficial, ostentatious, then our houses, our banks, our offices, even our churches, will reflect these characteristics of our inmost soul.

It is evident that one of the desires of the officers is the obtaining of precise information upon the building materials of the colony, and in course of time the *Sydney Architectural Association Notes* will be authoritative on the subject. A good example of the kind of paper that helps to attain that end is Mr. MARDEN's on "Ornamental Timbers." From it we find that red cedar has already become scarce, and that replanting has had to be undertaken by the Forest Department in order to provide for the requirements of the future. Rosewood is still obtainable in large quantities in pieces of from 10 to 20 feet in length and 12 to 34 inches in width, the price in the log being 15*s*. per 100 feet. Mr. MARDEN says it works well, shrinks little, and is of good appearance. But Mr. POWER, the secretary, said his experience of rosewood was not satisfactory. It was needed for counter-tops, and he found that it split in seasoning, and out of a supply there was not enough to make one counter-top. American timber had at last to be substituted. The red or black pine was described by Mr. MARDEN as proof against the white ant, but, on the other hand, the timber is brittle and inflammable, and it is impossible to drive a nail without preliminary boring. The chestnuts or beans afford beautiful timber, but the stockowners look on the trees as dangerous to cattle, and cut them down without mercy. According to Mr. MARDEN, the loss of timber wealth must have been enormous. Blackwood resembles American walnut. Tulipwood is valuable for cabinetwork; it has been used for panels in doors and dados, "and with selected pieces the effect may be described as gorgeous." Root stocks, which elsewhere are valuable, are generally neglected in New South Wales, although fine veneers are obtainable from them. But as yet much has to be discovered about the endurance of timbers. In the Penrith Bridge hard but unseasoned woods were used and covered with tar, but they decayed rapidly.

Judging by the work already accomplished, the Sydney Association would appear to have a most useful future before it; and if the energy which now marks the arrangements can be continued the Association is likely to become the foremost architectural society in the colony.

FRENCH ARCHITECTURE.*

By SIR FREDERICK LEIGHTON, P.R.A.

STUDENTS of the Royal Academy,—Pursuing the subject which I have for some years past proposed to myself in these addresses to you—namely, the relation between artistic production and its surrounding conditions—I dealt with it, you may remember, at our last biennial gatherings in connection with two members of the so-called Latin group—the Italian and the Spanish peoples. I purpose to-night to complete our survey of that group by speaking to you of its third member—the people of France.

The task is one which I approach with no small misgiving; in the first place, because the evolution of the artistic genius of the French having been uninterrupted from the days of Charlemagne to the days in which we live, an account which shall stop short, as this account needs must, on the threshold of modern times, can offer but a mutilated picture; and in the second, because that genius, which is in the very life-blood of the race, has found vent over so wide a field that it is not possible within the limits of an address, even though I draw largely on your patience, to do more than indicate in the most summary manner the forms it has assumed and the fruit it has borne. Indeed, I shall be forced to lay stress on one form only of its manifestations, touching but incidentally on others; and the topic on which I shall mainly dwell is one which plainly imposes itself by its paramount interest. Vast, indeed, is the field over which the creative genius of the French has been active; not architecture, sculpture and painting have alone absorbed its energies, every form of industrial production has furnished material for its exercise, and has received its stamp. But among its nobler manifestations there is one—its achievement in architecture in the Middle Ages—to which France owes a position of pre-eminence that until the present century she could not claim in either of the sister arts. Fortunately for our inquiry there is nothing from which we may learn more of a

* An address delivered to the students of the Royal Academy at the distribution of prizes on the 10th inst.

race in its days of spontaneous artistic production than its expression in architecture.

In architecture the French have a supreme claim on our admiration, for on the very dawn of modern days they conceived, and, having once conceived, evolved with an unerring certainty of logical procession and with a swiftness surpassed only by the sudden ripening of Greek sculpture in the fifth century before Christ a style of architecture based on a principle wholly new, not only differing from but directly opposite to that which had governed the builders of Rome and Athens respectively, a style which spread rapidly and triumphantly over the whole of Western and Central Europe, and which has in its unity, its flexibility and its varied splendour found no peer since the days of its decline. I mean, of course, the style which, more rightly spoken of once as Frankish—"opus Francigenum"—is now known by a name given to it at first in scorn, the "Gothic" style. To the evolution of this style and to its gradual supersession in the sixteenth century under the influence of the revival of Classic feeling, I propose to devote mainly to-night such few considerations as the limits of our time admit.

But first let us glance at the composition and at the home of this great unrestful, initiating race. It occupies a broad and fertile region blessed with a temperate climate, fanned on three sides by the breath of the sea, favoured with bright skies and a light keen air, which quickens the wit and gladdens the spirit. In this land is bred a mercurial, light-hearted race—one, now, and united, but built up of varied elements, and for a long time fiercely divided within itself. What are these various elements? As far back as sure knowledge reaches—for of those earliest artists, the aboriginal cave-dwellers, but little can be known—we find the country unequally divided between Celtic tribes and an Iberian race, which latter sat on the slopes of the Pyrenees and was spread over the Spanish Peninsula. Now the Celtic tribes which occupied respectively the north and centre of what was one day to be France represented, speaking broadly, two successive immigrations, the earlier that of the Gauls, the later that of the Cymri, and these two tribes, or groups of tribes, furnished different elements to the national character, the Gaul being the more mercurial and indocile—"Ie Celte indocile" Michelet calls him—the Cymri more staid and open to discipline. Along the southern seaboard the ubiquitous Phœnician—need it be said?—set up his counting-houses, penetrating thence to some distance into the interior. Greeks, too, traded with and colonised the region known to us as Provence, founding Phocæan Massilia in the sixth century before Christ.

The genius of Celtic France was thus early fed and strengthened by foreign elements. "Toutes les races du monde," Michelet finely says, "ont contribué pour doter cette Pandore." Nevertheless, we must not lose sight of the fact that the Gallic stock, of which an unquenchable vitality is the primary characteristic, remained in numbers greatly superior to the foreign infusion, though probably the estimate of Amédée Thierry that nineteen-twentieths of modern Frenchmen descend from them must be taken with much reserve; the Gauls never in their thraldom forgot their blood, and in the great upheaval of 1789 the old undying, smouldering consciousness burst into lurid flame. "For more than thirteen centuries," says Guizot, "the conquered people had struggled to shake off the yoke of the conquering race; our history is the history of that struggle," and this duality within the French race is the key to much that is perplexing in the evolution of its intellectual life. Well, what are the main characteristics of this Gaulish people? They are a love of fighting and a magnificent bravery, great impatience of control, a passion for new things, a swift, brilliant, logical intelligence, a gay and mocking spirit, for "to laugh," says Rabelais, "is the proper mark of man"—an inextinguishable self-confidence; the best French writers, whom I may not contradict, add an excessive vanity. And to this native fund were brought from without modifying elements of discipline and control; we shall presently see with what result. The first centuries of Teutonic dominion have left no traces of artistic activity on French soil; for 300 years art slumbered amidst the din and devastation of intertribal war, but if in these dark days the memory of Roman splendour became dim and all tradition of methods of building was effaced, the unborn genius of the Gallic race ripened during this period of incubation towards a freer, a more personal, and a more vigorous life than would have been compatible with a continuous tradition, and accordingly its initiating force makes itself felt at once on the revival of building.

It was that great ruler Charlemagne who first called architecture out of its sleep. Filled with his large conception of an empire of the west, the heir to the greatness of Rome, his mind turned, as was natural, to the restoration of Gallo-Roman splendour. To this end he called around him artists and skilled workmen from the south and east. The Roman basilica was taken as the model of the new churches which, under his encouragement and with his aid, the monastic communities began to raise through the land, and thus Roman architecture became the starting-point of the new development of the art of building.

Nevertheless, other foreign influences became early active through contact, direct or indirect, with other races. An illustration of the profound modifications which such contact could bring about may be found in a comparison, for example, between the sculptured façade of the church of St. Gilles, in Provence, a region much under Roman and Greek influences, and the church of St. Front, at Perigueux. The latter church was begun, according to Viollet-le-Duc, towards the end of the tenth century, a few years after St. Mark's, in Venice, and practically on the same plan; the former is of much later date, yet the southern example is still strongly impregnated with Classic tradition, whilst the Acquitanian church, with its five domes, is wholly Byzantine in its general character. Here the inspiration is derived undoubtedly from the Venetians, who at an early period had established a trade route through France to the western seas, and had an important mart at Limoges; and it is an interesting fact that during the eleventh and twelfth centuries it is in Acquitania alone—that is, in the province within more immediate touch of Venetian influence—that domical churches were built. Now, both these instances, illustrating as they do in a marked manner the receptivity of the Gallic intelligence, exhibit, also conspicuously, the freedom with which it fashioned foreign elements to its uses. This freedom is almost startlingly displayed at St. Gilles, where Classic material is handled with an audacity which, if leading in some points to an almost barbaric incongruity, produce a result in the last degree impressive and stimulating. The work is thoroughly southern; it has none of that logical and orderly cogency which was already at that date the mark of the work of the Gallo-Franks in the north; but it is a work of true genius, and to me infinitely fascinating. At Perigueux also we find the fire of native genius forming and fashioning material not indigenous. In ground plan, as I have said, St. Front is almost identical with St. Mark's, and in its general structural features has much analogy with the Venetian church; nevertheless, the impression produced—I speak of course of the form, for the colour is now from floor to roof that of stone newly and sacrilegiously flayed and scraped—is wholly different; that love for slender and soaring forms which was to mark French architecture in the future is already evident; forms which in the Venetian model are sturdy and squat are elongated here almost to slimness: the whole proportion, and therefore the whole character is changed; the Venetian idea has been, so to speak, translated into French.

The impulse towards a revival of architecture was, we saw, given by Charlemagne, but it was not till the tenth and eleventh centuries that the movement reached its full force; and its development was due mainly to the great monastic community which, founded by St. Benedict early in the sixth century, had poured from the heights of Monte Cassino its beneficent influence over Western Europe. This famous Order had become a mighty power in France, controlling from the central foundation at Cluny not less, it is affirmed, than 314 monasteries and churches over the face of the country, and had offered in days when the land, half wilderness and half shambles, was given over to fire and sword, a sacred refuge and a stronghold to whatever of refinement, of knowledge and of culture still struggled to live. Under the protection of the Crown the convents long remained the sole centres of intellectual light; and if, in the second half of the twelfth century building passes, owing to the development of municipal institutions, mainly into the hands of lay craftsmen—though under the influence of kings and bishops—it was, nevertheless, in the days of paramount monastic influences that the ogival style was initiated and evolved. Let us see by what steps.

The model first adopted in the greater part of France for the uses of the Christian church was, I said, the basilica of the Romans, with its nave and its aisles, its narthex and its apse; in this model, however, certain modifications were needed to meet the requirements of Christian worship and ritual, or for safety, and out of them grew the type of church known as Romanesque. Of these modifications one, the substitution of waggon-headed vaults for timber roofs—a change made necessary by the frequent occurrence of fires—led to momentous consequences, for it is, as we shall see, in the problems of vaulting that the so-called Gothic style had birth. In the vaulted buildings of the Romans stability was obtained through inert resistance: the solid weight of their vaults was taken up by solid masses of brickwork and concrete—you may, in fact, regard these edifices as virtually hewn out of a solid block.

The substitution of the principle of a balance of active forces to this principle of inert resistance is probably the greatest revolution ever introduced in the science of building; we have here the generative principle of Gothic architecture, its essence and its life. How this revolution was brought about I can, of course, only indicate to you in summary outline. Let us first note in passing that the presence of a pointed arch, except as a

structural form, does not constitute Gothic architecture. Isolated radiating pointed arches have been built in ages and countries in which the Gothic style was not dreamt of; a building might be Gothic in structure and principle without showing a pointed opening anywhere; it is through the roof, not through the window, that the formative Gothic idea entered. Let us try to follow rapidly some of the main steps by which it reached its ultimate development.

The first substitute for the discarded timber roof was the waggon vault thrown first tentatively over the aisles, then over the nave; and here an element of weakness soon made itself felt—the walls of the nave carried on piers, and of no great thickness, were not equal to the outward thrust of the vault, and gave way. Various expedients were resorted to; buttresses were added at the points corresponding with the piers, a transverse band or rib was flung across the nave from pier to pier, the vault from being circular was, in some cases, broken and made pointed, rendering the thrust more vertical, but leaving it continuous. The problem was not yet solved; a counteracting force, in which we see the germ of the flying buttress, had, in certain regions, been applied, namely, a half-waggon vault above the side aisles taking up the pressure of the central vault; but this arrangement condemned to practical darkness the upper part of the nave, which, instead of windows, showed a cavernous gallery. In Acquitania, as we have already seen, a succession of cupolas on pendentives was early adopted—an arrangement which, though, as in the case of the cathedral of Le Puy, it yields grand impressive effects, is in many respects unsatisfying. An important step in the new direction was next taken at Vézelay, where intersecting vaults, but without ribs, were substituted for the continuous waggon-head, the thrust of the vaulting being thus directed to the supporting piles. This arrangement was, however, still found unsatisfactory, and on a narthex being added or rebuilt on a large scale, the same disposition of vaults was retained, but they were made pointed instead of round. A few years later, in the early middle of the twelfth century, a Benedictine monk, feeble of frame, but of a lofty spirit, Suger, the great Abbot of St. Denis—who has on sculptors, by-the-by, this special claim, that he boldly withstood the bitter denunciations launched by St. Bernard against the sculptural decoration of churches—began the erection of a church in which the tentative gropings, at which I have just hinted, gave place to the systematic and logical application of a new and fruitful conception—the idea of stability based on the balance of active forces, expressed in a self-sustaining combination of upright supports and vaulting ribs, with detached buttresses bringing their action to bear exactly on the points at which the thrust of the vaults is gathered up.

So late as the days in which Viollet-le-Duc wrote his great "Dictionary of Architecture" it was believed, and he endorsed the belief, that this far-reaching conception had arisen suddenly and spontaneously in the brain of one man. More recent investigation, in which M. L. Gouse, in his sumptuous work on "Gothic Art," has, so far, said the last word, has brought our knowledge more into harmony with the general analogy of things. To the famous abbot belongs, it is true, as I have said, the honour of the first systematic application of the new principle, and his great work must ever remain a landmark in the history of architecture; but it was, in fact, only the last and most complete of a series of experiments covering a period of nearly half a century—experiments of which the earliest is seen in the church of a benedictine monastery at Morienval. This church is in the heart of the group of provinces called the "Domaine Royal," of which Paris, the seat of royalty, was the centre, and it is within this Frankish region that the various other tentatives to which I have alluded are to be traced; it is in this region also that it reached its fullest development and left its most perfect achievements. External conditions were doubtless favourable to that growth; the wealth and patronage of kings and bishops were propitious to the builders of the day; but to these incentives from above was added another which had a deep and lasting bearing upon the revolution which was taking place in architecture, namely, the development of the communes. This development, fostered not only by the kings but by the bishops, who viewed uneasily the strength and independence of the monastic bodies, gave, by laicising it, if I may use the word, a new direction to the art of building. Cathedrals, not abbeys, were now built—wider and loftier structures, breathing an area of larger freedom and expressing a fuller public life. From this day forward the trammels of antique tradition were wholly cast aside, and whilst French architects constructed in a style born on their own soil, they looked at home henceforth for its decoration in the lanes and fields of their native country. In a tumult of creative energy Gothic architecture leapt to its height in an amazingly short space of time. Between the great reign of Philippe Auguste and that of Louis the Saint nearly all the great cathedrals of France were begun or reached completion.

But, indeed, the epoch was in many ways favourable to a great intellectual movement in France. Paris was in the thirteenth century a famous centre and focus of intellectual activity; the French language was widely known in Europe; Brunetto Latini, the master of Dante, wrote his "Trésor" in that tongue, on the ground that it was beyond all others *délitable et commune à toutes gens*. But if these general conditions of intellectual energy favoured the growth of the new phase of art, the peculiar aptitudes of the race were singularly calculated to promote it. The rise and evolution of ogival architecture is proper, we said, to the Domaine Royal—the north and centre of France. Well, what was the race that occupied this region? It was a race of which the basis was Cymric, formed therefore from the more stable and disciplinable of the two Celtic groups; but on this root, enriched already by a Latin element, was grafted a considerable Teutonic growth, which must of necessity have exercised an important modifying influence. Now, this combination would seem well suited to produce that admirably poised compound which we see in the French genius at its best—a genius which, if it is conspicuous for the restless energy, the fearlessness of intellect, and the eager grasp of new ideas which mark the native Gaul, reveals also a sense of measure, a precision, a sobriety and a balance which point to the chastening influences of other blood.

By the side of these general characteristics, we have to note certain purely artistic peculiarities. There is, for instance, a sense of the decorative in form in which the French have remained unrivalled. But I would draw your attention especially to a characteristic bent which has played no small part in the development of their architecture, namely, a strong leaning to long ascending lines, to slimness of proportion and to perpendicular parallelism. You may see a curious illustration of this propensity in a seemingly insignificant matter—the timbering of the rural architecture in the north and centre of France. The cottages on which you will note what I am about to point out are, of course, mostly of modern date, but they represent a tradition of which you may trace the source in the oldest part of those towns in which timbered structures of an early period are still preserved. If you look at the timbering of a cottage or house in a purely Teutonic country—in Germany or German Switzerland—you will find that the spaces left between uprights and horizontals are approximately square and crossed with rather frequent diagonal lines; in the French examples, on the contrary, whilst the diagonal lines are very few, the perpendicular line is absolutely dominant; one horizontal line generally sufficing for a whole wall or gable front, and the vertical timbers being brought so close that the space between them is often no wider than the timber itself. To this strong leaning I shall have occasion to draw your attention again further on.

Now it seems to me, I repeat, that the race at whose attributes and physiognomy we have just glanced was peculiarly fitted to conceive and develop the new style of building—a style in which inertness is replaced by active force, a style which, while in its absolute plasticity it offered the widest scope for innovating genius, required nevertheless for its fullest development the logical clearness and grasp of ideas which were conspicuous in the mental equipment of that race, a style in which liberty and restraint, audacity and prudence, science and emotion were so marvellously blended. It was through the balance of these opposite qualities that Gothic building reached its highest level; it was in the disturbance of that balance, in the undue encroachment of mathematics on sound artistic feeling, that the seed of its decline was sown. From the moment that all the forces of which the poise and stability of a structure were the result were gathered up into a system of ribs, shafts, buttresses and pinnacles, forming a complete self-sustaining skeleton, carrying a roof, not of concrete, but having the play and life of masonry, it became evident that structurally the wall had become superfluous; it was a mere screen, and accordingly the Frankish architects proceeded with constantly-increasing boldness to its suppression, gradually restricting the solids almost wholly to constructive functions; manifest construction became thus a leading leature of the style. You see at a glance how, apart from the primary statical motive, the broken arch became in vaulting almost a necessity; the sides of a square being shorter than its diameter, it is evident that a round arch struck diagonally across it must be higher than the arches spanning its sides, and if the field to be vaulted is a parallelogram or irregular in plan, the number of unequal levels at the key of the arches is further multiplied, and those levels can only be brought into even approximate harmony either by stilting the smaller ones, as was done at first, or by breaking the arches, and this latter course soon became universal.

The pointed arch having thus asserted its place in the construction of a building, the desire to suppress all superfluous wall-space, allied to a sense of fitness, prompted its adoption in the case of the windows, which presently reigned over the whole space between pier and pier, and this expansion of the field of light was further demanded for the display of stained-glass, to which growing importance was constantly given as an element of effect in the internal decoration of churches, and with glorious results. No one who has not seen, as one still may see in France, a cathedral of which the glass is preserved

throughout, or nearly so, can form an idea of the effulgent magnificence and poetic charm which attach to this flinging of a heaven of colour about the majesty of the house of prayer. I may note, by the way, that in France this effect is often heightened by the glazing of the triforium, which is opened out by the substitution of a ridge-roof for a lean-to over the aisles.

But whilst the germs of this architectural growth found favouring soil in the intellectual temper of the race that initiated it, the peculiar æsthetic bent to which I have called your attention, the love of slim and aspiring lines, had special scope in a style in which the operative forces might be gathered up in increasingly slender channels, and in which horizontal lines had no necessary place except to satisfy the eye with a sense of binding between the parts; and in truth the horizontal line rapidly dwindled, almost in some cases to effacement. So, for instance, in the cathedral of Clermont-Ferrand—I quote it because it is peculiarly happy in its elegant proportions—the only horizontal in the whole building, if we except the window-sills, is a very narrow string along the base of the triforium, and this does not go round the pier shafts, which spring, absolutely unbroken, from floor to roof. The supremacy of the vertical line is here further emphasised by the carrying of the shafts of the clerestory windows—as is not infrequent in France—down through the triforium, which thus becomes, in a manner, one with the upper lights. The total effect is extremely dignified, and gives that sense of satisfaction which is inseparable from the spectacle of a constantly-developed dominant idea.

(*To be continued.*)

CHEMISTRY OF BUILDING MATERIALS.*

(*Concluded from page* 371.)

IN actual practice the following process is followed more or less. The quicklime is first slaked with water in the proportion of one of lime to three of water; when thoroughly slaked it is intimately mixed with three or four parts of clean sharp sand and sufficient water to uniform thin paste. The sand used should be thoroughly clean and contain sharp particles. That which has been rounded by the action of water, such as sea-sand, is best. The best sand is powdered quartz or flint. Instead of sand, burnt clay or slag or clinker pozzuolana, the vitrified produce of volcanoes, are often employed. In all these cases care must be taken that the substance is clean and contains sharp particles. The setting of mortar is due simply to drying; the hardening is due to the absorption of carbonic acid from the air and the formation of Ca Co_3. Mortars set in a few hours, but require many years of exposure before they attain their maximum of hardness. It has been found that mortar taken from the Pyramids actually contains free lime in the interior where it has not been exposed to the action of the air. The process then is briefly this: when the lime has set, *i.e.* dried, it begins to absorb Co_2, the calcium carbonate so formed cementing the sand and the building materials (brick) together. It is to be noticed in this point that dry lime only has the power of absorbing Co_2, moist lime does not do so. The sand is merely a mechanical ingredient and plays no part in the chemical process of hardening, neither does it, as has been supposed, combine with the lime in any way. Its action is, as has before been stated, to separate the grains of mortar, and to provide a nucleus for the lime to harden upon, and by making the substance of the mortar more porous, to assist the passage of air and consequently Co_2 into the interior. From analyses of old Roman cement found in Kent, England, by Arnold Spiller, it appears that the whole of the lime is in combination with Co_3 as Ca Co_3, except in such cases where the Co_2 has not penetrated into the interior and it is still in the condition of calcium hydrate. There is no evidence of the formation of silicate. The water originally present in these cements, examined by Mr. Spiller, would appear to have been entirely eliminated, and the amorphous carbonate of lime, by the joint action of carbonic acid and water from the air, has been gradually converted into a crystalline form, a process that would undoubtedly tend to harden the mass. Limes are classed according to their purity and their hydraulicity:—Rich or fat limes, which are nearly pure, Ca O. Poor limes, containing more or less silica as sand or quartz, inert, slightly hydraulic, hydraulic, eminently hydraulic, hydraulic mortars. Hydraulic mortars are such as possess the property of hardening under water or in the presence of water. The above subdivisions discriminate limes which possess to a greater or less degree the power of setting under water or in the absence of air. This property is induced by the presence in the limestone of certain constituents, the most important of which is undoubtedly clay. The presence of clay modifies the slaking action in addition to conferring the power of hydraulicity. Clay is a silicate of alumina, and contains silica in what is known as the soluble form of hydrated silicic acid, in contradistinction to sand, quartz and flint, which consist of insoluble anhydrous Si O_2. I can do no more than state this fact here—the study of these varieties of silicic acid is one which is of extreme interest, both theoretically and practically, but unfortunately also one on which I dare not trust myself in the short space allowed me. The important nature of the difference is, however, so great that all analyses of limestones, to be of any value, should clearly discriminate between the quantity of silica in the soluble and in the insoluble form. Soluble silica in the form of clay, slag, scoriæ, pozzuolana, &c., confers hydraulicity. The other variety or sand, quartz, flint, &c., does not. If a fat lime be mixed with clay in proper proportions, the mortar so formed will be hydraulic.

Magnesium carbonate also possesses hydraulic properties, reducing the energy of slaking and increasing the power of setting. When 30 per cent. of Hy Co_3 is present, lime is rendered hydraulic without the presence of clay.

Alkalies and metallic oxides assist hydraulicity if the heat of calcining is not raised too high. In fact the temperature of calcining is a very important factor in determining the hydraulicity of the lime or cement produced. It must not be forgotten that the presence of oxides of the metals lower the point of fusion of a limestone. Pure silica is an infusible substance, but when mixed with metallic oxide fuses very readily, combining with the metal present.

Fat limes are produced by calcining the purest form of calcium carbonate, that formed by calcining white marble being the purest. It is to be noted that the chemical composition and not the physical structure of the stone determines the quality of the lime, chalk and marble producing the same lime. Neither do fat limes produce the best mortar, in fact, a fat lime ought never to be used in exposed work. Poor limes contain from 60 to 90 per cent. Ca Co_3 with inert substances, as sand, which have no chemical action. Such limes may be used and made hydraulic by mixing with clay.

Hydraulic limes contain from 70 to 90 per cent. Ca Co_3 combined with clay or Ca CO_3. The hydraulicity of such limes increases with the increase in the quantity of clay present up to a certain point. It is found that the hydraulicity is greatest when the limestone contains 30 per cent. of clay. When the amount of clay becomes greater than this the mortar becomes less hydraulic.

Before I speak of the chemical action that takes place in the setting and hardening of hydraulic limes which depends on a different reaction to what takes place in the hardening of ordinary mortar, I will say a few words as to cements. Cements are in many respects similar to hydraulic limes. Natural cements are calcined from limestones containing from 20 to 40 per cent. of clay. A typical example of natural cement is that known as Roman cement, which is made by calcining nodules which occur in the London clay. These nodules contain 30 to 45 per cent. of clay, and are calcined at a low temperature. Cement differs chiefly from hydraulic mortars by not slaking with water. It sets to a far denser substance, and shrinks only very slightly on drying. The best known of the artificial cements is the so-called Portland cement, which is made by mixing chalk and clay with water to a creamy consistency, which is allowed to dry, then calcined at a temperature short of vitrification and ground to fine powder. The clay and chalk are mixed in such proportions that the resulting cement shall contain 20 to 25 per cent. clay. You have noticed that Roman cement is calcined at a low temperature and Portland cement at a higher one. The temperature at which a cement is calcined depends upon the proportion of silica to the other ingredients. A large proportion of alumina and iron in proportion to the silica causes the fusion of the mass at a comparatively low temperature. Portland cement, which contains a large excess of silica, can be calcined at a high temperature without vitrification. The following are the principal reactions that take place when cement is calcined at different temperatures:—

At a low temperature the carbonic acid is driven off, and the silica combines with the lime, but not with the alumina, hence if the stone is rich in clay the whole of the lime is converted into carbonate silicate. If there is little clay present the whole of the lime present is not converted into silicate, and the result is that the product of calcination contains quicklime. This explains the difference in slaking off ordinary mortars, and hydraulic mortars and cements. Ordinary mortars containing no clay, the product is more or less pure quicklime, which slakes, as you have seen, with great energy. Hydraulic mortars contain up to 30 per cent. clay, which produces sufficient silica to convert the greater portion of the lime into silicate on calcining. A portion of unchanged quicklime is, however, left, hence such limes have a feeble slaking action. Roman cement, which we take as an example of a cement burnt at a low temperature, contains 30 to 45 per cent. of clay, which you remember is a silicate of alumina. The whole of the lime is converted into silicate, and the product contains no free lime. When the

* A paper by Mr. F. B. Guthrie, F.C.S., Demonstrator of Chemistry at the Sydney University, read at a meeting of the Sydney Architectural Association.

stone is calcined at a high temperature, a further action takes place between the lime and the alumina, which combine to form aluminate of lime, in addition to the silicate of lime. Further reaction takes place, which results in the formation of a double silicate and aluminate of lime. That is a substance in which lime is combined with both silica and alumina. Now, both these substances, aluminate of lime and the double silicate, possess the property of becoming hard when mixed with water, and independent of the action of the air. The result is, therefore, a cement of great strength. This further explains why Portland cement should be burnt at as high a temperature as possible. Portland cement contains only from 20 to 25 per cent. clay. If this were only moderately calcined the result would be a hydraulic lime, which would slake slightly, and the hardening would not take place simultaneously, the result being a tendency to blow. The higher temperature is used to insure the formation of aluminate of lime and the double silicate and aluminate. The setting and hardening of cements is due to other causes than in the case of mortars which harden by absorbing Co_2. The water acts by allowing the silicate and aluminate of lime to combine with each other to form hydrated silicates, which set by crystallising. There is another class of cements which set by reason of absorption of water, namely, those of which $Ca\,So_4$ is the basis. $Ca\,So_4$ occurs in the tertiary deposits in nature in two or three modifications, as selenite $+ 2H_2O$ in transparent prisms, as gypsum $2H_2O$, and alabaster in opaque or semi-opaque masses. In these forms it is combined with two molecules water, third as anhydrite, which is anhydrous $Ca\,So_4$.

When gypsum is heated at a moderate temperature as high as 120°, it parts with its water, and is known as plaster of Paris. This substance readily re-absorbs the quantity of water which has been driven off, and becomes hard and sets in the process. It also expands slightly in setting, which makes it exceedingly valuable for taking casts of coins, medals, &c. When the gypsum is heated to 200° it becomes hard-burnt, that is, it absorbs water very slowly and does not harden. If it be heated to a still higher temperature to 500° it absorbs water very slowly, the absorption not being complete at the end of several weeks, but it then sets to a very hard alabaster-like mass.

Sulphate of lime is soluble to some extent in water, hence such plasters do not bear exposure to the weather, but are used largely in internal work as coatings to walls and ceilings, their quick-setting and drying properties making them very valuable materials. When plaster of Paris is mixed with certain salts, as alum and borax, they set into a harder cement. Examples of such cements are Keene's cement containing alum ; Parian cement containing borax ; Martin's containing potash carbonate.

With regard to the testing of cements, you will learn more from a visit to cement works, where these tests are constantly employed, than from anything I can tell you. The weight is of importance. This varies from 95 to 130 lbs. per striked bushel, and should be so finely ground that 80 per cent. of it passes through a sieve containing 2,500 meshes to the square inch. A heavy cement sets more slowly, but becomes harder, and is more likely to be thoroughly burnt throughout. The tensile strength is of the greatest practical importance, and is ascertained by moistening the cement with water, and introducing it without pressure into a mould shaped like an hour-glass, and allowing it to dry. The briquettes thus formed are allowed to remain for varying periods in water and in air, and are then placed in a proper testing machine, and the weight noticed at which they break. The briquettes are formed so that the waist—the point where they break is 1½ by 1½—is 2½ square inches. The strength required varies, of course, under different contracts, and according to the work required. The Metropolitan Drainage Works required that the briquettes, after being immersed in water seven days, should bear a weight of 350 lbs. per square inch, *i.e.* 787 lbs. in the briquette area. It is usual to test them after seven days' immersion ; a longer immersion, however, would give a far higher breaking power, and such cement as the above would bear 450 lbs. to the square inch after thirty days' immersion. The chemical analysis of a cement is rather tedious, but does not present any particular difficulties. It is important in such analysis that the distinction should be clearly marked between silica in the form of sand, flint, &c., in which condition it is inert and in the form of clay, to which the mixture owes chiefly its hydraulicity.

Iron.—This most important metal is very rarely found native. Its most important ores are oxide or carbonate. As oxide it occurs as magnatite or magnetic iron ore $Fe_3\,O_4$, as specular iron ore or hæmatite $Fe_2\,O_3$, and brown hæmatite $(Fe_2\,O_3)\,(H_2\,O)_3$. As carbonate it occurs as spathic iron ore, which is nearly pure ferrous carbonate. Clay-ironstone is ferrous carbonate, mixed with clay and other mineral substances. Black-band is ferrous carbonate, containing bituminous matter. The ores are usually roasted, to remove volatile impurities, before being introduced into the furnace. In the blast furnace, which is a gigantic structure 50 to 80 feet high, the ore is introduced in alternate layers with coal or coke mixed with limestone. Hot air is forced in at the bottom, to assist the combustion of the coals ; carbonic acid and steam pass up along with the hot air, and, coming in contact with the white hot carbon of the coal, are reduced to CO and H. When the ore introduced at the top has descended sufficiently to be heated by the mixture of N CO and H, it becomes converted into spongy iron. The spongy iron descends, mixed with the clay and limestone, to the hotter parts of the furnace, where the iron combines with C to form a carbide of iron, while the lime unites with the silica and alumina to form a slag. The iron sinks through the slag, or is run off by means of a clay plug. In addition to the carbon, the iron in the molten state takes up silicon, phosphorus, sulphur. This mixture of iron with C Si PS is known as pig-iron—an impure form of cast-iron. Liquid iron takes up about 5 per cent. C., forming a compound of the composition F_4C. When the iron is rapidly cooled a white crystalline mass is obtained, known as white iron. When cooled slowly some of the carbon crystallises out in scales, and the iron has a grey or mottled fracture from particles of C. When white cast-iron is dissolved in HCl no C is left. When grey cast-iron is dissolved C is left behind, the explanation being that the C in grey iron is not combined with Fe, and is not attacked by H, whereas the C in white iron is chemically combined with F and is attacked by the H forming hydro-carbon. White iron fuses more readily than grey. The specific gravity of cast-iron varies from 7 to 7·25, sometimes higher. The lighter varieties are inferior, both as regards tenacity and stiffness, to the denser, hence the readiest way of judging the strength of cast-iron is to take its specific gravity. Large and massive castings are not so strong as smaller castings of the same materials, the reason being that in the gradual cooling the mass forms into large crystals. This is obviated to some extent by using an iron mould, which chills the surface and makes it cool rapidly.

Malleable and wrought-iron is made from pig in the following manner :—The pig is melted in a shallow hearth in a reverberatory furnace ; air is forced into the molten mass by twyers. The effect of the passage of air is to oxidise the Fe, forming a skin of ferric oxide. This is called fine iron. It is then puddled. This is stirred about ; the C is thus burnt out partly by the oxygen of the air and partly by the ferric oxide, the liquid mass gradually becomes pasty, and is ultimately removed in balls or "bloom" by means of the stirrer. This process is known as puddling. The balls are then hammered under a steam-hammer to squeeze out the slag and impurities. It is further refined ; the main difference between cast and wrought-iron consists in the quantity of carbon. Bessemer's process of decarbonising cast Fe is to blow air rapidly through melted cast-iron contained in a clay pot. Great heat is evolved, and the N and Co evolved keep the mass in constant agitation.

Steel is manufactured by the Bessemer process by burning out all the C and Si in cast-iron as in the manufacture of wrought-iron, and the adding of sufficient spiegeleisen, a variety of cast-iron very rich in C and containing 5 per cent. manganese. Cast-iron contains about 5 per cent. C. Wrought-iron contains 0·15 to 0·5. Steel contains from 1 to 2 to 3 per cent. Steel is also manufactured by the cementation process, by which plates of soft iron are arranged in a stoneware box, with alternate layers of charcoal, the whole closed and heated for several days at a bright red heat. By this means carbon is converted into CO, which penetrates the iron giving up C and becoming CO_2. This CO_2 is again reduced by the charcoal, and forms CO. The steel thus obtained is called "blister steel," and contains about 1·5 per cent. of C. It is covered with blisters from the escape of gas, and is not of uniform texture. It is then fused in crucibles of clay and plumbago and cast into moulds. This is known as cast-steel. Shear-steel is blister-steel treated as in the manufacture of wrought-iron. Steel is especially valuable for its elastic properties. It can be hardened by the process of tempering, *i.e.* by suddenly cooling down from a high temperature, and again softened by re-heating and cooling slowly. Case-hardening is a rapid process of cementation. The rim is heated and sprinkled with carbonaceous matter containing N, as horns, leather or bone. The iron is heated to redness, and the powdered substance sprinkled over it. When thoroughly cooled the surface is found to be hard enough to resist the file. The reaction is the same as in the cementation process. Both wrought-iron and steel may be made directly from the ore by the Catalan forge, in which ore is reduced by C, slag run off, rolled and hammered.

The rusting of iron is brought about by exposure to the combined action of air, H_2O and CO_2, the ferrous carbonate formed being converted into ferric oxide, and subsequently into ferric hydrate. Iron may be protected by painting or by coating with magnetic oxide. This process, known as Barff's, and improved by Bower, consists of passing superheated steam over red-hot iron. The iron combines with the oxygen of the steam and coats itself with a black magnetic oxide of iron which resists further action and will not rust. The disadvantages are that large castings cannot be conveniently raised to a high temperature. The method is very good for small castings, especially those of an intricate nature.

NOTES AND COMMENTS.

IT has been arranged that the sketch models for the memorial of the Emperor FREDERICK, which is to be erected on the battle-field of WÖRTH, are to be sent to the Academy of Arts in Berlin not later than April 1, 1892. They are to be distinguished by mottoes. The memorial is to stand upon the hilly ground on the spot where the Crown Prince watched the operations of the armies. There is to be an equestrian figure of the Prince, who is to be represented in the uniform he wore on the day of the battle. The pedestal will bear reliefs which are to indicate the union of troops from various divisions of the empire in the struggle to win back Alsace for Germany. The principal figure and reliefs are to be in bronze. The sum assigned for the sculpture and pedestal is 200,000 marks. The models are to be exhibited in Strasbourg as well as in Berlin, and in the final arrangements the Statthalter of Alsace will have a voice with the Emperor. The jury will consist of Dr. SCHÖNE, director of the Berlin Galleries; Professor VON WERNER, of Berlin; Dr. ROHDEN, of Hagenau; Professors ENCKE and BEGAS, of Berlin; Professor RÜMANN, of Munich; and Professor DIEZ, of Dresden. The authors of the three models which are placed next in merit to the approved design will each receive 4,000 marks. Evidently it is the desire to give an Imperial character to the memorial, and therefore all German sculptors are eligible to compete.

THE Oswestry Municipal Buildings will be carried out under the direction of Mr. T. M. LOCKWOOD, of Chester, who has acted as adviser of the Council in the arrangements of the competition. In a letter on the subject, Mr. LOCKWOOD says:—"I think it is best to name a sum for architect's fees, and not in the present instance to work on commission. I am willing to undertake the drawings, specification, details and superintendence for the sum of three hundred guineas, travelling expenses to be the amount only paid out of pocket. As I explained, the whole of the plans, elevations, sections and details will have to be redrawn, as practically all I have is the arrangement of plan only, and I would suggest certain slight modifications of the character pointed out to you, a sketch of which I will bring over in a few days." Mr. LOCKWOOD'S offer has been accepted by the Town Council.

AN American artist, Mr. F. B. CARPENTER, has painted a large picture of the meeting of the representatives of Great Britain and America in order to settle amicably the dispute over the *Alabama* affair. The Americans who appear are Mr. HAMILTON FISH, Judge NELSON, General SCHENCK, Judge HOAR, Mr. WILLIAMS and Mr. BANCROFT DAVIS. The English representatives are the Marquis of RIPON, Sir STAFFORD NORTHCOTE, Sir EDWARD THORNTON, Sir JOHN MACDONALD, Professor MONTAGUE BERNARD and Lord TENTERDEN. The painting has been purchased by Mrs. W. W. CARSON, of Dalton, Mass., for presentation to the Queen, who has agreed to accept the work.

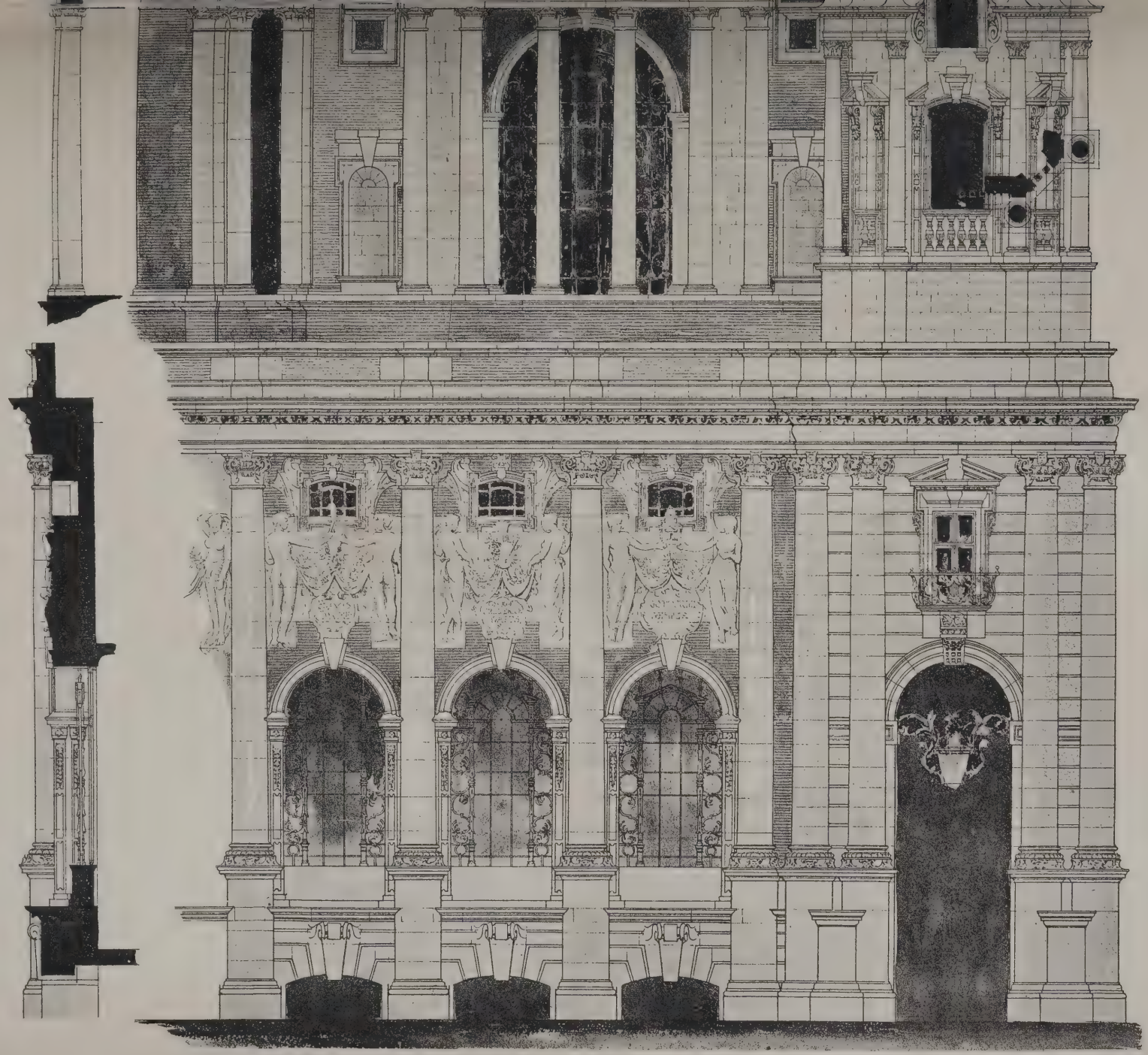
THE fifth general meeting of the Royal Society of Antiquaries of Ireland was held in Dublin on the 10th inst., when the great and most successful labours of Mr. ROBERT COCHRANE, the honorary secretary, found due recognition. It is not easy for a stranger to realise the difficulties which are before anyone who endeavours to unite Irishmen, who by destiny are made to be at variance with one another, in admitting that any work deserves their co-operation. But this feat has been accomplished by Mr. COCHRANE, with a result that might be called miraculous. Archæology was becoming a sort of isolated study in Ireland that was to be pursued in secret, and in consequence there was a risk of fads being taken as infallible principles. The new Society has brought about a change, and not only are students of archæology willing to submit their conclusions to discussion, but men of all creeds and parties are not afraid to meet in public and explore uninhabited districts together. It is gratifying to know that so salutary a revolution is brought about by the zealous exertions and disinterestedness of an architect, and our readers will be glad to learn that Irishmen can appreciate the devotion of Mr. COCHRANE to a good cause. At the meeting that appreciation assumed a triple character, as if suggested by the national symbol. The president, Lord JAMES WANDESFORD BUTLER, D.L., and members of Council, presented Mr. COCHRANE with a handsome and costly writing cabinet, in acknowledgment of his services as editor of the *Journal*; the members of the Society joined in offering an illuminated address, bound in album form in the most artistic fashion. The third gift was from the older members of the Society, who were the best judges of Mr. COCHRANE'S services, and consisted of a service of silver plate, which was made from special designs for the occasion. It must be satisfactory to Mr. COCHRANE to find that his skilful guidance of the Society through many difficulties is remembered, and the presentation can be considered as no ordinary ceremony in a country like Ireland, where gratitude is rendered only for political services.

PERIODICALLY since 1863 international exhibitions promoted solely by artists have been held in Munich. Next year the sixth of the series is to be held. The preliminary arrangements have been completed so far as the election of committees. The majority of the members are painters, for they have the public on their side in all questions relating to exhibitions, but there are also some architects and sculptors. The president of the central committee is Herr EUGEN VON STIELER, and Herr ALBERT BAUR is secretary. Professor ALBERT SCHMID is president of the building commission. The preceding exhibitions were opened on July 1, but next year the opening day will be a month earlier. The closing will be on October 31. Communications about works for exhibition must be sent before March 15, and works will not be received after April 15. The Prince Regent has promised the patronage of the actual head of the State, and Prince LUDWIG will act as honorary president. The Governments of Belgium and Holland have already signified their co-operation, and have appointed representatives.

FOUR examples of Florentine sculpture in stucco, in which the various parts are coloured, have been acquired for the Louvre. Polychrome sculpture is generally considered to be made up of materials of different colours, and the *Minerva* of PHIDIAS was probably an early example. FALCONET, the French sculptor, when writing on the subject, says that if employed with intelligence, materials of a variety of colours can be combined in such a way as to produce some picturesque effects, but generally the result is disagreeable. While admitting that sculpture is best when all parts are of one colour, the love of liberty among the Italians of the Renaissance, and the desire to puzzle posterity, did occasionally tempt them to continue the Gothic traditions, and paint both figures and draperies. Polychromy was admired by VEROCCHIO, CARADASSO, RICCIO, BENEDETTO DA MAJANO, and it is supposed that JACOPO SANSOVINO also painted his statues. Works in terra-cotta and in wood were often coloured, although from a great many examples the colours were subsequently removed to satisfy the change in taste. Painters also worked on the sculpture of their friends. LORENZO DI CREDI and COSIMO ROSSELLI helped in that way. The process of painting continued until the sixteenth century, for records remain of commissions for figures in terra-cotta for Italian churches, which were specified to be coloured with oil paints and gold laid on in some parts. The practice must have prevailed in SHAKESPEARE'S time, for the figure of HERMIONE ("by that rare Italian master GIULIO ROMANO"), in the "Winter's Tale," was not intended to counterfeit a white marble statue, although of late years actresses and stage-managers will endeavour to deceive LEONTES and the spectators by an approximation of a plaster cast that coldly stands on a pedestal. For the veins are supposed to look as if blood coursed through them, the lip was warm with life, and the King was not allowed to kiss the face, because, as he was told, "You'll mar it if you kiss it; stain your own with oily painting." Unfortunately in England there is no place to display Renaissance sculpture, and as the polychrome variety is only to be known through books the mode of treatment is considered to be a relic of barbarism.



PLAN OF DOME.



INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET. FETTER LANE, E.C

DESIGN FOR THE COMPLETION OF THE SOUTH KENSINGTON MUSEUM. (Motto: "Prince Albert.")



INK-PHOTO SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



INK-PHOTO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.


Public Room
Reading Room
Secretary
Ground Plan



INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE, E C

HAMPSTEAD LIBERAL CLUB.

Messrs. SPALDING & CROSS, Architects.

ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 445.—DESIGN FOR COMPLETION OF SOUTH KENSINGTON MUSEUM:—DETAIL. [JOHN BELCHER.]

NEW LIBERAL CLUB, HAMPSTEAD.

IN this building the accommodation provided for the members comprises the ordinary requirements of a club-house, and includes billiard and bagatelle, card, smoking and reading-rooms; and, in addition, there is on the ground-floor a large public room, available for political meetings, concerts, &c., and capable of seating from 150 to 200 persons. The building was erected by public subscription, at a cost of about 2,600*l.*, and much credit is due both to the building committee and to the indefatigable treasurer, Mr. B. A. LYON, for bringing the undertaking to a successful issue. The fronts are faced with red bricks and Ancaster stone, and the roofs are covered with green slates. Messrs. ALLISON & FOSKETT, of Hampstead, were the builders, and the architects, whose design was selected in competition, were Messrs. SPALDING & CROSS, of 15 Queen Street, E.C. The club-house was opened on June 14, 1890, by the Marquis of RIPON, K.G. Our illustration is taken from the architects' drawing exhibited in this year's Royal Academy exhibition.

PALAIS DE JUSTICE, ROUEN.

THE Salle des Procureurs of the Palais de Justice at Rouen dates from 1393, but the other parts were erected by LOUIS XII. in 1499, some say in 1504, as a Court of Exchequer—an institution that led to the Normandy Parliaments, in which popular rights were protected. The building generally known as the Palais forms one side of a square, and adjoins the Salle. The hall, or Grand Chambre, is one of the finest in France. FRANCIS I. in 1517 dwelt in the Palais, and it was in the register described as "sompteux et de grand coût." In the course of the centuries the building underwent changes, and in 1812 a part fell down. Credit must be given to M. GRÉGOIRE for the care with which he restored the Palais. The lower windows of the central tower, shown in the illustration, he found with square heads, and, in fact, there was a medley of incongruous and beautiful detail. The illustration is a reproduction of a drawing by Mr. A. MCGIBBON, of Glasgow, that was exhibited this year in the Royal Academy.

BANKING PREMISES FOR A COUNTY TOWN.

THIS illustration is taken from a drawing by Mr. ALBERT BREDEN, which was exhibited in the last exhibition of the Royal Academy.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fourth ordinary meeting of the Institute of Architects was held on Monday evening, Mr. J. MacVicar Anderson, president, in the chair.

The PRESIDENT announced that under by-law 20 the following had ceased to be members:—Messrs. A. Young, C. L. Cadney, J. Mossop and C. E. Powell.

Examinations.

The PRESIDENT stated that in preliminary examinations held last month in London and Manchester sixty candidates passed, inclusive of twenty-one who were exempted; these were now qualified as probationers. Nine were relegated for further study. For the intermediate examinations in London and Manchester twenty-three passed and four were relegated. In the examination for architecture qualifying for Associateship twenty-six passed out of forty and fourteen were relegated. Of the twenty-six Mr. John Begg was pronounced as having most highly distinguished himself, and was deserving of the Ashpitel medal. Mr. Owen Fleming, London, came next, followed by Mr. John William Twist, of South Shields.

A paper was then read by Mr. Horace Townsend, of New York, of which the following is an abstract, on

American Theatres.

Mr. TOWNSEND, in his introductory remarks, said that having been, during twelve years' residence in the United States, four years a practising architect and the remainder a dramatic critic and writer, he had had exceptional advantages for studying the American theatre. He expressed, though, the diffidence with which he ventured to read a paper on the subject before architects who had more knowledge of theatre building than he pretended to have, and many of whom had erected them. The theatre, he said, was, as now understood, a comparatively modern institution, and less hampered by precedent or tradition than most public buildings; but certain influences caused all theatres to present a family likeness, though the features offered points of difference. It was a curious fact that the American theatre-type followed the French in having no pit, although the theatre in America had, from a historic point of view as well as an architectural one, generally followed England rather than France.

It was not until the middle of the last century that a permanent theatre was established even in New York, and, as far as could be judged, it was not unlike one of the smaller London playhouses of the same epoch. A generation or so ago, however, the Americans had become a theatre-going people, and theatres of pretensions such as the Old Bowery, the Academy of Music, and Walleck's were built, following the English model with one important exception—the pit. It was, he thought, the inherent democracy of the people which led to the planning of the theatre with its "pit" (a term unknown in America) on the ground-floor level, and to the abolition of all boxes save the four on each side of the proscenium. In every case the theatre, even at that date, was conceived on a simple and sensible plan, viz. an oblong block divided in three parts transversely, of which the largest was in the middle occupied by the auditorium; the second in size at one end devoted to the stage, while the third was again divided into three parts by lines parallel to the greatest length of the oblong, the central spaces being devoted to the main entrance, which thus led directly from the street to the auditorium, and in the space on either side were the means for ascending to the higher portions of the house. The very latest American theatres were planned more or less on the same broad lines, but for some score or so of years the theatres erected afforded very few points of difference, many being built from one set of plans. During the seventies, however, a great influx of theatre-building took place, but it was not until the close of that decade that a small theatre erected in New York introduced a new era of American theatre architecture. The Madison Square Theatre, presenting many original points, was the outcome of the talents of more than one man. Two brothers named Mallory provided the funds; an actor and manager, one Steele Mackaye, a portion of the ideas; and two clever young architects, Francis H. Kimball and Thomas Wisedell (an Englishman), the professional skill which put the theories into practice and materially improved upon them. Though the old form of horseshoe balcony or gallery, with the floor sloping upwards on one plane, offered excellent opportunities of hearing, people seated at the sides had a limited view. These architects obviated this difficulty, and gained a fairly large seating accommodation in an auditorium of limited capacity by sloping the main floor uniformly upwards from the stage, which was raised but slightly above the level of the auditorium, and each row of seats on the main floor was raised about 4½ inches above the one immediately in front. The balcony above this main floor was very deep, approaching in its centre much closer to the proscenium line than usual, but instead of the horseshoe curve the front was twice broken abruptly in its outline, being in the centre a little flatter than semicircular, with the sides of an ogee form. Other details of the Madison Square Theatre were then given by Mr. Townsend, notably the arrangement of a double stage, the ventilation and warming of the auditorium, the picture-framed proscenium and the overhead orchestra. Although the theatre was very successful, the practical good sense characteristic of the American people prevented a slavish imitation of it. Certain points not being found wholly successful were discarded, but the heating and cooling apparatus and the seat arrangements were in the main followed by subsequent designers.

The author then proceeded to point out the salient points of difference between the ordinary theatre in New York and London, taking as an example of the former the Madison Square Garden Theatre (not the building above referred to), and of the latter, Terry's Theatre. The Madison Square Garden Theatre was chosen by him as one of the first built under the new building laws, Terry's being also selected as of recent date. A noticeable difference was the greater space devoted to the stage and auditorium in the American theatre, though land was as a rule dearer in New York than London, and rentals higher, while the population was less than half of that in London. Then the great simplicity of arrangement—the main floor devoted to seats of one character, and entered almost directly from the street; the balcony seated in the same homogeneous way, and reached by a broad and direct staircase; and the readier accessibility of the dressing-rooms, some of which open practically on to the stage, and none of them being below the level of the street: a point to be by no

means overlooked. As regards the warming and ventilation, the author was almost inclined to sum up the difference between the two countries by saying the Americans heated and ventilated their theatres as well as cooled them in the summer, while the English did not; but he thought that might be beyond fair criticism. Certain it was that in all the later theatres in America ventilation was as nearly perfect as might be.

Mr. Townsend dealt next with several other theatres in New York, giving a description of each, among them the following:—The New York Casino, by Messrs. Kimball & Wisedell, one of the most beautiful theatres he knew of; Palmer's Theatre, the Metropolitan Opera House, the Broadway Theatre, the Lyceum, the new Fifth Avenue, Mr. Hammerstein's Opera House, and Harrigan's Theatre. Though he had intended to be silent on the subject of decoration, he could not refrain from adding that London had no theatres that could be compared with the Metropolitan Opera House, the Lyceum, the Madison Square, or the Madison Square Garden in that respect; each was distinctly individual and original, and distinctly pleasing in effect. Of other theatrical centres in America, Philadelphia possessed few theatres calling for remark. Chicago, now that McVickar's was burned down, principally the Auditorium, which was a truly American building, called a theatre, and on occasions serving the purpose of one; in point of fact, it was an enormous hall, designed chiefly for great musical festivals and political conventions. The stage was most marvellous. It was worked by hydraulic pressure, and was divided into sections of a few square feet in area, each of which could be raised or lowered independently of its neighbours by touching a button. No borders were used, but sky effects produced by a species of domed panorama. In Boston the author referred to the Boston Museum, the Boston Theatre, the "Tremont," and the Grand Opera House, which was illustrated by working drawings, lent by Mr. N. B. Goodnow, the owner, and described in detail. Mr. Townsend held it was characteristic of the American client to consider that the best was the cheapest in the long run, and to this was greatly due the growth of a healthy and advanced architectural school in the United States; and perhaps also it was on this account that the New York Building Law was adopted without question or murmuring. The Law was founded upon that of Vienna, and some sections referring to theatres were given by the author in considerable detail.

Mr. C. J. PHIPPS, F.S.A., in proposing a vote of thanks to Mr. Townsend, said there was much in the paper he did not agree with. The difference of planning theatre areas in America and England seemed to be chiefly one of name, the "parquet" corresponding to the English pit and stalls, except admission to the whole area was at one price, an arrangement which would not be popular here. The planning of the general area on the street level, spoken of as an improvement, was not unknown here, but most theatres being three tiers in height, by making the lowest level lower than the street, the number of stairs to the gallery was reduced. The idea of enclosing the stage in a frame was not a novel one, as he had introduced that feature in his reconstruction of the Haymarket at Mr. Bancroft's request, but he did not like the effect, and had since removed it. There was much in what Mr. Townsend had said about the ventilation of London theatres, but the managers could not afford the expense of more perfect arrangements.

Mr. T. BLASHILL seconded the vote of thanks, which was supported by Professor KERR, and on being put to the meeting was carried by acclamation.

Mr. TOWNSEND, in the course of his reply, stated the great difference between English and American theatres was that in the latter the greater portion of the house was seated at one price at about the street level, dispensing with the use of narrow and winding staircases.

MANCHESTER ARCHITECTURAL ASSOCIATION.

OWING to the fusion of this Association with the Manchester Society of Architects, the members met together at dinner for the last time at the Grosvenor Hotel, Manchester, on Tuesday. The toast of "The Royal Institute of British Architects" was proposed by Mr. J. S. Hodgson, and responded to on behalf of the Institute by Mr. Lawrence Booth, F.R.I.B.A. Testimonials were then presented by the Chairman (on behalf of the members of the Association) to Mr. A. H. Davies-Colley, A.R.I.B.A., and Mr. J. D. Mould, A.R.I.B.A. Mr. Davies-Colley has been treasurer of the Association ever since its formation (a period extending over sixteen years), and Mr. Mould has acted as hon. secretary for the past six years. The healths of both gentlemen were given with musical honours, and they responded. The toast of "The Past Officers of the Association" was proposed by Mr. T. Cook, and responded to by Mr. Frank W. Mee. "The Success of the Newly-constructed Manchester Society of Architects" was proposed by Mr. A. H. Davies-Colley, and responded to by Mr. P. E. Barker, A.R.I.B.A. The toast of "The Chairman" was then given and responded to, and the proceedings terminated.

THE ROYAL ACADEMY PRIZES.

THE prizes in the schools of the Royal Academy during the year have been awarded as follows:—Historical painting—*Victory*, gold medal and travelling studentship (200*l.*), Ralph Peacock. Landscape painting—*And now the sun had stretch'd out all the hills, and now was dropp'd into the western bay* (Milton's "Lycidus"), Turner gold medal and scholarship (50*l.*), Francis Joseph Mackenzie. Landscape painting—*An English Lane*, Creswick prize (30*l.*), Emily Louisa Long. Painting of a figure from the life (open to male students only)—silver medal, 1st, George Spencer Watson; 2nd, Reginald Arthur. Painting of a head from the life—silver medal, 1st, Henry Lawrence Dell; 2nd, Gerald Edward Moira. Painting of a draped figure (open to female students only)—silver medal, 1st, Helena Maria Swaffield. Cartoon of a draped figure—*Mark Anthony showing Cæsar's Mantle to the People* ("Julius Cæsar," act. iii. sc. 2), silver medal and prize (25*l.*), Herbert Arthur Horwitz. Design in monochrome for a figure picture—Saul hurling the Javelin (Sam. xix. 8, 9, 10), Armitage prizes, 1st (30*l.*) and bronze medal, Paul Raphael Montford; 2nd (10*l.*), Marion Clarkson. Design for the decoration of a portion of a public building—St. Augustine preaching Christianity in England, prize (40*l.*), Paul Raphael Montford. Set of six drawings of a figure from the life (open to male students only)—1st prize (50*l.*) and silver medal, George Spencer Watson; 2nd (25*l.*), Francis Joseph Mackenzie (disqualified owing to having received the same prize before); 3rd (15*l.*), Lawrence Edward Koe; 4th (10*l.*), Gerald Edward Moira. Drawing of a head from the life—silver medal, 1st, Lewis Christopher E. Baumer; 2nd, Katharine Mary Willis. Drawing of a statue or group—silver medal, 1st, Katharine Mary Willis; 2nd, Evelyn Caroline E. Pyke-Nott. Composition in sculpture—Jacob wrestling with the Angel (Gen. xxxii. 24, 25), gold medal and travelling studentship (200*l.*), Paul Raphael Montford. Set of three models of a figure from the life—1st prize (50*l.*) and silver medal, Andrea C. Lucchesi; 2nd (20*l.*), Paul Raphael Montford. Model of a design—"Joy," 1st prize (30*l.*), Andrea C. Lucchesi; 2nd prize (10*l.*), Paul Raphael Montford. Model of a bust from the life (open to female students only)—silver medal, 1st, Jane Adye Ram; 2nd, Edith Bateson. Model of a statue or group—silver medal, 1st, Edith Bateson. Design in architecture—design for a large town house, planned with a view to the proper placing and lighting of pictures, sculpture and other works of art, but not to contain a picture gallery—gold medal and travelling studentship (200*l.*), Alfred Henry Hart. Set of architectural drawings—Hanover Chapel, Regent Street, silver medal, 1st, Francis Edward Ward. Set of architectural designs (upper school)—prize (25*l.*), Alfred James Edwards. Set of drawings of an architectural design (lower school)—prize (10*l.*), Henry Ernest Kirby. Plan of a building, a public library—prize (10*l.*), Henry Ernest Kirby. The Landseer scholarships in painting and sculpture of 40*l.* a year each, tenable for two years, given for the best work done in the examination for passing into the second term of studentship, have been awarded—in painting, to Gerald Edward Moira; in sculpture, to Paul Raphael Montford.

DISCOVERIES IN CHESTER.

A MEETING of the Lancashire and Cheshire Antiquarian Society was held in the Mayor's Parlour at the Manchester Town Hall on the 11th inst., when a paper was read by Mr. E. F. Benson, of King's College, on the Roman remains discovered at Chester during the recent excavations. He said the excavations had been going on since September under the charge of the City Surveyor of Chester. The results so far had been very good. A piece of the east wall had been opened and a number of interesting tombstones had been brought to light. The Roman military tombstones hitherto found in Chester were tombstones of men belonging to the Twentieth Legion. But the tombstones recently discovered belonged to the Second Legion (*adiutrix*). They were more weather-worn than the tombstones of the Twentieth Legion, and on that account and for other reasons they were supposed to be of earlier date. In all there were ten of these tombstones. The legion in question was in Britain for less than thirty years during the latter half of the first century, and his theory was that it took the place of the Twentieth Legion at Chester while that legion was absent in Scotland with Agricola. Photographs of a number of the tombstones were shown on a screen. The tablet on which the inscription was placed is round at the top, and not square, as is the case of the tomb-

stones of the Twentieth Legion, and the inference was that round tops were the fashion at the time the Second Legion was at Chester, and that the square top came in later. The inscriptions gave various particulars with regard to the deceased, such as their names, ages, the years they had served, their place of birth, and usually a word or two in praise of their career. Mr. Benson afterwards discussed at length the rival theories as to the origin of the wall—the one that the stones are Roman but that the wall was not built by Roman hands, and the other that the wall was Roman *in situ*. The latter was the view he supported. In concluding, he said there was plenty of work still to be done, and expressed the hope that it would not be stopped for want of the money necessary to carry it on. A vote of thanks was passed to Mr. Benson for his paper.

Professor Boyd Dawkins said there was the clearest proof that the original buildings of Manchester were the work of the Roman Legion whose headquarters were at Chester, so that the history of Chester was to a large extent connected with that of Manchester. He was sure that considerable light would be thrown upon the Lancashire Roman period by the inquiries which were being carried on at Chester, and which he hoped would be continued.

MUNICIPAL BUILDINGS, BATH.

A SPECIAL meeting of the Town Council was held on Friday last to consider the question of providing a new municipal building for Bath, the present structure having become altogether inadequate to meet the existing needs. A report was presented recommending the adoption of the plan sent in bearing the motto "Adelphi," for the construction of a building at an estimated cost of 22,500*l*., which, together with other expenditure, would necessitate a loan of 35,000*l*. being acquired. The Council discussed the subject at some length, and eventually adopted the committee's report. The Town Clerk announced that the author of the accepted plan was Mr. J. M. Brydon, London, who received the first premium of 100*l*., the other premiated plans being those sent in by Messrs. Burgess & Oliver, London, who received 75*l*., and Mr. T. B. Silcock, of Bath, 50*l*.

TOTNES TOWN HALL.

THE Town Clerk of Totnes has explained the alleged vandalism by pulling down the ancient Grammar Schoolroom adjoining the Guildhall. He says that the building in question has been rebuilt and remodelled from time to time until the whole of its ancient character long since disappeared, except that in a cellar beneath it can be traced a portion of the old walls of the town; and that the present modernised building is not to be pulled down, but simply remodelled for use as a police-station, the cellar and remains of the ancient town wall not being interfered with. The building in question was the property of the Totnes Endowed School Governors, and on new premises being acquired for the school it was sold to the Town Council, who in turn sold it to the County Council for Devon, whose joint committee are making the alterations; so that the Conscript Fathers of Totnes are not responsible for the way in which the alterations are to be carried out. As to the suitability of the building for the purpose to which it is to be put, the joint committee of the County Council consider it most suitable, and the Home Secretary approves it.

THE ARCHITECTURAL ASSOCIATION.

THE fifth ordinary meeting of the Association was held on Friday evening, Mr. F. T. Baggallay, president, in the chair.

Mr. T. G. JACKSON read a paper on the

Training of Architects.

Mr. Jackson said:—When you asked me to address you this evening on some matter connected with our common calling, it seemed to me that I could not do better than choose for my subject that of the training of architects to the pursuit of architecture. It is a subject about which more has been said and written of late years than at any time before. It is a subject, too, about which there is, perhaps, more difference of opinion among us than about any other connected with our craft. That some better system of training young architects in the way they should go is desirable seems admitted on all sides. For although the advantages of pupilage or apprenticeship are so great that they are not likely to be given up, still the student must of necessity supplement the experience gained in his master's office by study and reading of his own, and the office is and should be to him rather the place where he may expect to see put into practice the lessons he has learned elsewhere than the place where he can expect to be taught directly everything that he ought to know. He has, therefore, to join classes at art schools and to enter on a course of reading, sketching, and independent study of his own, and it is here that his troubles begin, and here, too, that he is likely to be perplexed by the totally different courses that are proposed to him.

The first nostrum that is offered him is one that is at first sight quite beside the mark—examination. To his demand for instruction the Royal Institute of British Architects replies, "We don't profess to teach you; you must get taught as you best can, but if you come to us afterwards we will examine you."

Now, the question of examination is not exactly our subject to-night, but it touches it in so many points that it cannot be avoided. For the present, however, we will pass it over, and by-and-by I shall find it necessary to say something more about it. After we have defined, with what preciseness we may, the kind of training and instruction necessary to make a man a tolerable architect, we shall be better able to judge how far the test of examination is applicable to it.

A better answer to the demand is that which you yourselves of the Architectural Association have given. The voluntary or mutual system of instruction which you have for so many years usefully carried on is now being expanded under your new scheme into a wider and more complete plan of architectural education which, if it is properly carried out, ought to go far towards supplying the want of which students complain. You are just at the beginning of a new career; it rests with you either to make it barren or fruitful; the question of its future usefulness depends entirely on the direction you give it at first starting—whether you shape it on the old lines of text-books and stale examples and conform it to the cut-and-dried rules of a hard-and-fast curriculum, or whether you guide it with a lighter and more liberal hand, and, recognising that all men are not gifted in the same way, give to your system that elasticity which will enable each student to develop any special gifts he may possess. The success of your scheme will, in fact, depend entirely on the view you take of the student's needs and of the nature of the instruction that will do him most good.

What, then, is it that the student wants to be taught in order to become an architect? In the first place, it is clear he must learn how to build well. Construction, planning, choice of material, and the proper use of it according to its nature, are not architecture, but they are the foundation of it; and, more than that, it is they that have moulded all the architectural styles that have ever really lived into the form by which we know them. But skill in construction and knowledge of building materials will not suffice to make the architect. He must not only be a good constructor, but he must know how to construct artistically as well as solidly. What architecture does for building is to give it the means of expressing itself, and of expressing itself with beauty and propriety. It does for building what the actor does for the play. The play may be written as well as you please, the repartee may be brilliant, and the dialogue sparkling; but if you drawl it out in an inexpressive monotone, you will at the utmost convey the bare meaning of the words, and you will awake no emotion. But let the actor declaim the same words with passion and feeling, and he will make you ready to start from your seat, or draw tears to your eyes. Just so with our art; two designs may be equally good in point of plan, convenience and construction, but the inartistic design, which stops with mere building, will give no pleasure and rouse no emotion; while the other, in the hands of an architect worthy of the name, arrests your attention and delights and satisfies the sense.

But though good building must precede good architecture, do not think that architecture is a sort of ornamental varnish that may be laid on to something else that is brought to it ready made. It cannot be applied to a building by way of improvement in the same way as you put gilding on to a picture-frame or butter on to bread. Your art and your construction must go together, hand in hand, from the very beginning. From the very first you must work with a view not only to strength and convenience, but also to beauty and fitness; from the first your plan and your architectural design must grow up side by side. While you contrive approaches and arrange your rooms, your mind will be busy at the same time forming a picture of the building as it will work out on these lines, and as you go on you will shift a room, or a wall or a pillar, recess one part, project another, or drill the whole into symmetry according to the architectonic idea in your mind and to the character you wish the building to have. All this will advance *pari passu*; there is no especial moment at which one can say, "Here architecture comes in." It has been there from the beginning, inseparable from the plan and construction, affecting and modifying them in a hundred ways, and being affected and modified by them in its turn. For their influence is reciprocal. If it is bad to study construction independently of architectural considerations, it is, perhaps, worse to study architectural design apart from construction. It cannot stand alone. Construction is the frame

work or skeleton on which the figure is modelled, and if you deprive it of its backbone, architecture falls into a helpless mass of powerlessness, as incapable as a jellyfish.

This, then, is what the student of our craft has to learn in the first place, and as the key to all that follows—to construct well with an artistic motive. Mere constructive skill will make him an engineer, but will never make him an architect; and mere acquaintance with architectural forms and skill in reproducing them may make him a good draughtsman, but will never make him an architect. Construction and design must be learned together, not as separate studies, but as one simple subject to be mastered by every one who aspires to be an architect.

Now, while there is abundant opportunity for learning building construction pure and simple, irrespective of æsthetic considerations, there is no school, so far as I know, for teaching construction in the architectural sense which I have indicated, and here is a want that your new studio may admirably well supply if you manage it aright. By way of making quite clear what I mean, let me make some remarks on what I saw there a few weeks ago when at your invitation I attended as visitor of the Advanced Class of Design.

Among the designs that were then produced were several that showed considerable promise. Mistakes in planning, of course, were to be found, but they were generally of a kind that experience would easily correct. What struck me as especially amiss was that the authors of these designs had seldom or never really considered how their designs were to be carried out. There were open-timbered roofs that looked pretty enough on paper, but which I was obliged to point out could not be constructed, because timber was not to be had 3 feet wide. There were arches, graceful and stately, which, for want of proper abutment, would infallibly have brought the building to the ground. But the worst was that the designers showed so little appreciation of the scale to which they were working. The drawings were all to the scale of 8 feet to an inch, and few of the students had thought what would be the effect of their details when enlarged to the real size. Some of them, when asked to sketch to a larger scale a section of the jamb of their windows or doors, were unable to do it. They had never thought about it, any more than they had about the scantling of their timbers or the abutment of their arches. Now, these are examples of design being studied apart from construction, and I should like to repeat here the suggestion I made there—that every student as he goes on with his design should make detailed drawings to a larger scale, or sometimes full size, of each piece of construction or each architectural feature. He could not fail then to know his own meaning. He would not be misled by his own small-scale drawings, than which nothing is more deceptive even to an experienced eye, much more that of a student. This year, among the designs sent up for the National Art Prizes at South Kensington was one which showed considerable ability, and was drawn in a taking way. A scroll of simple foliage, delicately touched in, filled a space over a doorway, and in the drawing looked very well; but measurement pitilessly exposed the fact that the leaves were 4 feet across, of which the author was probably quite unaware. He had been deceived by the scale of his own drawing, and had he been going to erect the building he would have had to alter his design, for with his absurd leaf the panel which it fitted would have had to go, and the whole composition would have been affected. There were submitted for composition numerous other designs where construction had been altogether ignored or evaded—domes and lanterns with no visible means of support, and so on; but I have selected this simple instance because the author had evidently to a certain extent considered his design properly and thought it out, and would not have made this mistake had he taken the trouble to make a working sketch, however slight, to a larger scale.

Another suggestion I ventured to make in your studio the other night was that besides being always required to draw details of the designs to a large scale, the students should proceed to write a short specification of the work. What is a specification? I do not mean the senseless farrago of repetitions and stock phrases that some people write, but a sensibly written document, with no unnecessary verbiage. It is simply a letter to the workmen telling them once for all what, if you had no specification, you would have to tell them bit by bit as the work went on. You forestall the innumerable questions the workmen would have to ask when the occasion arose, by writing their instructions down for them before they begin. But it serves another purpose as regards yourself. It forces you to define to yourself your own intentions. It perhaps reveals to you something in your design that will not do, and compels you to alter it; it obliges you to fix the notions that were floating in your mind, so as to admit of being put down in black and white; and it discovers to you any point on which your knowledge is imperfect, and about which your ignorance may need to be enlightened. I venture to suggest this as an excellent corrective to the tendency to fanciful and unpractical design, of which I saw signs in your new studio, and which cannot too soon be reduced to the stern rule of common sense and necessity.

Let this, then, be the first rule of your studio, that every student should make it clear in his own mind, and to that of his teacher, how his design is to be carried out—how the thing he is designing is to be made; and, if he cannot explain this satisfactorily to himself and others, he should be told that it is of no use his going on till he has cleared up the mystery and solved the problem in a satisfactory way as regards both sound construction and good artistic form.

The great importance of this becomes evident when you consider what it is that an architect is called upon to do when he has a building to erect. Unlike the painter and sculptor, he does not produce his result by handling and shaping the materials himself, but by directing others how to do it. Remember that it is your work to design for craftsmen. What you draw on paper they will have to make somehow as best they can, and if you do not know how your own designs are to be carried out, how are they to know it? As you are working out your plans and elevations, try and put yourself in the place of the clerk of the works or foreman who will have to work from them; ask yourself what explanations he would need, and amplify your details and descriptions to meet his imaginary wants. In this way you will avoid making mistakes and omissions which might upset your design, and which otherwise you might not be able to detect; and you will discover to yourself your own ignorance and see what it is you have still to learn.

And while I am on the subject of your drawing-classes there is another suggestion that occurs to me, and that is that the students should as early as possible be accustomed to put their designs into perspective. Nothing is more misleading than the habit of designing in elevation. An elevation is nothing but an upright plan, just as a plan is, if I may so put it, a horizontal elevation. Both are mere conventional representations, mere working diagrams, correct for use with rule and compass, but conveying no idea of the effect of the design. You may take it for a general rule that a building which looks well in elevation rarely looks well in perspective, and as we see buildings in perspective, and never in elevation, you will readily see which of the two ought to be first studied. My own practice, except in the simplest buildings, where I can trust my experience without trial, is always to start a perspective at the same time as the elevations, and when the building is got to look right in perspective, I work back from it to the elevations, and alter them to suit the perspective. And this I would strongly recommend to your students as the best way of shaking their confidence in geometrical drawing, and teaching them as they go on to consider how the proportions and dimensions they are adopting will strike the eye in actual work. Some of the best among the designs which were shown me the other night would have come out in perspective very differently to the intentions of their authors, and I fear have caused them considerable disappointment. It is a common joke against architects that they take in unwary clients by showy, attractive drawings, that hold out a promise which the building fails to realise; but I am sure that architects themselves are quite as often taken in by their own pretty drawings, which come out very differently in bricks and mortar from what they appeared on paper.

So much, then, as to drawing, which, after all, is not the main thing, for our drawings, it should be borne in mind, are not to be regarded as works of art, but rather as diagrams to explain the design to those who have to realise it. The design is the great thing, and the main object of an architect's education should be to train him in habits of design, to strengthen his imaginative powers by exercise and to correct his taste by showing him good models. Two things are necessary to him—imaginative power and knowledge. No one can give him the former, and if he is quite devoid of it, it is useless his thinking of being an architect. But it is not necessary to have genius in order to turn out very fair work, work which is quite capable of giving a great deal of pleasure, much more than that afforded by the efforts of genius when misdirected and ill-applied. "If you have great talents," says Sir Joshua Reynolds, "industry will improve them; if you have but moderate abilities, industry will supply their deficiency. Nothing is denied to well-directed labour; nothing is to be obtained without it. . . . I will venture to assert that assiduity unabated by difficulty and a disposition eagerly directed to the object of its pursuit will produce effects similar to those which some call the result of natural powers." Moderate powers of imagination will grow stronger by practice, by observation and by discipline. They can, in short, be educated like any other faculty.

The other necessary qualification, knowledge, depends on the student's own industry, assisted by proper teaching, and this assistance you now propose to give him. Some things he will learn from books; the history of his art can be acquired only by reading, and some knowledge of it is, of course, indispensable, while, if he has time for it, he cannot know too much. But let him be on his guard against thinking that a historical knowledge of art will do anything of itself to make him a better

architect. "A perfectly illiterate man," says Sir Joshua, "will never make a great artist;" but all the same, a man may be a very good artist without being a man of letters. It is impossible that every student of architecture should attain the same literary culture, nor is it necessary. No doubt the more you love your art the more curiously will you study its history, but do not suppose that by learning the names, dates and history of the authors of the buildings of the past you are studying architecture. You are merely following an interesting and natural course of antiquarian research, which it is most highly desirable that you should follow, but take care to disabuse yourself of the notion that it will help you in the least degree to be a better architect. Not that I would in any way dissuade you from these studies if you have time and taste for them; they are not architecture, it is true, but, at the same time, if you are nothing but an architect you will be a very dull fellow; only, distinguish carefully in your mind between the study of your art and the study of its history and antiquities, which is a totally different pursuit. As an art-student you must of course understand the sequence of styles and their characteristics, how they grew out of one another, and, in their turn, developed into something new; but in that capacity you will have nothing to do with the social history of the age of which they formed the outward expression. Your business is with the value of ancient buildings as works of art; if you admire them, analyse the causes which make them beautiful; if you are disposed to criticise them, do not be deterred by any reverence for their antiquity, but judge them fairly to the best of your powers. Look at them with your eyes open, appraise them without prejudice, try to understand them without being blinded by the charms of old association and historic interest, and in that way you will get from them all the help they are capable of giving you in your architectural training. In short, be an artist first and an antiquary afterwards, remembering that your vocation is not the study of the art-work of the past, but the creation of works of art in the present.

With this point in view, do not confine your study to old work. Watch also the current architecture of the day, so far as it is worth watching. It has always been the laudable practice of your Association to visit new buildings and works in progress, and you cannot do better than continue that practice in the future. When one does find good modern work there is something about it more inspiring and stimulating than there is about old work, however superior the old work may be. You feel that your own case is not hopeless when you see good work done by your friends and contemporaries, who are within your reach, not removed, like the great masters dead and gone, who speak to us only by their works. You there see also the application of novel materials and new ways of using the old, and you find in them suggestions for new design on your own part, and if there be any real life in the work you are studying it cannot but be enlivening to be brought into contact with real living art in your own day and country.

Bearing the same point in mind, let your reading be of a practical kind. Besides books of technical instruction in carpentry, masonry, brickwork and so on, read such works on architecture as deal with it from the constructional as well as the historical and æsthetic side. There is no better reading of this kind than is to be found in Viollet-le-Duc's great "Dictionary." His conclusions are sometimes fantastic and his judgment prejudiced, but if you read carefully his article on "Construction," which occupies nearly a volume to itself, analysing and making notes as you go on, you will rise from it a wiser man and will have got a better understanding of the nature and motives of Mediæval architecture than by any other reading I can tell you of. There is nothing comparable to it unfortunately in English, and indeed considering the mass of printed matter about architecture, it is wonderful how few books there are of any direct use to the student. Encyclopædias, dictionaries and handbooks there are in plenty, but few of them go really deep into the subject. A work that professes to treat of all known styles, ancient and modern, within the boards of an octavo volume or two, cannot be more than superficial. Even Fergusson's books, excellent as they are, capable as far as they go, are more useful to the amateur than the student.

Above all, do not try and make yourselves all at once encyclopædias of architecture. Confine your study at first, and, indeed, to a great extent all your life afterwards, to those styles which practically concern our modern use. Egyptian, Assyrian, Persian and Indian architecture are interesting studies, and no educated man would like to be entirely ignorant of them; but the knowledge which contents an ordinarily educated man will suffice for you. Dare I say the same of Greek art? I approach the question with some trepidation, but, to speak honestly, I should say that it may safely be put on one side by the student and regarded, even in his riper years, rather as a splendid illustration of what art can achieve under certain conditions than as having any direct bearing on his own work. With Roman art it is different; as the system of Roman polity permeates our civil constitution, and the roots of Roman speech intertwine themselves with our language, so did Roman architecture, in its progressive transmutations, give birth to all modern European styles, both those of the Middle Ages and those of the Renaissance. Roman art must be studied, though to my thinking—I say it with diffidence and the consciousness that many of my hearers will disagree with me—it is most interesting when regarded in its parental relation to the styles to which it has given birth, and which will naturally be the main objects of your studies.

But it is not by reading books and studying illustrations that you will learn practical architecture. Reading about things is very different from seeing them; you will learn more by one visit to an actual building than by pages of description. Accustom yourself from the first to regard your books only as guides to teach you what to look for in real buildings, and follow up any course of reading by going to see for yourselves the things you have been reading about. In the same way do not think that by drawing in an architect's office you will ever learn how designs will come out in reality, or even that you will thoroughly understand the meaning of your own drawings. Go, if you can, to the building itself; see for yourself how the details work out; how the different parts are constructed, what difficulties they present and how the workmen surmount them. I have always recommended my pupils at the end of their term to put themselves for a season under a clerk of works, and help him to set out the work and direct the workmen. I cannot say they always take my advice, but those who have done so have not failed to benefit by the practical knowledge they gained.

(*To be continued.*)

Mr. H. O. CRESSWELL proposed a very hearty vote of thanks to Mr. Jackson, who that evening had done them an inestimable service by his calm and quiet consideration of their scheme, and by giving them the benefit of his ripe experience. He wished they had had that benefit while they were discussing the scheme, but it was not too late to embody the ideas thrown out by Mr. Jackson. They had not taken up the scheme till after the deepest thought and most earnest consideration had been given to it. They had not put it forward as a perfect scheme, nor had they any thought that it could not be improved. Mr. Jackson's suggestion that in working out designs details should also be worked out, had been attended to, and it was an instruction that it should be done. He cordially endorsed the suggestion that pupils should begin as early as possible to study perspective. Many showed a great ignorance even of the very rudiments of perspective. The suggestion as to the workshop was most valuable. It was also suggested at the previous meeting, though it was not made clear whether they were to run one themselves, or how it was to be managed. Visiting a series of workshops, he believed, would be advantageous. The question of examinations could, he thought, hardly be discussed by the Association. They, taking things and taking pupils as they were, had formulated their scheme. It was impossible for them to consider whether the examinations should be swept away or not. They had to recognise the examinations as a fact. If they did not prepare students for them, the students would go elsewhere. That was what had happened, and their students and attendance of the classes had fallen off previous to the starting of the new curriculum. One most important point of the scheme was that pupils should begin their studies as soon as they entered the office, and by continuous and assiduous study get their knowledge without recourse to cramming.

Mr. F. R. FARROW seconded the vote of thanks. He expressed his cordial agreement with Mr. Jackson's views about cramming. He had had some experience in the matter, and he endeavoured as far as possible to mitigate the evils of such a procedure, and to advance students with as little as possible of the cramming system. On other points he perhaps was not in perfect agreement with Mr. Jackson. A knowledge of the history of architecture—not of dates and of artists' names, for that was not history at all—in other words, the record of how the men of the past dealt with the problems of art was necessary for the purposes of design. Originality could only come by acquaintance with the artistic work of the past as well as of the present. In designing, two mental processes were at work. The one direct and conscious in the dealing with the problems of the actual requirements; the second a semi-conscious drawing on what was stored up in the mind. This was the only explanation of how ideas instinctively suggested themselves to the designer in the course of his work. Mr. Jackson's buildings were an instance in point. His inspiration could not be traced to any building or example, but suggested his acquaintance with the work and buildings of all periods. He did not think they could understand Roman work without a thorough study of Greek work. The late Wm. Burges had told them that from Greek art they could learn principles that the study of Greek art was absolutely necessary for a man to become a good architect. Mr. Jackson, he thought, would be pleased to hear that the most of their new students had come to learn architecture rather than study for examinations. Some of course intended to go up for examination.

Mr. REGINALD BLOMFIELD said he was glad to hear that all the students were not making the examinations their aim. Mr. Farrow's remarks on Greek art were most interesting, but the burning questions of examination and education were uppermost. They (the party he sided with) had been asked why they did not join in helping the Association and its work. The question, Is architecture an art or profession? was one of facts and not of names. After mentioning the various views, Mr. Blomfield said they looked on an architect, not as an unpractical man, but as a most practical man, who could do nothing unreasonable. They would discard from architecture the work of the quantity surveyor, and that business generally understood as the commission agent's. They would have students study materials, and work in the workshops, studios of sculptors included. It was desirable that there should be a proper school of design, and that, he thought, should be carried on by the Academy of Arts. He hoped to see a compact body of skilled men who would carry out the excellent motto of the Association, "Design with Beauty, Build in Truth."

Mr. S. VACHER said he thought pupils should have one day in the week to work in the contractors' workshops. Nothing would be gained by visiting workshops in swarms. Many of the students of architecture should be told after the first year or two that they were not fitted to become artists, and that they should take up something else. Some would make excellent draughtsmen, others craftsmen, &c. The Institute examination questions were not practical ones. Architects did not really begin to learn till they began to practise. Would it be possible for young men who had secured a commission to pay fifteen guineas, say, to an architect like Mr. Jackson to examine their designs?

Professor KERR said he had come expecting to hear some allusions to the question, Is architecture an art or a profession? now agitating the profession. He was glad to have heard the views of Mr. Jackson and Mr. Blomfield. He had never made any contention to be a great artist. Generally speaking, he would advise young men not to strive too earnestly after such a position. What the public of this country wanted was a certain amount of grace conferred upon their buildings, the buildings themselves being previously thoroughly well designed. Of course, when a genius was met with it was a duty to give his ability fair play, and to encourage him to the utmost. Generally speaking, the average man—and of course the meeting was composed of average men, with a few exceptions—would find, when he took up designing, that wisdom lies in moderation even in artistic aspiration. There was an entire misconception of the feelings and views entertained by the Institute. There was no disposition to discourage art, but the contrary. If Mr. Jackson and the other gentlemen would join them, they would give them as much rope as they liked in regard of art. The examinations he had nothing to do with, except the voluntary one which Mr. Vacher told them he had passed. Mr. Cates's examination—well, it was Mr. Cates's from beginning to end—he had nothing to do with it. Mr. Cates was a perfect man of business, a perfect representative of the three elements that had offended Mr. Jackson, Mr. Norman Shaw, &c. They should bear in mind that they were servants of the public.

A VOICE: No, no.

Professor KERR: No? I will speak, then, to those who consider they are. He did not, he said, mean to disparage art at all. He had defended it all his life, when a boy foolishly perhaps. The public opinion of the cultured classes of this country wanted their houses thoroughly well planned; secondly, the body corporate of the building well built; thirdly, in moderation as much substantial grace as could be put on the building. If they put too much, he would leave them to settle the matter with their employer. If they could put a moderate amount of grace on a building, there was an immense gulf between them and those who could not. Mistakes were made by the most artistic painters when they touched on architecture in their pictures. It was astonishing what even a small amount of good art would do for architecture. Mr. Cates had virtually said that in other societies of a kindred nature to the Institute, they found a bar to entrance identified with an examination of some sort, and he said it was desirable to place this bar at the door of the Institute. Who was to say "No"? He (the speaker) was particularly anxious it should not be carried too far; he would even grant that it seemed likely it would be carried too far. But do not let them disparage their colleagues for simply endeavouring to make a respectable appearance before the public. He could never forget that in his young days the Institute was a learned society. In a certain way it was on a level with the Royal Society and the Society of Antiquaries. Whether it was so now he would not say, but if Fellows were to be admitted by examination, it would not have that level any longer. It was well enough to examine a young man for associateship. Young men failing to pass could be told to come again in another year. But who could repair the injury done to a man who had been ten years in business? They would not submit to it. That a proper test, and one involving no indignity, so he would call it, should be applied, he granted. Professor Kerr expressed great satisfaction with the doctrines promulgated by Mr. Jackson as to education. Nothing could be more sound, practical, or more deserving of the greatest consideration of the Association. In what Mr. Jackson said, he represented the views of the Institute to the letter. As to the scheme of education started so courageously by the Association, it was not for him to express any opinion. He agreed with Mr. Jackson that the way in which it was started was vital. They must not expect too much at first, but go on steadily for a year or two, and see what could be done and what could not be done. Their President could not take too serious a view of his position in regard to it. Looking at the whole question, the Association was to be congratulated on the boldness, earnestness and intelligence with which it was being conducted.

Mr. E. S. PRIOR disagreed with Professor Kerr. If architecture were such as he represented it to be they should lay it aside altogether for their own peace of mind. The way to serve the public was to lead them to a better idea of architecture. Professor Kerr said he would like them to come back. At the time they had been asked to come back they, after consideration, expressed to the Institute their distrust of the examinations as fraught with disaster to architecture. This was a vital objection with them, and the Institute answered by saying that they could make no change; that the examinations were included in the charter. But Professor Kerr's remarks had, he thought, nothing to do with the subject for discussion that evening, in other words, education. Architectural education might be viewed in two senses, as an end for its own sake, or as a means as now generally understood for passing the examinations. A society wishing to do the best for its members that desired to become architects should have nothing to do with what he would call general education, but only with education for the purpose of making an architect. When first he was a pupil his master told him it was no good trying to be an architect unless he could be a good architect. There might be humdrum doctors or lawyers, but not humdrum architects. Architecture was a serious operation; everything must be sacrificed to it and the knowledge of it not acquired in a humdrum way. That was one of the first lessons he learned. Next, the learning to draw was merely learning a shorthand method of representing what a building was really going to be. As to books, his master gave him Viollet-le-Duc's book, but said it was only archæology and would not teach him architecture. Knowledge of construction, he was told, would come in time. It did come in time. His master sent him off to act as clerk of works for one of his buildings. He had supposed there was a great mystery in construction, but there was no mystery in it at all. It was all a matter of common sense. There was no science of construction; it was the experience of construction found out by a man working with his own hands. He was the real artist who worked with his own hands, and not the man who sat and worked in his office. The architect must make himself thoroughly conversant with his work. No such knowledge could be got from books; it must be got by working by hand, by continually seeing work done and by mixing with workmen. Since those days these impressions of his had deepened, and it was his opinion more than ever that an architect must devote himself heart and soul to his work. He could not follow Professor Kerr in his definition of an architect, a matter dealt with by Mr. Jackson, that an architect was a three-legged animal—an ass, a horse and a mule. An architect could not be a commercial man, nor a professional man only striving for a living and an income. The education started by the Association should be a true education to form men for a reality and not for a sham.

Mr. E. PRIOLEAU WARREN objected to several of Professor Kerr's opinions. Examinations no doubt afforded the best facilities for those who wished to make a respectable appearance before the public, but he hoped none would have that aim. Everyone had in some way to be a servant, but he objected to their being the servants of the public, and most entirely protested against the expression if it meant subordinating their own taste to the whims of the public. He was glad to find the Association prepared to take up an independent position in education, and was not aiming at becoming a cramming school for the Institute examinations. A real architect knew he was an artist. It was not supposition. An inferior architect indeed was precisely as much entitled to consider himself an artist as the inferior painter or sculptor.

Mr. STATHAM said there was a difference between houses, pictures and statues; houses were lived in. It was somewhat important that those who designed buildings should be able to save us from bad drainage and other faults of construction. The progress in sound technical knowledge was in a great measure due to the movement for holding examinations.

The PRESIDENT remarked that they had had the pleasure of hearing the views of the memorialists from Mr. Jackson and Mr. Blomfield. The examinations had been started, and provision had to be made for them, but it was a mistake to suppose the scheme was only meant as a preparation for the examinations. He then put the vote and it was carried by acclamation.

Mr. JACKSON, in reply, said Professor Kerr had not removed any of his objections to the course the Institute had taken. The view he had always taken of architecture was, that grace could not be added to a building; construction and design must go hand-in-hand. If education was needed for architects, still more was it needed for the public. It was the business of architects to teach the public by putting good work before them and not pictures, as it was well known the Architectural Room at the Royal Academy was never entered by them. Why should architects more than other artists be a close body? He could understand an Institute of Architecture, but not an Institute of Architects that was a close body. It was injurious to the Institute. He would like the distinction between architects and builders done away with. Nine-tenths of our buildings were not designed by architects at all. Why trouble about the other tenth? What did the Institute intend to do with the majority of those buildings? Should not the Institute be composed solely of architects? But was it? If an architect took a right view of his art, he should give his whole time to it. Many a man called himself an architect and surveyor. If a barrister worked as a solicitor he would be disbarred.

INSULATED CONDUCTORS.

A PAPER was read by Mr. W. H. Preece, F.R.S., on "The Specification of Insulated Conductors for Electric Lighting and other Purposes," at the meeting of the Institution of Electrical Engineers. In this paper the fallacy of the present mode of specifying electric light conductors was exposed, and a new standard of insulation, based on the well-known qualities of guttapercha, was proposed. The qualities of the numerous insulating materials now in the market were measured and determined in this new standard, and it was shown that any classification of cables should be based on the pressures to be resisted, and should depend on the thickness of the insulating wall. The introduction of cheap and nasty cables, owing to competition and the absence of specification and inspection, was strongly commented on. It was shown that all danger was eliminated by the use of proper material and proper design.

Correspondence

Architecture—A Profession or an Art?

SIR,—Is not your correspondent "Phil-Artes" filled with a sort of superstitious faith in the virtues of an architectural society? As far as I can discern there is not the least necessity for the confabulation he proposes between deputies from the existing societies and Royal Academicians. If by some fortuitous combination of circumstances they could be brought to an agreement about a brand new society, where would be the gain? Could any society aid in discovering clients or ensure that commissions would be equitably distributed? The only advantage that can be derived from an organisation of the kind desired by "Phil-Artes" would be a further cheapening of assistance. At the present time, thanks to the action of the societies, it is easy to find assistants who are glad to work without salary. As one applicant of the kind said to me, "How are my friends to discover that I am not well paid? and at any rate I am gaining experience." When the market is stocked in that way, clerks who are not temporarily employed, must accept a lower salary than hitherto was to be secured. By what operation of a new and universal society would it be feasible, if it were desirable, to extort services at a less rate than is now generally paid? The question of education is a bore to most men, for it appears to be interminable; but it is the stock-in-trade of all architectural societies, and if it were set aside their real worth would be apparent. As long as office expenditure is diminished by the prevalence of education, I suppose architects have no right to complain. Fortunately, it is not necessary to belong to a society in order to have the choice of excellent and cheap assistants.

The new society which "Phil-Artes" desires to see set up would necessarily resemble those which exist. That is to say, the majority of the members would pay in order to derive advantage from being inscribed in the same list with the minority. If Mr. Norman Shaw would accede to the appeals and join the Institute, the subscriptions could be raised at once. It would be well worth a couple of extra guineas a year to be able to boast of fellowship with a gentleman of his eminence, and the wise men of the Institute would not fail to utilise the opportunity presented by so fortunate an accession. But as Mr. Norman Shaw has contrived to do good work without any help from a society, why cannot other men, although endowed with less power, imitate his example? From his letter I fancy "Phil-Artes" must belong to a society like many, and has suffered inconvenience in consequence, but I fear the taking-up with a new society would be like the change from the frying-pan to the fire. No society will enable him to get over difficulties, or will find him clients to propose them. His best plan, I humbly suggest, will be to imitate—Yours obediently,

AN UNKALENDERED ARCHITECT.

The Ordnance Survey and Archæology in Ireland.

SIR,—That part of the address of the President of the Royal Irish Academy in your last number which relates to the Ordnance Survey must amaze all those who are old enough to be acquainted with the facts of the case. There was a time when Bishop Reeves, who delivered the address, looked up to the late George Petrie as his father in archæology, and used to confess his filial obligations openly in Dawson Street and elsewhere. He was not afraid to sympathise with Petrie and his friends after they were treated most shabbily by the Government in connection with the Survey. But now all is changed, and his lordship has become oblivious of the transaction. The Ordnance Survey, it appears, "has conferred many benefits directly and indirectly on our country, and among them the purification of the Academy traditions and the infusion of fresh energy into its constitution. It gave an impulse to patient investigation and inductive conclusions, and it fitted for after-life a body of men who, trained in the strictest discipline of mental investigation and exactness, were prepared, when their temporary engagement was concluded, to be the missionaries of sound reasoning and dispassionate judgment in the application of the arts and sciences. It was in this school that Petrie found encouragement and O'Donovan employment."

Your English and foreign readers must be puzzled when they find so many results attributed to the operations of a Survey which they believed was carried out by officers and men of the Royal Engineers. It may be well therefore to inform them that Dr. Reeves, whose description is most indefinite, was not referring to the measurements of the country by chains and theodolites, but to another work which was not contemplated when the Survey was commenced. That supplementary work was described by Lord Brougham as "a corollary to the Survey, more valuable than the Survey itself," but it was never completed, and the advantages which, as Dr. Reeves supposes, issued from it are therefore only imaginary.

It originated, strange to say, out of the necessities of orthography. Ireland is not only divided into provinces, counties, baronies and parishes, but into townlands, which vary in size from single fields to large districts. The Royal Engineers, or Sappers as they were called, soon found great difficulty in respect of the names of the townlands. The tenants supplied names which were not confirmed by the owners and their lawyers; sometimes the names were given in Irish, sometimes in English, and occasionally in a mongrel combination. A denomination of twenty syllables in Irish must have sounded as strange gibberish to the privates and sergeants of the Sappers, who were generally Englishmen, and it is easy to imagine the mess they got into in attempting to write the words. But it was known to the heads of the Survey Department that the townlands were a topographical puzzle, to which some clue might be afforded by accurate spelling of the names. It was remembered that in 1815 there was an inquiry, and while some witnesses described the townlands as divisions of land that were commenced to be laid down in the time of James I. and afterwards by Strafford, there were others who considered they were made by ancient tribes. Davis says that "some of the townlands from their names seem to have been household lands of princes, others were hospitality lands attached to the caravanserais which the ancient Irish so liberally endowed, but most of them must be accounted for in other ways. We should be disposed to say that each was the possession of a large family or small sept, by the aggregation of many of which the great princedoms were made up. If these names and divisions are of older date (as we believe), then they either originated in, or were used for, the annual distribution of lands which was customary under the Brehon law." There was no man better fitted than Captain Larcom, R.N., who had charge of the preparation of the Ordnance maps, to appreciate the importance and interest of the most exact spelling of townland names, and he prevailed on the authorities to allow him to engage experts for that purpose.

The new department was placed under the charge of George Petrie. He was known as a landscapist and archæologist who was familiar with all parts of the island. Petrie was also a pioneer of the school of scientific archæology and was most careful in weighing evidence. His character was formed long before his appointment on the Ordnance Survey, and it is unfilial if not absurd for Bishop Reeves to suggest that Petrie owed anything to his co-operation with sappers and miners. John O'Donovan and Eugène Curry were, however, the chief experts, for they were masters of the Irish language. The former had commenced the preparation of his Irish grammar

in 1828. It was my privilege to have been united with O'Donovan in some archæological investigations, and I can say that he was employed on the Survey because he was qualified for the post that was offered to him. He was not taught by the sappers. In Ireland he was recognised as the first of Celtic scholars, but he was modest, and often told me that he was far behind Jacob Grimm in knowledge of the relations of Irish to other tongues. But great as he was as a linguist, I believe that the bent of his mind was towards topography. Like Antæus, he was strong when he touched the ground. Dr. Reeves and many others who knew O'Donovan as a translator, editor and commentator may be amazed when I say that if Fate had placed him in Germany or France he would have been the first geographer of the age. To bring out his powers to their fullest extent it was best to begin with something on the earth's surface. Anything he saw upon the ground he remembered, and to mention a fragment of an old wall was enough to draw a history from him. Ireland produces strange geniuses like O'Donovan, and as the sappers were able in every village to find barefooted boys to work out their areas (I believe Dr. John Tyndall's scientific powers were first exhibited in that way), they also found no difficulty with higher requirements. In O'Donovan they had a compound of the topographer, philologist and archæologist ready-made for use. His relative, Eugène Curry, was a man of another sort. He possessed one of those oppressive and mysterious memories that are found only among the Celts, and which seem to reach back for centuries. As an Irish scholar he had the tenderest conscience for details, and I am afraid the substitution of one letter for another in spelling, if he afterwards fancied he committed an error, made him suffer pangs of remorse. To say of such a man that he was taught exactness on the Survey, plainly shows that Dr. Reeves's memory has not grown tenacious under the weight of a mitre.

The truth is that with a most trifling sum Petrie was able to do wonders, because he was able to utilise men who, like himself, stood in no need of training by Ordnance lieutenants. Why had not Dr. Reeves the courage to state what did occur, and why did not the members of the Irish Academy insist on a more accurate version? Was the presence of a Lord Lieutenant supposed to make it necessary that the history of the affair was to be related as if it had been composed by a clerk in one of the circumlocutory offices?

As Petrie and his company of friends have gone to join the Vallanceys, Bethams, Ledwiches, O'Connors, O'Briens and the rest of the imaginative archæologists, it does not, however, matter much to say in public they were fitted for afterlife in Mountjoy Barracks. Their countrymen neglected them during their lives and are not likely to be anxious about their reputation. But there is a subject on which they were interested, and which is of much importance to living Irishmen, that was in the most mysterious way ignored by Dr. Reeves. Can any reader, from the address, imagine that part of one imperfect volume represents the labours of the archæological department, with the exception, of course, of the correct spelling of the townlands? The Ordnance memoirs were to relate to the geology and social condition, as well as to the archæology of the counties, but the appearance of a single volume frightened the Government, and the publication was summarily suspended.

Amphora cœpit
Institui; currente rota cur urceus exit?

Dr. Reeves did not inform the Academy of so melancholy an ending to the labours of Petrie and his band of archæologists. Nor did he suggest to the Lord-Lieutenant that some use might well be made of the four hundred manuscript volumes which were produced for publication. The archæological part of the Survey thus ended in a most discreditable fiasco. Is it any wonder that after such a fate for his labours O'Donovan should have told me that he had resolved to keep his children from learning one word of Irish? There is no danger now to arise if all the information were published, and the President of the Royal Academy might well have drawn attention to the subject.

There is another and no less disagreeable matter which must also be noticed. The Bishop says that through the Survey the Academy traditions were purified. Can he have forgotten the discussion which took place over the publication of Petrie's first volume on the Round Towers, and how many members of the Academy insisted on claiming the copyright because the author was awarded a prize that was offered for an essay by the Academy, and the difficulty with which the subject was settled? Poor Petrie did not attempt to test the justice of the Academicians a second time, and in consequence the rest of his great work which represented so many years of toil and so much enthusiasm was never made public. His fine woodcuts were used to illustrate a theory which Petrie would have abhorred.

Again, does the Bishop forget the circumstances attending the election of John O'Donovan, and how Academicians who were jealous of the reputation of the body were compelled to go about and solicit members not to degrade the Academy before foreigners by rejecting a man whose name was known to all those who were engaged in tracing the branches of Sanscrit? Yet at the time it was notorious that there were many Academicians who were unable to spell English words. The objections to O'Donovan were three:—He had worked for the Academy; he was poor; and he was a Romanist. The two cases afford an odd commentary on the Ordnance purification.

I must apologise for writing at such length. But as I know *The Architect* is read by archæologists in England and elsewhere, I should not like them to imagine that the address by his lordship of Down, Connor and Dromore, which you printed last week, embodies all the facts about the indebtedness of the foremost Irish archæologists of the century to the training they underwent under the direction of the Ordnance surveyors, who were little better than machines. It is a libel on men who merited to be treated with reverence by all members of the Academy. Let any critic compare the work done by Petrie and his friends before they accepted their unlucky appointments with their work of a later time, and I defy him to trace any improvement which can be attributed to the Ordnance Department. With quite as much justice the Bishop might have claimed the marvellous poetic faculty of metempsychosis of Clarence Mangan as being derived from the honest but prosy sappers, because he was a clerk in the Department, or the enterprise of Mr. George Smith, with whom "the Academy went hand in hand," in buying antiquities, because he sold Ordnance maps. Loyalty is an excellent thing, and it is well to display it, but it becomes ridiculous when it leads people to believe that uninformed soldiers are the best teachers of archæologists.

I feel I cannot expect much grace owing to the length of my communication, but you and your readers may rely on the accuracy of all it contains. I am quite confident that his lordship the President of the Irish Academy will admit that I am right throughout, and will not hazard the contradiction of one word in this letter. He knows all the facts, but I suppose he considered it was necessary to display his admiration for officialism, and to endeavour to conciliate the scientists in the Academy, who would keep all archæologists out of the President's chair. *Vitium fuit, nunc mos est, adsentatio.*—Yours obediently,

T. C. D.

GENERAL.

The Liverpool Autumn Exhibition closed on Saturday. The total receipts amount to 3,796*l.*, as against 2,985*l.* last year, the sales of pictures amounting to 7,327*l.*, or 1,200*l.* more than was received during the exhibition of last year.

The Dean and Chapter of Rochester Cathedral are about to make an appeal for funds to complete the restoration of the cathedral in a less leisurely and more thorough manner than hitherto has been possible.

Mr. Marr, C.E. (Jenkins & Marr), of Aberdeen, has been appointed architect to the Governors of the Robert Gordon College.

The Designs of Mr. Thomas W. Cubbon, architect, of Birkenhead, have been adopted for a Wesleyan church and schools about to be erected at Ambleside, in the English Lake District.

The Rev. F. F. Grensted will read a paper, entitled "Egypt as a Home of Early Art," at the meeting of the Liverpool Architectural Society, on Monday, the 21st inst.

A Church, designed by Mr. Brooks, is to be built in Dover, which will be the largest in the town, and will cost over 10,000*l.*

Mr. Lennox Canning, A.R.I.C.S., Mem. Inst. Austrian Engineers, has been appointed engineer to the Town Council of Bloemfontein, Orange Free State, South Africa.

Plumstead Church, Norfolk, has been destroyed by fire. The nave, chancel and tower were all recently restored, and the bells rehung, but the edifice must now be rebuilt. A beautiful carved wood screen has also been destroyed. The registers date from 1558.

In Connection with the Architectural Section of the Glasgow Philosophical Society, Mr. Alexander M'Ara, at the last meeting, read a paper to the members on "Limes and Cements," with experimental tests.

At the Fortnightly Meeting of the Carlisle Architectural, Engineering and Surveying Association, Mr. Higginson, architect, read a paper entitled "With the Society of Architects in Belgium." The chair was occupied by Mr. Howard Smith, the city surveyor.

At the Annual General Meeting of the Manchester Association of Engineers the chair was occupied by Mr. Samuel Dixon, in the absence through indisposition of the President. The principal business was the election of officers for the ensuing year. Mr. G. B. Goodfellow, of Hyde, was unanimously elected to the presidency, vice Mr. J. West, M.I.C.E., who retires after having held the office for two years.

The Architect.

THE WEEK.

An account of an action taken by the representatives of the late Mr. John Rhind, architect, of Inverness, against Sir John Ramsden lately was given in the *Architect*. The sum that they sought to recover was 2,034*l*., balance of fees for architect's work at the mansion-house of Ardverikie and other works on Sir John Ramsden's estate. It was contended that Mr. Rhind had originally estimated the cost of the mansion at Ardverikie at 12,758*l*., whereas it had cost upwards of 32,000*l*. Sheriff Blair, who tried the case, found that no agreement was made between the parties as to remuneration, and that there was no warranty by Mr. Rhind that the works should not exceed the estimates. It was decided that 2,300*l*. was fair charge for the work done, and, after deducting a sum of 1,600*l*. paid to account, judgment was given for the balance of 700*l*., with costs. The decision was appealed against in the Court of Session, but it is understood the appeal will be withdrawn. As some amends to justice it is to be hoped the expenses which will have to be paid will fall entirely on the defendant.

Among the numerous and varied undertakings of the Cardinal Lavigerie is the erection of a cathedral in Tunis, and the design will be obtained by competition. The interior is to measure 60 mètres (196 feet 9 inches) by 27 mètres (88 feet 6 inches), and is to comprise nave, aisles, choir and sanctuary. There is to be a crypt with access to the sanctuary. The competitors are allowed a free choice as to style; at the same time it is suggested that a reproduction of one of the ancient Christian basilicas or of one of the ancient temples of Tunis would have suitability. The limit of the expenditure is fixed at half a million of francs (20,000*l*.), including architect's commission. A similar sum may also be assumed as obtainable at a future time for decoration, works of art and furnishing. The successful competitor will be entrusted with the execution of his design, and he will have to direct the works in person or by the agency of an architect who will have to be approved by the ecclesiastical authorities.

It is a pity contractors cannot be persuaded to settle their disputes without the agency of a public trial. A case came this week before the Chancery of Lancashire which, if followed out in the ordinary way, is likely to leave all the parties much poorer than they are at present. The whole affair turns on the penalty clause. On June 12, 1890, Mr. R. H. Heenan, the plaintiff, entered into a contract with the Cheshire Lines Committee to widen certain viaducts. The contract was to be completed in March 1892, and the penalty of delay was 50*l*. a day. The plaintiff entered into a sub-contract with Mr. Ives, the defendant, and under that sub-contract there was a special provision for punctual performance. The case for the plaintiff was that Mr. Ives had not fulfilled his contract duly in respect to performance, that he had made default, that Mr. Heenan had exercised his power of forfeiture and determined the contract, that he sought to enter into possession in November 1891, and was resisted by Mr. Ives and his workmen. The plaintiff obtained an injunction of which he now sought the continuance. He was desirous to restrain the defendant from preventing him from taking the execution of the sub-contract entirely out of the hands of the defendant, and from taking possession of and retaining, either for his own use or for the use of the parties he may employ, all or any materials, engines, or implements which the defendant may have upon the works mentioned in the contract. On the other hand, the defendant charged the plaintiff with being the cause of the delay, and asserted that the materials supplied by the plaintiff for the execution of the contract were not supplied in proper time, and that the quality of materials was bad. Sir F. H. Bristowe, Q.C., after hearing the statements of counsel, said that when the case was before him on the last occasion nothing was said concerning delivery of goods by the plaintiff to the defendant under the terms of the contract. Nothing was said to him about the correspondence, which went to show that there had really been a dispute between the parties concerning the delivery, and that the defendant had been complaining month after month as to the supply. The Vice-Chancellor would express no decided opinion as to whether or not the plaintiff was in the right, but he decided to let the present motion stand adjourned, making no further order. If the plaintiff and defendant are as wise as business men, and especially contractors, ought to be, they will take advantage of the respite and come to terms. They are not likely to have a more satisfactory settlement made for them by the judges than they can arrive at by themselves.

The Glasgow Corporation have arranged for a course of lectures in connection with the Arts and Galleries Trust. On Saturday Mr. Macgillivray, the sculptor, gave a lecture upon "The Sculptures of the Parthenon," with lantern illustrations. He began by an historical survey of the period in which the Parthenon was built and the government of the time. He described its magnificence of colour and decorative detail. The effect, however, was not bizarre. This was avoided by the skilful use of the colours and materials in their quantities and tones. Reverting to the present, the lecturer said we must all regret the almost total disappearance of all that had been described. He continued his historical survey by tracing the various changes from Pagan to Christian uses, and illustrating these changes down to the destruction of the Parthenon. Dealing next with the sculptures, he described them as distinguished by grandeur in the three great elements of the plastic art, namely, line, mass and movement. In the general character of the work there was nothing personal in the local sense. Their expression was eminently normal in quality and abstract in kind. The technical treatment of the material which they displayed had never been surpassed, nor had the spirit of nature ever been so wonderfully embodied. They must have been the production of a climax in the art of a school which had arrived at maturity, for we scarcely distinguished in them the traces of the archaic work by which they were immediately preceded, nor any sign of the pretty, almost effete, style which was presently to follow in the art of Praxiteles. After describing the marbles, Mr. Macgillivray said that to attempt to notice in detail the fragments of these great sculptures would lead to questions of doubt and argument unsuitable for so slight an essay. It would be equally unprofitable to attempt any critical notice of the pieces, as the result would probably be a wordy pile of admiring phrases. Without further ado therefore he left the subject and its charm, hoping that those to whom it had been introduced might desire to have further acquaintance with it. In conclusion, the lecturer expressed the hope that the new Art Galleries about to be erected in Glasgow would contain a complete collection of casts from the fragments existing of the sculptures of the Parthenon.

M. Rodin has made another attempt to satisfy the Commission having charge of the scheme for a monument to Victor Hugo in the Panthéon of Paris. As is usual with all attempts to apotheosise the poet, earth, air and water are dragged in as his slaves. Hugo is shown as supported by a rock against which he leans; three female figures with ugly faces are borne by waves to his feet, and above his head is a figure with vast wings that is supposed to represent heavenly inspiration, and therefore places a hand on his forehead. There is nothing that at first sight appears to be symbolical of Hugo's writings in the whole mass of plaster. There was more of the volcano (with, of course, French fire) in the man than of air or ocean, although Baudelaire said that Hugo's voice became deep in rivalling the sound of waves. Or if there must be something figurative, why not have a lion to represent the great sounds of the writer, which could draw so much money from French publishers, and a dove or something with "a monstrous little voice" to suggest the courtier who could write such humble letters when he sought the honour of a King of Prussia's patronage? M. Rodin is a man of genius, but he seems to have gone for inspiration to critics like Baudelaire, who could work themselves into frenzies of admiration, instead of judging Hugo by the lights that nature gave the sculptor.

ARCHITECTS' DIPLOMAS IN ITALY.

AS it will be necessary, if merely out of courtesy, for the French Government to express an opinion on the desirability of making the possession of diplomas a necessity for the practice of architecture in France, many inquiries have to be instituted. M. ACHILLE HERMANT was appointed to ascertain the conditions under which Italian architects work, and he has completed his report. It is hardly necessary to say, for the fact was generally known, that in Italy people believe in diplomas, and M. HERMANT can therefore only corroborate and give a sort of official endorsement to evidence that was plain to all intelligent travellers.

The position of Italy in relation to the question that was to be investigated is not difficult to understand. Architecture was one of the arts which had declined among a people who were the descendants of those who might be said to have recreated all the arts, and more especially the art of building. What use was new architecture in cities which were said to be the most appropriate refuges for all who had no ties to bind them to the world? As late as 1868, we find Professor DONALDSON, who was disposed to take the most favourable view of Italian work, saying, and no doubt with much sorrow, in his report on the Paris Exhibition, "The architects of Italy are not apparently animated by the same energy and brilliant qualities as distinguished their colleagues in the other departments of the fine arts. In their best drawings they look back upon the past." The latter words were applicable to others besides the architects, for it is not so long since Italy seemed to produce nothing but antiquaries among the educated classes. There was no great demand for new buildings during many long years, and the designs which were prepared for them were in art what the *libretti* for operas were in literature. The revolution in politics was not without effect on architecture. When the old order of government was changed, one of the results was seen in the eagerness with which new buildings were undertaken. It seemed as if Italy wished to manifest independence in that way. As generally happens, whenever sentiment gets the upper hand of prudence, more buildings were erected than were necessary, and many losses followed. It is possible also that several times the architects and builders were more distinguished for courage than for experience, and from want of training they caused accidents. But all these circumstances were to be expected in a country where the people were without the practical sense which comes from devotion to business, and to whom dishonesty was occasionally as excusable as punning, and overreaching the height of felicity.

Simultaneously with the zeal for building, the new conditions of life were exemplified by the development of all corporations and societies that could be utilised for modern purposes. If the architects at the time of the unification had been banded in any great association, they could easily have obtained approval of any proposals they put forward with the object of improving their profession. But as there was no union among them, the position of guardian to architecture was, without delay, assumed by colleges and other educational establishments, and there was no power to prevent the exercise of so much authority. The successive Governments were only too glad to allow the exercise of that kind of responsibility which made no demands on the straitened treasury. The people were too ignorant to be able to understand the limits of the teachers' powers. They knew that formerly Italian artists gained reputation through ways that were not direct, and accordingly it did not seem remarkable that after a course or two of mathematics or chemistry a student should be considered as competent to stand forth as an architect.

It must, however, be admitted that the curriculum that has to be gone through contains much it is advantageous to know. At Naples, where the people are supposed to take life easily, the lower and higher courses would take seven years to go through. In the first year the subjects are mathematics, Italian literature, universal history, elements of architecture, drawing, modelling and perspective. In the second year the subjects are continued, with the addition of general physics. The third year's courses comprise mathematics, chemistry, universal history, application of the orders of architecture, ornament, perspective, and the history of art. The first year of the advanced course is devoted to descriptive geometry, analytic geometry, graphics, mineralogy and geology, applied chemistry, elements of architectural styles, application of perspective to architectural details, interior decoration. The second year's work consists of applications of descriptive geometry, theory of mechanics, graphic statics, technological physics, developments of architectural projects, application of perspective to exterior and interior views, æsthetics and history of architecture. During the third year the subjects are applications of descriptive geometry, applied mechanics, applications of graphic statics, construction, topography, jurisprudence, architectural composition and restoration, perspective exercises. The fourth year's work is a continuation of most of the preceding courses in applied mechanics, construction in metal, technical architecture, jurisprudence, composition and perspective. After going through so large an amount of technical instruction, a student would, no doubt, be competent to begin work in an architect's office; but the people consider the courses are adequate to enable any one to practise. A college diploma becomes in their eyes a proof of experience, and it is a master-key for all offices in which architects are needed.

In Naples a man can design a house or a shed for himself or a friend, but it is risky to do more unless he possesses a diploma. Without that document an architect cannot be employed on any buildings which are required for governmental or municipal purposes. He is no less kept at a distance by the provincial or communal administration. His evidence is likewise of no account in Courts should he appear as an expert. Public work being withheld from architects who have not diplomas, it must follow that their private practice is restricted. But if such men are not allowed to design buildings, there is apparently no restriction about construction, and they can become contractors.

The practice in Rome is no doubt intended to be shown as an example to other cities. At the present time a diploma from the schools of engineering is requisite for all who desire to practise as architects. In some municipalities it is incumbent on an architect when setting up to bring the document to the public offices and have it registered, in order that his position may be legalised. In Milan an architect must also produce a diploma as evidence that he studied in one of the institutes in Rome, Naples, Palermo, Bologna, Turin, Padua, or in the advanced technical institute of Milan. In Palermo there is a municipal register of architects, and in order to have his name inscribed in it, an applicant must produce a diploma. Apparently all that is sought after in the Italian cities is knowledge of construction, and an engineer would thus become eligible for designing public and private buildings, although he may have given no attention to the art of architecture. The municipal regulations are consequently the real cause of the inferior style of many of the modern buildings of Italy. They are produced by men who have no more claim to be considered as artists than the designers of the majority of the railway termini and bridges in England.

There may have been valid reasons for insisting on evidence of knowledge of construction in Italy. In spite of the diplomas, new buildings collapse occasionally of late years, and it is possible that with more laxity in the municipal regulations the number of catastrophes would be increased. But the conditions of France and Italy do not correspond, and the arguments in favour of a diploma in one country are not necessarily convincing in the other. Certainly it would be remarkable if France were compelled to go to Naples for instruction in administration. In the French schools there may be too little attention given to construction, but that can easily be remedied. When in practice French architects must somehow become skilled in construction, for the law is severe in the infliction of penalties for all cases of accidents which arise from want of skill, and the Courts are not disposed to be lenient.

An attempt has been made to persuade the French Government that a diploma is indispensable if architecture as an art and secure building are to flourish in the land. But it should not be overlooked that the principal agents in the agitation on the subject are holders of such a docu

ment, but they find that it has no magic power, and commissions do not come to them. The Government will, however, be able to discriminate between public necessities and private interests.

TYPOLOGICAL MUSEUMS.*

MUSEUMS may be established for different purposes, and the objects in them should be collected and arranged to further the particular purposes for which they are intended.

Technical museums may be established for instruction in art, to improve the taste of those engaged in manufactures. Of these the South Kensington Museum, with the origin of which this Society had much to do, may be taken as the type. The National Gallery, in this sense, may be regarded as a museum of painting for the encouragement of artists. In a technical museum the object is simply to collect specimens calculated to serve, if not as actual models, at any rate as examples of styles to be imitated: the historical arrangement of them is of secondary importance. Although no doubt the same purpose might be served, and the interest of the museum increased, if they were historically arranged, still it would undoubtedly be proper in a museum instituted for this purpose that the primary arrangement should be from the standpoint of art. It is not a museum for general educational purposes, as it can never have been contemplated that the whole or the majority of the visitors should qualify as manufacturers or artists; or, if it is efficacious for general education, it is only so in the sense of improving the public taste.

Next we have to consider the purposes to be served by such an establishment as the British Museum. The British Museum was no doubt in its origin pretty much what local museums have hitherto been, a collection of miscellaneous antiquities, some small, others of enormous size. The collections of late years have been enlarged and classified in historical grand divisions or geographical areas, and the additions have been made as time went on with more regard to scientific arrangement in proportion to the advance of knowledge. But it has not been collected from the first upon any system, or with a view to any special purpose, certainly not for educational purposes. It has been necessary to obtain specimens as opportunity offered, and to exhibit them in rooms that are ill-adapted for displaying them historically, designed in subordination to architectural considerations, and not with a view to the best means of arranging the specimens. As a large store of antiquities it is probably the most useful institution in the world for savants, who know what to look for and wish to study them, in order to form their own classifications and deductions. As an educational museum it is simply bewildering, and although lectures have lately been given upon the collections, such lectures are available only for comparatively few persons, and those not the working classes, who go there to obtain knowledge by examining the antiquities and forming their own ideas upon what they see. It would be impracticable ever to convert the British Museum into an educational museum. More than half the objects would have to be eliminated and the apartments altered to suit an educational arrangement. It would spoil the museum for the use of savants. I call such a museum a museum of reference, or it might, perhaps, more properly be termed a museum of research.

I hold that the great desideratum of our day is an educational museum, in which the visitors may instruct themselves. For good or for evil, it is not here the place to discuss the question; we have thought proper to place power in the hands of the masses. The masses are ignorant, and knowledge is swamped by ignorance. The relative numbers of the educated and uneducated are enough to insure this. The knowledge they lack is the knowledge of history. This lays them open to the designs of demagogues and agitators who strive to make them break with the past and seek the remedies for existing evils or the means of future progress in drastic changes that have not the sanction of experience. It is by a knowledge of history only that such experience can be supplied. It is true that the history of laws, customs and institutions cannot be displayed in museums. You cannot place the successive links of development side by side in such a manner as to appeal to the eye, but the material arts are capable of such an arrangement, and the knowledge acquired in the one branch will be to some extent available in the other. The law that nature makes no jumps can be taught by the history of mechanical contrivances in such a way as at least to make men cautious how they listen to scatter-brained revolutionary suggestions. The knowledge of the facts of evolution and of the processes of gradual development is the one great knowledge that we have to inculcate, whether in natural history or in the arts and institutions of mankind, and this knowledge can be taught by museums, provided they are arranged in such a manner that those who run may read. The working-classes have but little time for study; their leisure hours are, and always must be, comparatively brief. Time and clearness are elements of the very first importance in the matter under consideration. The more intelligent portion of the working classes, though they have but little book learning, are extremely quick in appreciating all mechanical matters, more so even than highly educated men, because they are trained up to them, and this is another reason why the importance of the object-lessons that museums are capable of teaching should be well considered.

For an educational museum originals are not necessary. Casts, reproductions and models are preferable; the proper specimens can be more easily selected; they are infinitely less costly. Such collections are not dependent on the chance of obtaining what is wanted from original explorers. Museums of casts do not compete with the research museums, in which the originals should be stored. Models occupy less room than originals, and can be more easily arranged to exhibit sequence within a limited space.

In an educational museum specimens should be selected that are useful in displaying sequence. These should be arranged so as to show how one form has led to another. When there is actual evidence of the dates of the objects, of course the arrangement must be for the most part in the order of dates. But when, as in the case of most prehistoric objects and many of the arts of savage nations, the dates cannot be given, then recourse must be had to the sequence of type, and that is what I term "typology." It is not an accepted term, and I am not aware that it has been applied before to the study of sequence of the types of the arts. But it appears to me that a name is wanted for this branch of investigation, which the term "typology" supplies.

If it were taken to imply the study of fixed types as characteristic of particular phases of the arts, it would be erroneous. It includes the growths, varieties and developments of the several types. It supplies the want of dates by showing how certain forms must have preceded or followed others in the order of their development, or in the sequence of their adoption. It may be said, as a rule, that simple forms have preceded complex ones. Within certain limits this must be true, but it is not always the case, for in many instances progress consists in eliminating superfluous complexity and reducing the expenditure of time and labour. We have in this, as in all mundane affairs, to deal with degeneracy and decay as well as progressive growth: the two have gone on side by side. It is the work of typology to unravel the true thread of events, and place the objects in their proper sequence for the use of students. Typology forms a tree of progress, and distinguishes the leading shoots from the minor branches. The problems of the naturalist and those of the typologist are analogous. The difficulties are the same in both. In some cases the number of missing links makes it impossible to determine the true succession of forms. In such cases recourse must be had to survivals, as in the case of the majority of savage weapons or forms of art, in which the successive links, being made of wood or perishable materials, have decayed. But a theoretical and fairly accurate development may nearly always be traced amongst the arts of savages by objects in present use. When a simple form is suited to its environment, or when its use fulfils common purposes that cannot be better served by its successors, or when economy of labour is a desideratum, the simple form survives; as, for example, in the case of the common door-bolt, which is the father of all kinds of complex door-locks, and which is still used upon the same doors as the contrivances that have sprung from it; or in the case of the common hand-made pots that are still baked in an ordinary turf fire in the Hebrides, at the same time as the most skilled productions of our modern potteries. So in natural history, invertebrate and vertebrate animals and mammalia are all found living side by side in the same localities, although we know that they represent successive stages in the development of species. Typological sequence or typological continuity may be said to be established when the true succession of forms have been brought out. This is the object of an educational museum. Not only must the objects be specially selected and arranged for the purpose, but the building must be adapted to the proper display of them. Architectural features, handsome halls and corridors are impediments; at any rate, they are points of secondary importance. In my address to the Anthropological Section of the British Association at Bath in 1888, I suggested a rotunda as the best form for a national educational museum of arts, a plan of which was exhibited. The concentric circles of a circular building adapt themselves, by their size and position, for the exhibition of the expanding varieties of an evolutionary arrangement. In the innermost circle I would place the implements and other relics of the palæolithic period, leaving a spot in the actual centre for the relics of tertiary man, when he is discovered. The simple forms of the palæolithic period would require no larger space than the

* A paper by Lieut.-General Pitt-Rivers, D.C.L., F.R.S., F.S.A., read at the meeting of the Society of Arts on December 16.

smallest circle would be capable of affording. Next in order would come the neolithic age, the increased varieties of which would fill a larger circle. In the bronze age a still larger circle would be required. In the early iron age, the increased number of forms would require an increased area; Mediæval antiquities would follow, and so on, until the outer circle of all would contain specimens of such modern arts as could be placed in continuity with those of antiquity. Separate angles of the circle might be appropriated to geographical areas, and where civilisations in the same stage of development are allied to one another, they might occupy adjacent angles within the same concentric ring. Models would be largely used to explain the *gisement* of the relics exhibited. The sections and subsections would be divided under the head of arts, such as pottery, glass, enamels, architecture, house furniture, modes of navigation, land transport, house furniture, tools, weapons, weaving apparatus and textiles, metallurgy, painting, writing, music, mensuration, sculpture, ornamentation, personal ornament, agriculture, hunting and fishing apparatus, trapping, machinery, fortification, modes of burial, modes of punishment, monuments, coins, religious emblems, toys, heating and lighting, food, clothing, basket-making, narcotics, medicine, domestication of animals, and so forth. A manufactory of reproductions, casts and models would be attached to the institution, in the same manner as that established in connection with the museum at Mayence, under the direction of Professor Lindenschmit. The museum would be divided into departments, under the control of separate keepers. By such an arrangement the most uninstructed student would have no occasion to ask the history of any object he might be studying; he would simply have to observe its distance from the centre of the building, and to trace like forms continuously to their origin. Where breaks in the continuity of any art must necessarily occur, references might be posted to show the position of the concentric rings and cases, in which the threads of connection might be taken up again and followed. Such a museum would require constant rearrangement, as knowledge increased, and the cases might perhaps be put on wheels to facilitate their readjustment. An iron building with a glass roof would be the best for the purpose, and the less ornamentation it had about it to divert the eye from the main object of the establishment the better. Existing buildings, such as the Olympia, might perhaps be made use of as a commencement, as it would not be necessary the building should be round, provided the arrangement was concentric. But the Olympia would not be half large enough.

I have been much interested to learn, since my address was delivered to the Anthropological Section at Bath, that Professor Flower, who has already done so much in his Natural History Department since it was transferred to South Kensington to arrange the collections on an evolutionary plan, has independently thought out the idea of a large rotunda for exhibiting the development of species and varieties. A letter which I have received from him gives a rough sketch of the kind of museum that he would propose for the purpose, the present building being, in his opinion, quite unsuited for scientific arrangement. I have little doubt, therefore, that eventually this idea of concentric arrangement will be carried out, and that we shall have somewhere in the metropolis two large rotundas—one for natural history and the other for the arts of life. Professor Flower embodied his views on the arrangement of a natural history museum in his address to the British Association at Newcastle in 1889, in which he expounded very much the same principles for a natural history museum that I had advocated for an arts museum at the meeting of the previous year at Bath. That views so similar should have suggested themselves independently to workers in two separate departments, affords satisfactory evidence that they are in harmony with the requirements of the age.

In order to explain more clearly what my method of arrangement is, I have had prepared a number of large diagrams to show the continuity of several of the series exhibited in the Pitt-Rivers collection at Oxford. Some of these diagrams are very old, and formed part of lectures delivered at the United Service Institution in 1858-69, the Royal Institution in 1875, and elsewhere. Others are of more recent date and are taken from my provincial museum in Dorsetshire. Most of the diagrams were used in a lecture on my collection that was delivered lately at Oxford, at Salisbury and other places.

Having now laid before the meeting my views upon the evolution of types, I desire to make a few remarks on the evolution of my own collection now presented to the University of Oxford.

My attention was first drawn to this subject nearly forty years ago, when, in the year 1852, I was engaged as a subaltern officer on the sub-committee of small arms at Woolwich in the experiments which led to the introduction of the rifle-musket into the army. A large number of inventions were submitted to the committee for trial, and I was then led to take notice of the very slight changes of system that were embodied in the different inventions, and also of the fact that many improvements which, not being of a nature to be adopted, fell out of use and were heard of no more, nevertheless served as suggestions for further improvements which were adopted; and it occurred to me what an interesting thing it would be to have a museum in which all these successive stages of improvement might be placed in the order of their occurrence. I made a collection of arms at that time, which was the foundation of the present museum. Although this collection of arms was not a very good one, as my means of collecting were small, it led to a museum of savage weapons, and ultimately of various other arts, which were exhibited at Bethnal Green and South Kensington for nine years. Mr. Herbert Spencer, in his "Principles of Sociology," published in 1876, thus speaks of it as he saw it at that time:—"The collection of implements and weapons arranged by Colonel Lane Fox,* to show their relationship to common originals of the simplest types, suggests that primitive men are not to be credited with such inventiveness as even their simple appliances appear to indicate. These have arisen by small modifications, and the selection of such modifications has led unobtrusively to various kinds of appliances without any distinct devising of them." The portion of the museum relating to arms was described in an illustrated catalogue *raisonné*, which was in fact a treatise on the development of arms; this went through two editions at South Kensington, commencing in 1877. The collection afterwards grew to such size that I was anxious to see it housed in some public building, where it would be developed in other hands on the same lines, and I ultimately presented it to the University of Oxford. In doing this I made only one proviso of any consequence, which is contained in the deed of gift, viz. "that the general mode of arrangement should be maintained, and that no changes should be made in the details hereafter, except such as should be necessitated by the advance of knowledge, and should not affect the general principles originated by me." This took place in 1884. During the seven years that have elapsed since, the museum has been rearranged in the order in which it was exhibited at South Kensington, so that, in the main, the order of the several series is exactly the same. Some new links have been added to the old series, and some new series have been introduced. This has been done in the first place by Professor Moseley, whose death has been so great a loss to science, and afterwards by Dr. Tylor and Mr. H. Balfour, and has been carried out to my entire satisfaction in every respect, except perhaps the great length of time that it has taken to rearrange, which, I am informed, was unavoidable, as a building had to be erected for it, for which the University very liberally voted 10,000*l.*

But these are not times in which anything can afford to remain buried seven years, and I have had some difficulty in persuading people, now that the collection is resuscitated, that it is the same Lazarus that was alive before. In the meantime, however, I have formed another museum, which, although it is a provincial one, is in some respects better than the first, because such series as it contains are more fully represented. The subject of provincial museums has been lately much discussed in the newspapers. I have often observed that a little knowledge of the subject is necessary to create an interest. I have often noticed that visitors to our larger museums will wander listlessly through the rooms until they come upon something they understand a little about. Then they open their eyes and prick up their ears. It is interesting to them to compare the products of other countries and people in those particular branches of industry that they are familiar with. A local museum should therefore contain a good historical series of the prevailing manufactures or industry of the locality. Acting on this principle, it appeared to me that in a rural district, sparsely inhabited, with scattered agricultural villages and ten miles from every town and railway station, the chief feature of the collection should be agriculture and peasant handicraft.† I cannot convey my views on provincial museums better than by describing my own museum, because it has been collected from the first on a definite system, and has undoubtedly been a great success.

No. 1 room, 20 feet by 13 feet, contains pottery, costumes, personal ornament now in use by peasants in Germany, France, Spain and other nations. Some of these are of archaic design and are probably survivals. The second room, 19 feet by 14 feet, contains carvings by Brittany peasants, chiefly of the seventeenth century, French pottery in present use and village implements of various kinds. The third room, 18 feet by 13 feet, is devoted to a series of tools, household utensils, cooking appliances, &c., of different periods. The fourth room, 24 feet by 14 feet, has an additional series of country tools, and here commences a general series, illustrating the history of pottery, which is continued in rooms 5 and 6, and includes a sufficient number of specimens of each division to represent their kind, viz.:—Ancient British, Silesian bronze age, Etruscan,

* In 1880 I changed my name to Pitt-Rivers, in accordance with the will of the second Lord Rivers.

† The population of Farnham and the neighbouring parishes is:—Farnham, 301; Handley, 868; Tollard Royal, 247.

Egyptian, Swiss Lakes, Cyprian, Greek, Roman, Saxon, Norman, Mediæval, English toft ware, English salt-glaze, Staffordshire and other Old English wares, Scotch pottery, German, French, Swiss, Spanish, Italian, Persian, Anatolian, Japanese, Chinese, Moorish, Peruvian, Mexican. Then follows similar specimens of glass and enamels from different countries. Another general series not yet arranged will be devoted to sculpture and modelling. In the fifth and sixth rooms are models of excavations made by me in the locality, the relics from which are arranged in the adjoining cases. These are available for archæologists who may visit the district to see what it contains of local interest. Other models of ancient monuments, ninety-five in all, have been made under my supervision by my archæological staff, three to four in number, who are constantly engaged upon the work. These models certainly form the chief feature of the museum, and they are unique. The sixth room, 62 feet by 19½, contains also a general series of implements of the palæolithic, neolithic and bronze periods, iron age, Roman, Egyptian and Mediæval periods. The seventh room, 81 feet by 24, is only in process of building. The eighth room, 85 feet by 18, is devoted to agricultural implements and appliances, and contains spades and agricultural tools of all kinds, showing the survival of the Roman wooden iron-edged spade in several parts of Europe; querns and grain-rubbers, some of which are in present use; a Norse mill, showing the earliest application of water-power to the quern; grinding and winnowing machines; some models of crofters' cottages; a series of models showing the varieties of ploughs in present use in different countries; country carts, explained in the same manner by means of models; a series showing the development of locks and keys; a series of crates carried by country women of different countries on the shoulder, and collected expressly to show the women of my district how little they resemble the beasts of burden they might have been if they had been bred elsewhere. All these things are well ticketed, but an explanatory catalogue has yet to follow.

THE TOTNES TOWN HALL.

ANOTHER letter on the Totnes Town Hall from Sir J. C. Robinson has appeared. He says :—

The Totnes Grammar School has undoubtedly been altered at various times, but it still retains many of its original and most interesting features. The very fact of these alterations, made from century to century, has indeed added to rather than detracted from the interest of the structure. Together with the Guildhall, which it adjoins, it forms a group of ancient buildings of infinite picturesqueness and old-world charm. The quaint old doorway, mullioned windows, with their diamond-paned casements, and a curious bell-turret on the roof are still intact. Mr. Windeatt informs us that the building is now to be "remodelled," but that a portion of an old wall in a cellar is to be retained. This is a small mercy to be thankful for. Further than that Mr. Windeatt does not seem to know precisely what the county council intend to do. I am afraid, from the information given me in Totnes, that the intention is to entirely do away with the ancient features I have alluded to, in short, to substantially "remodel" an ancient building into a new one of entirely different design, and which would be quite out of character with its surroundings. As to the suitability of the site for a police-station, it is difficult to see how a building standing quite away from a thoroughfare, and which cannot be approached within 100 yards by any wheeled vehicle, can be suitable for such a purpose. Its entire unsuitableness was, in fact, pointed out to me during my short stay in Totnes by a leading inhabitant of the place. I may state that the matter was brought before the Society of Antiquaries at their meeting on Thursday week. The meeting was a very full one, and several of the members present were acquainted with the locality. Very strong feeling was expressed as to the course proposed to be taken, and it was resolved that a letter in the name of the society should be written to the Mayor of Totnes calling his worship's attention to the subject, and requesting his good offices in respect to it. This was accordingly done.

SOMERSET HOUSE.

THE following letter has been sent to the Secretaries of the Institute of Architects by the Secretary of the Office of Works :—

Her Majesty's Office of Works, 12 Whitehall Place, S.W.: December 16, 1891.
King's College Buildings.

Gentlemen,—In my letter of November 12 I informed you that the First Commissioner was in communication with the Council of King's College on the subject of the addition to the college buildings recently erected at the eastern end of Somerset House.

Mr. Plunket is aware of the great interest which the Royal Institute of British Architects has taken in this matter, and he therefore desires me to let you know what has passed, and the position in which it now stands. When it was found that building operations were being carried on, directed to the addition to the college of a structure which must seriously affect the river frontage of Somerset House, the First Commissioner deemed it his duty to communicate with the Council on the subject. Accordingly, on the 2nd ult., after some preliminary investigations, he caused a letter to be addressed to them, in which he claimed (as he believed he was entitled to claim) that under the deed of grant by which, in 1829, the land was made over to the Council the assent of the Crown was necessary before additions could be made to the buildings of the college.

To this claim the Council demurred, and the point was then referred by him to the law officers of the Crown. They have now given it as their opinion that the Council are within their right in erecting the structure in question, and that unless it interferes with the light and air of Somerset House the First Commissioner has no controlling authority. It cannot be said that the new structure does so interfere, and while the First Commissioner entirely concurs with your society in considering that it impairs to a lamentable degree the architectural effect of the river façade, he is compelled to conclude, though with great regret, that it is not in his power to pursue the subject further.—I am, Gentlemen, your obedient servant,

H. W. PRIMROSE.

The Hon. Secretary and Secretary to the Royal Institute of British Architects.

TESSERÆ.

Idealism and Realism in Art.

IDEAL beauty does not mean, as some seem strangely to suppose, an original or newly-imagined or invented type, the brilliant and original offspring of the gifted artist's mind and "evolved out of his inner consciousness." Human intelligence can only give form or expression to that of which it has, or has had, perception. It can originate nothing of the kind. Its power is not creative, but is limited in art to combination and the adaptation of existing elements. The result of a wholly ideal or imagined beauty, distinct from anything known in nature, could such be conceived, would be a monster of some kind, whereas the test of ideal beauty is the truthfulness of its resemblance to nature. Ideal beauty in imitative art simply means the highest idea or conception the human intelligence can form of natural perfection in distinction to the appearance nature offers in her ordinary aspect, where her normal excellence may have been impaired by accidental disturbance. The realistic school, as opposed to the ideal, aims at exhibiting objects precisely as they are exhibited ordinarily, that is, without selection and without improvement. In the lowest form of this school, and it has its degrees, no imperfections are allowed to interfere with the truth of the imitation. It is enough if the object be found in nature, and ugliness, coarseness, even decay and disease, are for this reason considered worthy of careful representation. The naturalistic and realistic schools have their source in the reaction from the tame, uncongenial repetitions of the classical antique that so long oppressed art. The principle of admitting subjects of present interest as fitting objects for its exercise merits, therefore, full acknowledgment; but it has its dangers in practice. How far its application or exercise may be safe or permissible in the art of painting, which has so many and diverse means of attraction in colour, chiaroscuro, perspective, atmosphere and the power to represent unlimited space, it may be difficult to say; but in an art like sculpture that has none of these accessories to depend upon, and whose most sure and approved instruments are simplicity, breadth of treatment, refinement and beauty of form, it may safely be asserted that such freedom, unless most judiciously exercised and controlled, is utterly incompatible with the conditions on which it can exist, if it is to aspire to rank, even *longo intervallo*, with the noble achievements of the great masters of sculpture.

Durability of Stone.

The physical properties which contribute to durability of stone are hardness, toughness, homogeneity, contiguity of the grains, and the structure, whether crystalline or amorphous. Although hardness (resistance to crushing) is often regarded as the most important element, yet resistance to weathering does not necessarily depend upon hardness and the non-absorbent properties of the stone. A hard material of close and firm texture is, however, in those qualities at least, especially fitted to resist friction, as in pavements and road metal and the wear of raindrops, dripping rainwater, the blows of the waves, &c. Porosity is an objectionable element. An excessive porosity increases the layer of decomposition which is caused by the acids of the atmosphere and of the rain, and also deepens the

penetration of frost and promotes its work of disintegration. If the constituents of a rock differ greatly in hardness, texture solubility, porosity, &c., the weathering is unequal, the surface is roughened, and the sensibility of the stone to the action of frost is increased. The principle which obtains in applying an artificial cement, such as glue, in the thinnest film in order to secure the greatest binding force finds its analogy in the building-stones. The thinner the films of the natural cement and the closer the grains of the predominant minerals, the stronger and more durable the stone. Of course the further separation produced by fissure, looseness of lamination, empty cavities and geodes and excess of mica tends to deteriorate still further a weak building-stone. Experience has generally shown that a crystalline structure resists atmospheric attack better than an amorphous one. The same fact is generally true with the sedimentary rocks also, a crystalline limestone or good marble resisting erosion better than earthy limestone. A stone that is compactly and finely granular will exfoliate more easily by freezing and thawing than one that is coarse-grained. A stone that is laminar in structure absorbs moisture unequally, and will be seriously affected by unequal expansion and contraction, especially by freezing and thawing. Such a stone will gradually separate into sheets. A stone that has a granular texture, as contrasted with one that is crystalline or fibrous, will crumble sooner by frost and by chemical agents, because of the easy dislodgment of the individual grains. The condition of the surface, whether rough or polished, influences the durability, the smoother surface being the better. The stone is more durable if the exposed surface is vertical than if inclined. The lamination of the stone should be horizontal.

Pictorial Effect in Painted Glass.

Pictorial effect is a quality common to sculpture, picture and glass, though different in each. In the two first it is always regulated by the space it occupies. No figure-painter, no sculptor of alto or basso-relievo, would so treat a subject, extending over a series of distinct spaces, as to ignore the forms of the architectural construction which bounded them. Each group would be complete; their connection would be made by the interest of their story. The metopes of the Parthenon, to a certain degree, illustrate this. It is much to be regretted that glass-painters are impatient of this law, which binds all other arts. They also violate the very nature of their own materials in the attempted pictorial effects of atmospheric perspective. These are properly attained only by modulation of colour and loss of outline. Neither of these are properly producible, for modulation is impossible where every piece of glass is of a different tint; and loss of outline is impossible where every piece is held in its place by a black frame of lead. It is answered that these effects are possible, and easily produced by painting in coloured enamels. Let the answer hold good; but we come then to the question of other limits—limits of the right and wrong of human labour, and limits of the duty to human sight. Excessive "finish" is not a necessary quality of high art; the highest art is that in which the greatest conception is the best expressed. The too high-wrought picture in glass condemns itself by the prodigality of human labour on a material so fragile that the least injury would mar it, and if the artist were dead or distant it would be irreparable. It condemns itself also by offering such work as no eye can rest upon to analyse without pain and fatigue. The fault of ambition lies in the pretension of an unjustifiable independence. If the glass-painter be impatient of all limits, whether of architecture or of the special qualities of his own materials—limits, too, of the pleasure, power or endurance of human sight and the use or abuse of his own labour—let him throw up his art and take to canvas. Then he may labour without stint and satiate the eye without fatigue; but if he is to be a glass-painter, let him honour his own art, and neither borrow the specialties nor wander into the province of another.

Completeness in Italian Architecture.

The mistake of building the front of a palace in stone, and suddenly dropping off, the instant the corner is turned, into brick, might occur to even a millionaire in this economical age, but would scarcely have presented itself to a Medici or a Farnese in the old days of Italian magnificence. Not that the wealth or the inclination to do what is handsome might be less in the one case than in the other, but that public opinion and system would keep the patrons of old straight, and allow those of to-day to fall into what cannot but be regarded as an architectural meanness. It would be, of course, too hard to point to any particular cases where hundreds are almost daily guilty of committing similar solecisms in taste, but unless we are to look for the exemplification of nobility of structure to those whose means place it within their power, how can we expect it from those to whom an increased expenditure might be a really important consideration? Nobility of material lavishly used, ample space, solidity of structure, and the gift to the eye of something obviously designed rather to please than to pay, together with the effect that such departures from rigid utilitarianism produce instinctively on the spectator—sources of effect lavishly indulged in in Italy at every period of her history—are only beginning to be appreciated amongst us in the present day. At the times when architects such as Inigo Jones, Wren, Gibbs and Chambers endeavoured to maintain in this country the principles of grand Italian architecture, founded upon the universal practice during the best Classical and Mediæval periods, marble, oak and stone were freely used. Cortiles and loggias, colonnades and arcades, were not banished as profligate waste of ground and money. Carving and the elaborate working out of ornamental features in true and just proportions were considered to be essential to fine effects. Paintings were not to be hung by accident against walls, here a *Madonna* and there a set of boors drinking, but allotted places were provided for them in the vaults and on the walls of the principal apartments. Sculpture, too, found its niches, and when English talent failed to supply it the services of foreigners, in despite of strong insular prejudices, were freely enlisted. And it was precisely when the public taste adopted a meaner class of building materials, a grudging spirit in the distribution of space, and a lower kind of internal decoration, that the arts of design in this country, with some few honourable exceptions, fell to zero. From that pitch of degradation and disintegration they are now happily rising into a concrete and perfect form, with a reaction the vigour of which is scarcely to be paralleled in the world's history. We are beginning to do better in each separate department of production, we are beginning to recognise that excellence in one must necessarily be combined with excellence in others, and we are beginning, in fact, to learn and practice the very system still lingering in the hearts and habits of the Italians.

The Decline of Italian Architecture.

The pernicious influence exercised by Bernini and Borromini, whose trivialities obtained excessive vogue during the greater part of the seventeenth century, tended to the production of that *rococo* style which caused a great deterioration in the florid ornament of the Roman, Venetian and Northern Italian schools. But, extravagant as Bernini was, it would be unjust to deny that he frequently redeemed his excesses, as in the colonnade of St. Peter's, and in the church of St. Agnese, in the Piazza Navona at Rome, by great facility of design and a certain not unnoble bravura of style. Borromini's great follower, Guarini, out-Heroded Herod, and demonstrated by an *argumentum ad absurdum* the ridiculous consequences of adopting the whimsicalities of Borromini. The brilliant talents of Vanvitelli, and the majestic scale upon which he worked out the immense palace at Caserta tended to maintain the dignity of his art during the greater part of the eighteenth century, and showed that magnificence and grand conceptions of pictorial effect had not yet deserted Italian architecture. From his death in 1773 architecture and ornament also greatly declined, and although monuments upon a large scale have been frequently erected since that period in Italy, but few of them are worthy, in any quality excepting that of scale, to rank with the purer taste of earlier times. The feeble classicisms of the style of the Empire were generally slavishly reproduced in Italy during the early part of the present century, and until comparatively recent days little of considerable merit has been executed. The works of Piranesi, Albertelli, Cicognara and Canina, and the illustration principally by foreigners (such as Percier and Fontaine, Mazois, Grandjean, Famin and Montigny, Gauthier, Letarouilly, Zahn, Gütensohn and Thürmer, Grüner, Taylor and Cresy, Willis and Hessemer) of their great monuments of art, have led to a return to a purer class of architectural ornament than had been previously in vogue; while the earnest writings of the Count Selvatico, and the translation of Rio's "Poesie Chrétienne," have introduced to the Italian architects those rational principles of design, including the treatment of constructive form and of ornament, originated amongst us by the younger Pugin. The great scale of the existing edifices, and the reparations which it has been necessary to make from time to time to save them from destruction, have constantly maintained Italian artisans in the practice of rivalling the ancient work, so that in every department of building hands at least abound perfectly capable of carrying out the most difficult designs.

Restoration of Walls.

For protection against the admission of wet from the top of the walls, much can be done by coating them roughly on the parts invisible from below with a concrete of cement and fine gravel, by resetting loose stones in cement, by filling in with the same material cavities and open joints, cracks, &c., always taking care, as far as possible, to do this in a manner little, if at all, visible from below. In extreme cases, where arches threaten ruin, it may be desirable to go the length of erecting centres below and rectifying them and filling in the joints with cement. When any large mass of a wall threatens to fall, shores should be applied, the foundations examined and strengthened, if necessary, loose stones keyed in, open joints filled and, in very

bad cases, bonded; but this should be done under the eye of a person who has a feeling for the work, both on its own account and as a picturesque object, so as to avoid any unsightly tampering with the old work. The only cases where such is necessary seem those in which the shattered piers or walls are insufficient for the weight they have to bear. In such cases they must be underbuilt, buttressed or propped in the same way. Here it will be best to make the new work rough and of old materials, but in no degree to mask it, but rather to make it manifest that it is only added to sustain the original structure. It is clear that in such cases it will be best to call in an architect, provided he is one who has an earnest care for the conservation of the work and a full appreciation of the value of its authenticity. The importance of applying to the finer details a preservative and indurating solution, if such is to be found, is almost as great as that of the upholding of the masses; the pulverisation of the surface seems in many cases to be going on at a constantly accelerating pace and threatens the speedy loss of the true forms of the mouldings and the sculpture.

Utility and Art.

That theory which would base architectural beauty upon utility and fitness is so far from being satisfactory as clearly tracing the source of the former quality to the two latter, that, instead of removing perplexity, it rather increases it. In direct opposition to such doctrine everyday experience convinces us that so very far from constituting æsthetic beauty, mere utility and fitness contribute very little at all towards it, even in architecture, where, as far as the purpose of building is concerned, they might seem to be not only indispensable but all-sufficient, and afford all the pleasure which the mind can derive from examining and contemplating edifices of any kind. Yet such is assuredly not the case; on the contrary, it is only when it aims at something more than utility, when it indulges in the superfluous or the useless—in short, when it steps into the province of art and aims at the idle gratification of the eye, that architecture is entitled to the high distinction claimed for it and the lofty pretensions set up in its behalf. Upon the utility principle of beauty a turnip-field would be a far more agreeable prospect than any to be met with in Swiss or Italian scenery; and upon the common-sense fitness and utility principle, a church erected according to the Islington or Bethnal Green taste ought to delight quite as much as, if not more than, any of those glorious examples of our ancient ecclesiastical architecture which so wonderfully impress the mind. Unless the word "utility" be exceedingly elastic indeed, and its meaning so ductile that it may be drawn out like gold to a most prodigious extent, utility cannot at all be said to recommend the dome of St. Paul's, it adding nothing whatever to the serviceableness of the building; while, on the other hand, the unsightly platforms or galleries with which churches used to be encumbered ought to be accounted beautiful, since they certainly had the plea of being useful as far as affording sittings goes.

Roman Sepulchres.

Bergier, in his "Histoire des Grands Chemins de l'Empire Romain," in citing the well-known law of the twelve tables, "Hominem in urbe ne sepelito neve urito," seems to hint that the injunction was confined to the city of Rome until the time of Hadrian, who extended it to every city in the Roman Empire, "ne sanctum municipiorum jus polluatur," for that superstition of the Greeks had descended to the Romans, that the town was defiled and polluted in which dead bodies should remain. The Greeks themselves had perhaps borrowed the notion from the Egyptians, whose cities for their dead are, to this day, evidence of the population and importance of those which once existed for the living. The sepulchres for the dead in the Roman times were arranged by the side of the highways, to keep them in the memory of the survivors; and this purpose is neatly and distinctly declared in the inscription on an ancient tomb, erected to one Lollius, and cited by Bergier, which declares that he was buried by the wayside, in order that passengers might salute him with their valedictions, as they passed onward on the road: "T. Lollius, T. Lollii masculus, &c. Hic *propter viam* positus, ut dicant prætereuntes—*Lolli, Vale!*"

Individual Standards of Taste.

It is sometimes asserted that that which pleases is beautiful to the person pleased, and that every one has the right to exercise his own fancy in determining what is or what is not beautiful. This is a fallacy. The abstract right to derive pleasure or gratification from any object, or it may be work of art, may be conceded; but no amount of satisfaction it may possibly afford can endow a work with beauty if it has it not. Nor is every one capable of judging off-hand whether or not this quality is present. In art it is not, as many suppose, merely a question of individual feeling. Certain qualifications are required to form a sound judgment on so subtle a problem. This is especially the case in estimating what constitutes beauty in the human figure, so full of variety in all the conditions of sex, age, strength and character. There must be, in the first place, some knowledge of the construction of the figure and of the laws of action; the power to discriminate between various classes of form; and by practice and careful education of the eye, to know how to compare art with nature in her best aspects, in living models, and thus to determine what it is that artists and poets mean by ideal beauty. It is scarcely saying too much to assert that sculpture, especially in its highest forms, can never be popular in the ordinary sense. To be able to appreciate it, and to judge of its merit as a phase of fine art, a people must have some preparation or education, or they must be so accustomed to see good works, which, indeed, is a form of education, as to be capable of perceiving at a glance what claim it has to notice. In England there is little or no opportunity of acquiring this qualification. Education in the principles of art and in æsthetics is not recognised in our schools or university system. The consequence is most injurious to real and true art, in so much that the field is left open to the very worst and lowest influences, and no surprise can be felt that, under such circumstances, incompetent judges and committees patronise unworthy practitioners, and thus have the dangerous power to place before an ignorant public works that can have but one result, namely, to vitiate the public taste and to depress the standard to the level of inferior productions.

Church Spires.

The origin of the spire, like that of the pointed arch, is merely matter of conjecture. The probability is that it arose out of the peaked roof usually given to campaniles and towers of a preceding period, which form was afterwards gradually improved upon and refined, till it eventually grew up into the slender tapering spire. According to such supposition, we would refer to the tower of Thaon church in Normandy as an example exhibiting the rudiments of the spire, it being no more than a steep peaked roof or low pyramid, whose height does not exceed three-fourths of its base. A peak of this kind differs also from the spire, both in being the same in plan as the tower on which it is placed, and in being immediately set upon it, whereas the spire is almost invariably an octagon or other polygon, and is surrounded at its base with a parapet. In Italy, where campaniles are usually detached square towers of very slender or lofty proportions, the spire is almost unknown, for such towers have seldom more than a mere pyramidal roof or peak, which, though it may be considered as the germ from which the Gothic spire was afterwards developed, is in itself of quite different character; yet, at the same time, that of each is best adapted to the respective style. There are some few instances of square spires, among them a very singular one at Egeln in Germany, where two such spires are set immediately together upon the same tower. But however slender in their proportions such spires may otherwise be, they have a certain heavy massiveness of form. When, therefore, greater loftiness and lightness were aimed at in this feature, the adoption of a polygonal plan for it became almost matter of course, for although in a geometrical drawing the general outline and proportions of a spire are the same whether it be square or octangular in plan, the perspective or actual appearance is widely different, because in the latter case the diagonal breadth of the square tower below is cut off, and each side or plane of which the spire is composed becomes a much more pointed triangle. Besides which, the polygonal spire produces a degree of contrast and variety highly favourable to general effect in the Pointed style.

Pâte sur Pâte.

The name of *pâte sur pâte* explains sufficiently the process which consists in staining the body of the hard porcelain in celadon or other colour by the addition of a coloured mixture, of which oxide of chrome is generally the chief ingredient, and then, when the piece is still in the clay state, to paint or rather model upon it with a brush, using the white body of the porcelain as the pigment, and taking advantage of the transparency it will acquire when fired to produce an effect similar to that obtained in the Limoges enamels by working the semi-transparent enamel on a black ground. Consequently the artist will increase the thickness of the white clay for the high lights, and decrease it where the colour of the ground is to be seen through. Much experience is required to calculate the effect, the white clay before firing being equally opaque in the thin as in the thick parts. Of course any mistake is irremediable, as it can only be seen after the piece is fired. It was from studying the Chinese celadon that Ebelmen started this kind of porcelain. The colours used, on account of the high degree of temperature, are extremely limited. We have already mentioned that chrome was the foundation colour for all the grounds; to this must be added cobalt, nickel and uranium, which are also used to stain the clays when some other tint is wanted in addition to the white. This scarcity gives a slight monotony to the general effect of the pieces.

NOTES AND COMMENTS.

THE restoration of the church of St. Bartholomew the Great, in Smithfield, is making steady progress under the direction of Mr. ASTON WEBB. Since the south transept was opened in March the triforium arches have been opened up, and the roof over the south triforium has been reconstructed, while that on the north side (which has been occupied till quite recently by the boys' school of the parish) has merely been repaired. The Norman vaulting below both of these triforiums, which has been long destroyed, has now been renewed throughout, thus rendering the building much more secure from fire. The opening of the north triforium gives access to Prior BOLTON'S window, the stone sill of which has been worn to a remarkable extent by feet. It will be interesting to know whether archæologists can now add anything as to the probable use of this window. Access to this triforium is by a spiral stone staircase. The old brick tower—which is, in a measure, picturesque and historically interesting—is to be retained, after being strengthened by iron ties, and the copings reset and repointed throughout in cement. A stone porch will shortly be added. The pre-Reformation peal of five bells have been tuned and rehung and set in ringing order. The north transept is to be taken in hand next, all preliminaries regarding the blacksmith's forge and the charity house occupying the site having been completed. This will expose a considerable amount of old work at present entirely concealed, and probably lead to a more correct knowledge of the plan of this part of the building.

THE guides who lie in wait about the courtyard for visitors to the Louvre will not be grateful for the latest innovation. M. GUILLAUME, the architect who has charge of the buildings, has been instructed to prepare two plans of the galleries on a large scale, which will be placed at the entrance of the Pavillon Denon and at the staircase Henri II. They will be tinted in different colours, and will give indications of the principal contents in legible printing. Plans of the kind have been long needed, for the majority of visitors are unable to realise the number of galleries that can be visited. Hence it is that, while the picture galleries and the sculpture halls are occasionally crowded, the range of galleries which contain the discoveries of Monsieur and Madame DIEULAFOY and much else that has interest are left to the attendants. In fact, it would be well to have smaller plans, which could be placed at points where there is a variation from a direct line of galleries, for the Louvre is not half known.

ACCORDING to Mr. DEACON'S last report the progress of the tunnel under the Mersey, which forms part of the works for the water supply of Liverpool, continues to be satisfactory. Out of 805 feet—the distance from the centre of the Lancashire shaft to the centre of the Cheshire shaft—a length of 352 feet was completed at the end of last week. On the resumption of work on November 12 last, after the Corporation had taken it into their own hands, a rate of about 25 feet a week was attained. The rate has since been increased, and last week a length of 49 feet 6 inches was driven and lined. It is probable that about 50 feet a week will prove to be the maximum speed attainable with the old shield, defective in many respects and patched as it is. This is undoubtedly satisfactory progress, but with a new shield, designed by the light of experience gained in this work, there can be no doubt that a higher speed can be obtained, and that the operations could be carried on with little or no risk. The immunity from serious stoppages since the resumption of the work has been chiefly due to the fact that no important disturbance of the strata surrounding the tunnel has taken place. The materials are still for the most part open gravel, sand and silt, crossing the face of the work in ever-varying thicknesses, and so long as they remain unbroken and the shield is simply called upon to cut through them a circular hole 10 feet 3 inches in diameter, the difficulty and danger of driving are reduced to a minimum. The tunnel is now under the deepest part of the channel, from which it is separated by about 22 feet of open water-bearing strata. The depth of water in the channel at high tide is 22 feet, and the head of water at the lower part of the exposed face is then about 54 feet. It is anticipated that the tunnel will be completed in about nine weeks.

AT this season, when imagination is allowed fair-play, many young people will be reading ancient stories in which benevolent beings that are not of human kind appear as actors. But the wonderful fish that appeared this year in Lough Erne, in the North of Ireland, was as great a wonder-worker as many of them, and served archæologists, who in general are not favourites with the "good people." The representatives of the animal kind in the legends as a rule take care to avoid suffering indignity—for pain is out of the question—but the Ulster fish allowed himself to be hooked. As often happens, he then descended to the bottom of the lake, and it was supposed it was only in the sulks. Then there was motion, and the line became entangled in something that was supposed to be a stump. When the fish rose to the surface the men found, instead of a stump, a very ancient shrine. It was secured by the chairman of the Enniskillen Town Commissioners, but whether for public purposes or for his own cabinet is not stated. It appears that on the shore opposite the point at which the shrine was found are the remains of a stone structure—no doubt an abbey—around which there is an irregular square foss, one side of which runs along the top of the steep bank and bounds the shore of the lake. Tully Castle is quite near, and the stones of the abbey may have been utilised to build it. The shrine is 7 inches by $3\frac{1}{2}$ inches, and in height $5\frac{7}{8}$ inches. It consists of two distinct parts, an inner and an outer shell. The sides and the lower parts of the two ends still remain. There are no signs of ornament about it. The outer shrine has a lining of yew wood in two distinct pieces. The greater part of the exterior is plain and unornamented. Below on both sides there are remains of four bosses of which the circular traces still remain. It is needless to inquire about the fate of the principal agent in the discovery. "Patitur qui vincit" has no partial application.

IT is worth recording that the Municipal Council of Paris have at last recognised in an inexpensive way the marvellous powers of THÉOPHILE GAUTIER, who once was known as "le bohème mérovingien de la rue de Navarin." Although, in the days when he was the model for *Jeune France*, he allowed his locks to fall in curls to his waist, and wore vests of crimson velvet and boots of yellow leather, went hatless through the streets, and was a terror to the *quartier* from his experiments in pyrotechnics, in his province as a writer poor THÉO was unmatched. VICTOR HUGO considered he was the only man, after himself, who could write pure French. Many of the painters and sculptors of Paris owed their reputation to his articles, and, like most critics of art, he found ingratitude from the men he created. GAUTIER'S own ambition was to paint pictures instead of writing about them, and his manner of describing things displayed a faculty for the picturesque which, under a different sort of training, might have made him one of the glories of the French school. But he could not become envious through his own failures, or by seeing the success of many artists, and his fondness for bestowing praise grew with his years. GAUTIER did not covet honours during his life; a modest competence, and a seat in the Academy, were his desires, and neither fell to him. GAUTIER'S reputation rests on books and the traditions of his manner of living. Paris is without a statue of him. It is true there is a bust in the dreariest of the corridors of Versailles, but so many figures of nonentities are ranged in that refuge, few visitors have patience to seek out the features of the author of "Mademoiselle de Maupin," "Capitaine Fracasse," "Caprices et Zigzags," and many other masterpieces in prose and verse. As he once wrote "le buste survit à la cité," perhaps the Parisians consider that GAUTIER should not be commemorated by a work of sculpture, in case their city became a ruin. At any rate, in his case they have adopted the more economical plan of naming a part of one of the suburban highways after him. In Auteuil a section of the Rue du Point du Jour is henceforth to be known as the Rue Théophile Gautier, and so great a distinction ought, it is supposed, to satisfy the shade of the French GOETHE.

MANSFIELD HOTEL
MANSFIELD HOTEL
INK-PHOTO SPRAGUE & Co. 4 & 5 EAST HARDING STREET FETTER LANE

House at Eastbourne.

for Dr Arthur Oakes.

Louis Ambler A.R.I.B.A. Archt.



Second Floor Plan

The Architect, Dec. 25th 1891.

INK PHOTO SPRAGUE & Co 4 & 5, FAST HARDING STREET, FETTER LANE, E.C.



INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E C

S. MARY-LE-STRAND.

JAMES GIBBS, Architect.



INK-PHOTO SPRAGUE & Co. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

CENOTAPH, FOR MELBOURNE, AUSTRALIA

WALDO STORY, Sculptor.

E. PRIOLEAU WARREN, Architect.



VIEW FROM SOUTH-WEST



VIEW FROM NORTH WEST [IN PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.]

COTTAGE DISPENSARY, WALTHAM ST LAWRENCE, BERKS.

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NO. 446.—LOCAL BOARD OFFICES, BRENTFORD.

NO. 447.—CHURCH OF ST. MARY-LE-STRAND, LONDON. [J. GIBBS.]

CENOTAPH FOR MELBOURNE, AUSTRALIA.

THE bust in statuary marble, which forms an important part of this cenotaph, is Mr. STORY'S work, and was executed in Rome. The frame is in English red alabaster, with red marble columns and panels. The heraldic devices in white alabaster are painted in proper colours and gilded. The carving was done by Mr. LAWRENCE TURNER; the decoration by Mr. H. A. B. SMITH; Mr. E. PRIOLEAU WARREN was the architect. The monument is to be erected on the wall of a church at Melbourne.

HOUSE AT EASTBOURNE.

For description see page 351, December 4.

COTTAGE DISPENSARY, WALTHAM ST. LAWRENCE, BERKS.

THE cottage contains a parlour-kitchen, with scullery and offices, a dispensary and a waiting-room on ground floor, and three bedrooms above. The ground-floor walls are 14 inches thick; those of the first floor half-timbered. The cost was about 540*l.* The work has been carried out by Mr. J. B. SEWARD, of Wokingham, for Mr. W. LANDSDOWNE BEALE, Mr. E. PRIOLEAU WARREN being the architect.

MANSFIELD HOTEL, GOSPEL OAK, N.W.

THIS building has been erected on the site of the old hostelry which was known for many years as the Old Flat Iron, named through the peculiar shape of the site on which it stands, and is situated at the junction of Lismore and Mansfield Roads, Gospel Oak. The whole of the ground-floor is faced with Aberdeen and Dalbeattie red and grey granite, and the upper part is of Boreham red bricks and Coombe Down Bathstone, relieved by pilasters, &c., of Lawrence's Bracknell rubbers. The ceiling of the bars is of enamelled iron supplied by Messrs. SIMPSON & Co. The whole of the internal fittings are executed in Cuba mahogany. The gasfittings and ornamental ironwork and grills, &c., have been carried out by Messrs. WYKEN & Co.; the pewterers' work by Messrs. SANDERS & SONS; the whole of the glazing by Mr. H. CONOLLY; the tiling by Messrs. CARTER, JOHNSON & Co.; the constructional ironwork by Messrs. LINDSAY & Co., and the carving by Mr. GILBERT SEALE. Mr. L. F. LUNDY, of Shepherd's Bush, carried out the building contract from the designs and under the superintendence of Mr. ALBERT E. PRIDMORE, architect, of 2 Broad Street Buildings, E.C., and Watford, Herts.

EDINBURGH ARCHITECTURAL ASSOCIATION.

A MEETING of the Edinburgh Architectural Society was held last week. Mr. James Bruce, W.S., moved:—"That this Association, as taking a deep interest in the careful preservation of the ancient buildings of Scotland, particularly of those in and near Edinburgh, has observed with great satisfaction that the Most Honourable the Marquis of Lothian, Secretary for Scotland, has recently been personally present at an examination of the present condition of the Royal Palace of Linlithgow, which has been in a roofless state since the fire of 1746; that the Association feels that the buildings of the palace are presently in a critical state, and expresses a hope that without delay such steps will be taken by Government as will prevent the further internal decay of the palace through exposure to the weather, and remove the immediate risk of the masonry falling, and thereby causing serious destruction to the remainder of the fabric." In submitting his motion, Mr. Bruce spoke of the dilapidated condition of certain parts of the palace, and of the great loss which Scottish historical and architectural art would sustain if means were not taken to preserve the structure. Mr. Thomas Ross, architect, in seconding, stated that the present state of the palace was simply deplorable from a historical and architectural point of view. The motion was unanimously adopted, and it was agreed to forward copies of it to the First Commissioner of Her Majesty's Works, to the Secretary for Scotland, and to the Lord Advocate. Mr. G. Aitken, architect, gave notice of a motion in favour of the removal of the Wellington Statue from its present site, on the grounds chiefly that it was now an obstruction to the thoroughfare, and that it was incongruous with its surroundings. Mr. J. M. Gray, curator of the Scottish National Portrait Gallery, afterwards read a paper on "Sir Henry Raeburn and Portraiture in Scotland." Having, towards the outset, pointed out the historical value of portraiture, Mr. Gray remarked that in Scotland the usual sources of portraiture were sepulchral slabs and brasses, illuminated manuscripts and coins, and sometimes charters. Dealing specifically with painted portraiture, Mr. Gray described as one of the first great examples, splendid as a specimen of religious and art portraiture alike, the altarpiece of Trinity College Church, Edinburgh, now preserved in Holyrood, one of the finest examples of early Flemish art in Britain, and certainly by far the finest in Scotland. Then Mr. Gray treated of the portraiture of Queen Mary's time, taking particular note of portraits of the ill-fated queen herself. There was no doubt, he concluded, as to what Queen Mary was really like, though as most of the artists who portrayed her were comparatively poor painters we did not realise the beauty and loveliness attributed to her, but had, as it were, a map of her features. Mr. Gray next directed attention to some of the leading Scottish portraitists of succeeding centuries, giving particular notice to George Jamesone, William Aikman and Allan Ramsay the younger, until he came to Raeburn, the Scottish portraitist, said the lecturer, in whose best work they found almost at its highest the purely æsthetic value that came from technique, from the masterly use of material, and one in whom they found this purely sensuous charm united to the very utmost value of record. No other Scottish portrait-painter was worthy to stand by his side. The only other Scottish artist fit to be named in the same breath was a genre painter, David Wilkie. On the motion of Dr. Marshall, seconded by Mr. James Orrock, R.I., Mr. Gray was thanked for his paper.

THE SHREWSBURY BATHS COMPETITION.

THE Baths Committee of the Shrewsbury Town Council have reported that having carefully considered the plan to which the first premium was awarded by the Council, they were of opinion that some slight alterations might with advantage be made, and the cost of the baths reduced. Having conferred with the architect, he at once fell in with the views of the committee, and considered the suggestions made would be an improvement in every way, as well as a saving of 500*l.* At the committee's request Mr. Johnson has prepared a set of amended plans, which, while maintaining the features of the accepted design, differ in some minor points, such as the following:—One pay-office is provided instead of two, so as to economise in the cost of management. Second-class bath to be the largest, and arranged so that swimming contests and other entertainments may take place in it. A gallery will be provided, also two additional exits for use on special occasions. The committee are satisfied that it is not advisable to reduce the length of the baths, but think that 30 feet is ample for the width, and it will be noticed that in the amended plan this reduction has been made. The committee unanimously recommend that the plans now submitted be adopted, and the necessary steps taken with the view of proceeding with the work as speedily as possible. It is also recommended that Mr. John Johnson, of 9 Queen Victoria Street, Mansion House, London, the author of the selected design, be engaged as architect, and instructed to prepare the necessary working drawings and specifications for obtaining tenders, and that for this and attending to and being responsible for the erection of the baths, he be paid the usual 5 per cent. commission (to include the premium of 50*l.*), together with the usual travelling expenses. Mr. Johnson undertakes to bear the cost of the alterations in the drawings, and the committee think, under the circumstances, it is only equitable for his travelling expenses to be repaid. The following is Mr. Johnson's report:—

9 Queen Victoria Street, Mansion House,
London, E.C.: December 4, 1891.

Dear Sir,—Having conferred with the Baths Committee, I beg to forward plans amended in accordance with their views, in which I fully agree, the alterations being improvements, besides lessening the cost from 7,000*l.* to 6,500*l.* The simplicity of the general scheme is maintained, and accommodation provided much beyond the original requirements, which I may mention for comparison:—

Required.—First-class swimming-bath, 75 feet by 35 feet, equal to 2,625 feet area; second-class ditto, 60 feet by 30 feet, equal to 1,800 feet; total water area, 4,425 feet. First-class gentlemen's private baths, 3; second-class ditto, 2; first-class ladies' private baths, 4; second-class ditto, 2; total 10.

Provided.—First-class swimming-bath, 75 feet by 30 feet, equal to 2,250 feet area; second-class ditto, 90 feet by 30 feet, equal to 2,700 feet area; total water area, 4,950 feet. First-class gentlemen's private baths, 4; second-class ditto, 5; first-class ladies' private baths, 4; second-class ditto, 5; total, 18.

By having only one pay-office, the cost of management is reduced, and all entrances are under observation. A large entrance-hall is now provided, which will be most useful when swimming and other entertainments are given. The reversal of deep ends of swimming-baths will place the shallow ends next the entrances, and the laundry portion will be available for retiring-rooms when desired. The gallery is arranged to second-class bath, that now being the larger, and two additional exits provided. The first-class swimming-bath when used by ladies can be entered without passing through gentlemen's waiting-room, and altogether the amendments will result in the production of a building admirably suited in every way for the intended purposes.—Yours faithfully,

John Johnson.

The recommendations of the Baths Committee were approved by the Town Council.

FRENCH ARCHITECTURE.*

By Sir Frederick Leighton, P.R.A.

(*Concluded from page* 378.)

I SPOKE just now of the peculiar charm and splendour which is bestowed on the French churches by their stained-glass windows. But another element of dignity was added to them by a wealth of sculpture, on which time will not allow me to dwell. It must suffice to say that while the carver's art in France was during the Gothic age prolific beyond example, it early reached and throughout maintained a high standard of excellence. It was everywhere full of sincerity and freshness, often of great beauty and stateliness, and always in its application marked with a strong sense of fitness and artistic propriety. Sparingly used in the interior of the churches, in which a noble restraint invites to grave and silent contemplation, it spread with unstinted, though well-marshalled, profusion over their external features. The sacred edifice thus challenged the passer-by through its manifold magnificence; and this alluring wealth was most widely spread about the portals through which the faithful were to be drawn.

But even as the stability of a Gothic church rested on a nice poise of mutually counteracting forces, so the maintenance of the style itself at its perfect point depended on a due balance of the intellectual forces which had generated it. This balance was soon to be disturbed. The fascination of the statical *tour de force*, the craving to bring down to an irreducible minimum the amount of material that would suffice to the stability of a building extravagantly lofty, was irresistible. Mathematical calculation played a daily more absorbing part, and resulted in the rearing of such a structure as the choir of Beauvais, which, presuming too much on abstract calculation, was so lacking in solidity that it gave way within a few years of its erection, was rendered relatively stable only by doubling the number of its supports, and is held together to this day only by a network of iron ties—a building which distresses by its stilted and meagre aspect and lifts its vault to such a height that the eye cannot be directed to its summit without considerable physical discomfort. Another, no doubt in its way beautiful, church which exemplifies the training down of constructive forms to the last extreme of attenuation is St. Urbain of Troyes, in which the flying buttresses have the skeleton meagreness of iron girders, and the principle of external props is carried so far that two tiny vaulted porches at the north and south entrances think it necessary to provide themselves with flying buttresses standing out at either angle on the pavement. This building has the further peculiarity that it seems by some fissiparous effort to have split its substance into two layers, as though the outer church had been shed, so to speak, leaving another inner one intact and complete. Again, you will see that by the elimination of all idle portions in a structure of which the active portion is a skeleton, line becomes dominant through the omission of planes; lines were soon needlessly multiplied; narrow ridges first ran up the faces of the shafts, and then, as if convexity of surface was in itself a culpable waste, what had been a shaft was hollowed into furrows divided by an arris; concavity and rigidity invaded everything with an exasperating angularity of effect. Of this you may see an illustration in the cathedral of Auxerre, where the choir retains the fuller forms and those of the nave shrivel into concavity.

But if the causes we have noted led, in structural forms, to a rigid multiplicity of vertical lines, exterior decoration, which rapidly grew in exuberance, gave scope to that love of sinuous serpentine forms, born of a sense of the grace of motion, which has always marked the French, and, whilst vertical constructive lines multiplied themselves in the interior of the churches, an incontinent exuberance of fantastic curves began to spread over their exterior surface, clothing them with an embroidery of wildest decorative fancies. In this development of what became in the end an uncontrolled orgy of the chisel, the first step was a breaking-up of the tracery of the windows and a substitution for geometric forms of a flame-like—flamboyant—arrangement of curves, both picturesque and graceful, but wanting in the dignity and fitness of the earlier device. Meanwhile, into whatever excesses the French carvers were betrayed at this period of Gothic art, the vivacity and spontaneity of their genius ever light up their work and disarm criticism. We feel throughout that, with whatever redundancy and mannerisms, they are expressing themselves sincerely and in their own vernacular. How necessary to all excellence is this cardinal virtue of sincerity will be borne in upon you if from the façade of this cathedral of Troyes you turn to a famous rood-loft in the church of the Madeleine in the same city, the work of one Giovanni Gualdo, an Italian, who, being buried beneath it, declares in his epitaph, not without some boldness, that he will not be found crushed when he is called to judgment. This rood-loft is of extravagantly flamboyant character; but whilst the work of the French carvers at the cathedral is instinct with living grace and power, the genuine expression of something spontaneously conceived, the work of this Italian, which was not a natural utterance, is, like all Italian Gothic detail, intolerably clumsy and coarse, to a degree which would be perplexing, in view of the amazing beauty and subtlety of Italian handling in Renaissance ornament, if we did not remember that the latter was with them a sincere and natural mode of expression.

Gothic architecture, though it continued till late to produce fine work, had lost its perfect balance already before the close of the thirteenth century; it had forfeited also some of that rich personality which marked it before it had become to some extent a matter of recipe in the hands of the Freemasons. Nevertheless, however little scope it found during the disastrous period of the English wars, it held its own with the vitality of an indigenous growth, and, as we shall see, fought long and manfully with the new ideas in the days of the sudden swinging back to Italian influence of which I shall now have to speak.

But before leaving this branch of our subject I will venture to note an instance, as I think it, of the fine tact of the French church-builders, namely, their adoption, which I cannot regard as fortuitous, of the circular east-end, the "chevet." Mr. Fergusson, indeed, sees the source of the French ground-plan in the addition of a nave to an original circular building; this ingenious explanation does not, I think, offer an adequate solution. It seems to me but just to give full credit to the French builders for the higher fitness of any form they adopted. How beautiful a square east-end may be we in this country abundantly know, but it is difficult to divest oneself of the feeling that a church so terminated is a more or less arbitrarily truncated arcade which might be produced indefinitely; in the circular arrangement, on the contrary, not only is the design more visibly closed, but every limb of the encircling bays strives back, and is gathered up into a key suspended immediately above and emphasising the holiest spot, the altar of the sacrifice.

And now we turn to a wholly new phase in French art, the expression of a new order of ideas and of materially altered social conditions. During the fourteenth and fifteenth centuries the prestige of the fighting nobility had suffered much through the introduction of artillery and the reverses of the English wars; the middle classes, on the other hand, had under the favour of the kings steadily risen in importance. Before the end of the fifteenth century the printing press had begun to scatter knowledge far and wide. The discovery of a new continent across the Atlantic was stirring the imagination of the Old World. But it was a discovery within that Old World which was to exercise the deepest influence on the intellectual condition of France, the discovery of Italy, through the expeditions of Charles VIII. and Louis XII., for a discovery it may be called, though it must not be assumed that Italian influence was entirely absent in France until that period. Already in the middle of the fifteenth century René of Anjou, himself a painter and the friend of the leading humanists of his time, had made his court at Tarascon a centre of culture and of art, and employed the labour of Italian artists. Within the first half of the century, too, a great painter, Jehan Fouquet, had brought back from Italy a marked leaning to the new classic spirit. Nevertheless it was not until the return of the romantic stripling Charles VIII. with the flower of the French nobility from his futile and fantastic campaign that the desire for all things Italian took wide and lasting hold of the French—at least, among the nobility—and this enthusiasm, further whetted during the chequered campaigns of his successor, Louis XII., grew at a rapid pace. It was not, however, till the second decade of the sixteenth century that through the example of that brilliant *dilettante*, Francis I., the Italian contagion

* An address delivered to the students of the Royal Academy at the distribution of prizes on the 10th inst.

showed important results. Within the thirty-five years of his reign a host of palatial buildings were raised in a new style, which, if it had not, as had the style it pushed aside, the virtue of indigenous growth, was certainly marked by extreme charm and beauty. It was not, I say, of spontaneous growth, but neither was it a wholly alien product, for the people from whom it was adopted had in past times left on the more vivacious Gallic stock distinct traces of its blood, and the French have not ceased to this day to claim kinship with the Imperial race.

Meanwhile, borrowed though the new style was, the French at once moulded it to their own genius and produced a result distinctly personal to themselves, and the modifications they introduced in the Italian style were just such as you would expect from the different temper of the race. The restrained and sweet gravity which delights us in the purest examples of trans-Alpine Renaissance is, it must be admitted, too often wanting in the French work of the same class, and if, as I believe, the rank of a work of art is according to the dignity of the emotion it stirs in the beholder, then the creations of the great Italians rise to a higher level than those of the artists of the French Renaissance. For vitality and variety, on the other hand, for exuberance of fancy, for resourceful ingenuity of construction and for a delicate sense of rhythm and proportion, the superiority of the work of the French is, in my opinion, conspicuous. Above all things it is their own, and for this reason it seems to me that the jealous investigation which has been noticeable in recent times in France, as to how far Italian artists have been unduly credited with the building of certain of the masterpieces of the Renaissance in that country is, however valuable in the interests of truth, of no great moment to the dignity of French art. Close study of documents has led, as is well shown, for instance, in Palustre's beautiful instalment of a "History of French Renaissance," to the dismissal of claims hitherto advanced in various cases in favour of Italian artists; it is bringing into greater prominence the names of native *maistres massons* whose claims had been underrated, men who had inherited traditions which made them greatly superior, as builders at all events, to the artists who came amongst them from beyond the Alps. But, apart from such inquiries, it is patent that all but every work of the French Early Renaissance, however it may have originated, bears the unmistakable stamp of the fusing energy of French genius. That the style was not born in France is a fact no one can challenge; that it was recast in that country into a distinctly French thing no narrowness could dispute.

The keynote of the Renaissance movement being the assertion of the beauty of life and the dignity of man, its influence was naturally most felt in connection with secular life. The great era of church building was past, and, indeed, for a population reduced by long and wasting wars the existing places of worship were not insufficient. The main determining motive of artistic activity under Francis I. was the ambition of the king and his nobles to multiply places of delight for their residence, especially in the country, and to replace by sights of beauty, such as they had learned to love and covet in Italy, the moated gloom of their ancestral châteaux, built and well-suited for purposes of protection and defence, but little in harmony with the tastes of the pleasure-loving court and the lighthearted young king who led it. Prodigious and breathless was the activity with which châteaux were raised, first in the royal province watered by the Loire, and then in and about Paris. It would be fruitless to enumerate at length even the chief of the stately buildings, which from that time to the death of Henri III. occupied the energies of French architects; nor can I do more here than name a few of the foremost of these considerable men, such as in the first line Jean Bullant and Philibert de l'Orme; and in the second, Colin Biart, Pierre Chambiges, Pierre Nepreu (*alias* Trinqueau), Gadier, Le Prestre and Hector Sohier. It will be more profitable to note a few points in connection with the evolution of the style itself. Although, as I have said, the great outburst of activity in the new direction coincides with the reign of Francis, Italian influence had already begun to assert itself in architecture as in other things in the preceding century, through Charles VIII. at Amboise, for instance, and more effectually under his successor, who built the east wing of the Château de Blois, and whose great Minister, Cardinal d'Amboise, raised near Rouen the magnificent château of Gaillon, known to us now through a few fragments only, and the precious work of Du Cerceau. In these buildings, however, the French and the Latin elements are jumbled into a pasticcio rather than fused into a whole. As an interesting example of this confusion, I will instance the period of the Ducal Palace at Nancy, in which the decorative magnificence of the whole design palliates the maddest marriage of heterogeneous forms ever conceived in an artist's brain.

It is interesting to observe the attitude of a people possessing great building traditions and very definite æsthetic propensities, in the face of an innovation imposed on it, in a manner, from without, but stimulating to its sense of beauty and its appetite for the new. Two influences were adverse to the new fashion—first, the spirit of the men of the burgher class, who clung to a style identified in their minds with their nationality and the growth of their liberties; and secondly, the conservative attitude of the Church, jealous of an art so secular in its inspiration, tenacious, too, of a tradition of building closely bound up with its history and exactly moulded on its needs. We see accordingly on the one hand the municipalities continuing for some time to build their public halls on the old lines, and on the other the clergy erecting Gothic churches well into the sixteenth century, and retaining the structural dispositions of ogival architecture even after the outer forms of the Renaissance had been accepted for sacred buildings. It is, indeed, not a little curious to see so logical a people, while holding firmly to their old methods of construction, consenting to abandon forms which had grown out of those methods, and were, in fact, the emphasised expression of that construction. We see with amazement edifices constructed on the basis of a predominance of the vertical line piled up painfully with tier upon tier of parts taken from a style based on the opposite principle. No talent can redeem so deliberate a violation of every fitness. As might be expected in the first efforts of Renaissance building in France, the Classic orders were used in no very scholarly fashion; they were, however, it must be owned, handled and applied with a delightful sense of the picturesque, and, if severity and simplicity are often wanting, an altogether surprising alertness of idea and fertility of resource are manifest on every hand. In the case of secular buildings the transition from the later Gothic was facilitated by the fact that squareheaded openings prevailed already in that style, of which, too, the incontinence in ornament was acceptable to the exuberant spirit of the new art. The character of that ornament, however, was entirely changed; fantastic, foreign arabesque took the place of the floral decoration which had been one of the glories of the French school. Meanwhile the love for aspiring forms lived on, and the tendency to complexity died hard. The wealth of skyline produced by spires and pinnacles was perpetuated in high-pitched roofs, turrets and tall buttressed dormer windows. The skyline of Chambord could have been conceived only by an architect having Gothic tradition in his blood. In other matters, too, we find the Gothic habit surviving. The external winding staircase, for instance, was long preserved, and you may see on a dainty façade of the time of Francis I. the survival of the grouped shaft in a fanciful colonnette engaged on the face of a pilaster. But most interesting to observe is the tenacious struggle of the vertical line throughout French Renaissance architecture. "The Orders," with their bold entablatures, did, it is true, compel some stress on horizontal lines, though we shall see later how this restraint was in part evaded, but their effect was at once balanced by an emphasised vertical grouping and uniting of the openings in the different storeys, and by projecting wings, towers and pavilions, which marked with perpendicular lines of shadow the elevation of the French buildings.

Of the first period of the style the finest example is undoubtedly the south-west angle of the court of the Louvre, by Pierre Lescot—a great artist, though he may not wholly justify Ronsard's hyperbolic eulogy—a building made doubly stately by the fact that the reliefs which so richly clothe it are due to the hand of Jean Goujon, who, with Germain Pilon, marks the highest level of French plastic art in the sixteenth century. These reliefs display, like those from the same hand on the Fontaine des Innocents, in a marked degree that conspicuously French quality, the sense of the decorative properties of line and form. By this time the knowledge of Classic art was becoming more thorough and the application of its features more correct, and with a more Romanising spirit, if I may so call it, a tendency to larger forms grew up; so, at Ecouen first and later at Chantilly we find Jean Bullant introducing what was called the *ordre colossal*, an order, that is, embracing the whole height of a façade. A greater aspect of strength and stateliness no doubt attached to this new disposition, and the dying out of Gothic traditions of common sense blinded him to its inherent incongruity. But even in adopting this purely Roman device his Gallic blood prompts him irresistibly to a flouting of the horizontal line. He does so with curious thoroughness in the pavilion which bears his name at Chantilly. Not only does he here omit any line hinting even at a division into floors, but of the windows in the upper and lower storeys, which are compacted into groups of vertical designs; the lower plunge downwards through the base which carries the order, and the upper, breaking audaciously through the broad entablature of that order, lifts itself bodily and to nearly half its height into the roof. A most corrupting spectacle, my young friends, I fear, for justice bids me add that the effect is very pleasing. Thus genius, but genius only, redeems what in mediocrity would seem a sin. But Bullant was yet to be outdone, for in the design of the inner court of Charleval, a work begun under Charles IX., but never carried out, and known to us only through Du Cerceau, who speaks of

it with extravagant praise (Lübke suggests that he may have designed it himself), we see not only the same omission of floor-line, but actually niches with statues so introduced that they cut across the exact spot where the floor lies, so that an effort of reflection is required to assure us that a floor can exist there. Philibert de l'Orme, the learned and courtly engineer, architect and writer, was, as far as we can judge from the fragments of his work which survive and the knowledge we have from Du Cerceau of his designs for Anet and the Tuileries, an artist of well-balanced mind and scholarly training, whose conceptions are marked by dignity and refinement, but in whom the stamp of genius is not so evident as in the less cultured Bullant. Anet, with its wide courts, its palatial distribution and its rather frigid triumphal archway must have been impressive and stately; of the design for the Tuileries, on the other hand, I am unable to form a favourable opinion. On either side of a pavilion, not itself, I think, very happy in design, abuts without evident connection a low building in which a crowded attic of unfortunate proportions rests immediately, nothing intervening, upon an arcade, very handsome and dignified in itself, but calculated to carry a palace and not a highly decorated garret. It is as if you should place a hat on a pair of legs and offer the result as a man. To De l'Orme is due the introduction of what is called the *ordre français*—a column of which the fluted drums are divided by ornamented bands.

But the days were near when the light of creative genius in art was to burn low. The days of civil strife and butchery in which so many noble lives were quenched in blood, the dark days of the Huguenot persecution were not auspicious for the growth of art, and with the close of the century we find life and spontaneity at a low ebb—little production, a tendency now to heavy monotony and now to baroque redundancy, and a lack of sense of fitness which admitted of masking with a ponderous Classic façade churches built on the scheme of, if not with the forms of, ogival architecture. Officialism, too, in artistic matters was at hand, and soon that implacable organiser Colbert was to regulate the arts, also by royal decree, and to found an Academy which admitted only one saving creed. The frigid pomp, the artificial graces of the structures inspired by the "Roi Soleil"—majestic in the many-storeyed wig which encircled his retreating brow—how far are they from the radiant daintiness, the joyous freedom of the palaces and pleasances which sprang up in the days and at the beck of that truly sunny sovereign Francis I.?

How architecture fared in the following century, "the Grand Siècle," I have already suggested. The same taint of inflated monotony which prevailed in the works of the builders spread also to painting. Dull already in the hands of Simon Vouet and Sebastien Bourdon, it reaches the height of turgid pomposity with Charles le Brun, a mighty personage in his day, who controlled autocratically nearly all the artistic production of the France of Louis XIV., and whose magnificent energies, be it owned, seem in these punier days to border on the fabulous. Let us not forget, however, that the gentle Lesueur worked also in those days, and that during the epoch of which the towering wig seems the symbol and the epitome, an artist like Nicolas Poussin found in the large, sad silences of the Roman Campagna the inspiration of his grave and noble works, and that, far from Paris, Claude Lorrain enshrined on canvases that will die not the poem of the setting sun. In the sculpture of the great reign the mannerism caught from Bernini prevailed, but it cannot veil from us, though it sorely mars, the fiery genius of the Provençal, Pierre Puget.

Time suffers me to do no more than glance at the revulsion which followed the death of Louis XIV. The reign of his successor is not one of great architectural activity; it is best mirrored in the minor arts that minister to the comforts of life. The doctrine of discipline and restraint yields now to a new gospel—the gospel of indulgence and ease. A sprightly daintiness presides over all artistic production. The difference between the two reigns is the difference between Madame de Maintenon and Madame du Barry; and the utter relaxation of all restraint in life is curiously featured in the forms imparted throughout to every inanimate thing which is capable of receiving shape. The sinuous curves which already in the days of the Flamboyant style had pushed aside the severer and more noble lines of the perfect Gothic, and had in their turn been held in check by the Latin spirit in the earlier days of the Renaissance, broke bonds when the grave closed over the solemn monarch, and first in France, and then throughout the width of a mimicking Europe, ran riot in the domain of the applied arts. A senseless writhing of unmeaning curves held carnival from that date over every object of use or ornament, and so identified have these forms become with a certain elegance of social *ton* that the most favoured classes all the world over see in them to this day the last word of elegance and taste. You could have no better proof of the lack of all sense of the congruous in decoration than this adoption by society in our time of a style which is the exact mirror of a time so widely different. Yet even in those days of rapid mannerism there were men who escaped the general taint. In architecture a noble severity commends the works of Soufflot and Servandoni, and in painting Chardin employed his delicate gift in the rendering of simple scenes of homely life. But the truest interpreter of whatever was gracious and dainty in this artificial epoch was that greater painter, though not truer artist, J. B. Watteau, whose name is the last I shall bring before you to-night. We find in his work, indeed, no high ideal, no strong imaginative fire—how should we find them seeing what he portrayed?—but in the vivacity and grace of his drawing, in the fascination of his harmonies, rich and suave at once, in the fidelity with which he reflected his times without hinting at their coarseness, this wizard of the brush remains one of the most interesting as he is one of the most fascinating masters of his country's art.

Is there any lesson that we may draw from this hurried survey of artistic evolution among the French? I have dwelt with emphasis on the genius of their Mediæval builders; do I advocate—the young architects for whom I have mainly spoken to-night may ask—do I advocate the adoption of Gothic forms for the purposes of our own lives? I have spoken to little effect if my answer can be doubtful. Artistic forms are the vesture of ideas and the expression of mental conditions; the ideas and mental conditions of our day are widely removed from those of the Middle Ages; the modern mind cannot with fitness put on the garb which was moulded on the mind of a day long past. But if we may not fitly adopt those forms, we cannot too reverently note the spirit which presided over their development, for a like spirit brought to bear on other material and under other conditions may yet bear new and noble fruit. And the characteristics of that spirit are—a masculine independence, a tenacious grasp of central principles, a fearless sincerity in expression, a scorn of shams and trust on truth.

ELECTRIC LIGHTING OF HOUSES.

At the second ordinary meeting of the Dundee Institute of Architecture, Science and Art, Mr. F. Grant Ogilvie, principal of Heriot-Watt College, Edinburgh, delivered a lecture on "Electric Lighting of Houses." Mr. Charles Ower presided. Mr. Ogilvie began by referring to the nature of electric light, and detailed some of the principal facts in relation to electricity which would have to be dealt with in its distribution in houses. He explained how the wire, heated by the electric current, gave off light, but at the same time, when made of certain metals, would melt. The lecturer then demonstrated the manner in which an electric lamp gave out light. The filament in the lamp, being made of carbon, glowed when the current was passing through, and during the process particles of carbon were thrown off, and in time the filament became thinner and thinner until it broke. The average life of a lamp was about 1,000 hours burning. The lecturer then explained the uses of the electric battery, and the signification of the electrical terms ampère and volts, which signified the strength of the current and the difference of electric pressure. By means of diagrams shown on the blackboard with coloured chalks, Mr. Ogilvie represented how electricity could be distributed in houses. The two wires were brought into the house, the one being at an electrical pressure of 100 volts above the other. These two wires were connected by another passing through the lamp, which glowed when the electric current was passed. The fittings for the distribution of the electricity were, he said, of importance. The conductor of the electric current was of copper or an alloy of copper, and to prevent electricity escaping from one wire to another, or into the material of the wall, the copper wire was entirely surrounded by some substance which offered great resistance to the flow of electricity. The way in which wires could be carried over a house was then detailed, and the use of the switch for turning on and off the current minutely explained, a switch being handed round among the audience to clearly show how it acted. It was usual also to have a wire not copper, which formed part of the circuit, and which was of a substance easily fused. The object of this was to prevent any accident occurring in the event of some unforeseen contact between the two wires. This fusible piece of wire prevented the possibility of such an accident, as should such a mishap come to pass the wire fuse and the whole connection were rendered useless. A number of electric lamps suitable for fixing in different positions were exhibited to the audience, and Mr. Ogilvie remarked that it was the exception now to find an ugly electrical fitting. The lecturer at the close referred to the cost of electric light, especially as compared with the cost of gas, and by means of calculations demonstrated how the different prices might be arrived at and compared. Though gas was cheaper than electricity the waste of the latter was very much less, as more gas was used than was actually required. A switch provided in a convenient place at the door of each room would enable one to turn the electric light on or off as desired. The great qualification of electric light, how-

ever, as compared with gas, was that it did not in any way alter the chemical condition of the air. Electricity heated the air, but did not burn it to vitiate it in any way, and the vitiation of the air by gas was the very thing which was to be counterbalanced in the additional price of electric lighting.

THE ANTONINE WALL.

THE monthly meeting of the Glasgow Archæological Society was held on the 17th inst. The subject before the Society was the Antonine Wall, on which four papers were prepared to be delivered as the result of the recent investigations. Mr. William Jolly read the first paper, on "The Exploration of the Antonine Wall: Third Report." He said that a very large number of cuttings had been made, rewarding them with new and valuable insight into the problems involved. The most of the excavations had been made right through from the military way, through the vallum, across the ditch, and through the northern mounds. In the course of his lecture he explained the results obtained at the various points. The chief work was the excavation of the vallum. It became a very important question what was the purpose of the stone structure in its centre. It was suggested that it represented a roadway, but he proved that it was only the basis of the vallum, and consisted of one layer of stone. According to former explorers the vallum was composed of the *débris* taken out of the ditch. He claimed that the chief result of their inquiries was that they had proved that it was built of turf, which was as well laid as the stones of the Hadrian murus. The rubbish from the ditch had been thrown on the northern side to compose the mounds. The breadth of the vallum was 14 feet, but in the course of ages the material had fallen over each side to the extent of 5 feet, making the breadth appear to be 24 feet. As regards the height of the vallum they could only conjecture, but he pointed out that the sentry on the top of the vallum must necessarily have seen the foot of the ditch, otherwise the ditch would have acted as an ambush. The height might have thus been 12½ feet. The second paper in relation to the wa l was "The Vallum, Berm and Fosse—their correlation," by Mr. P. Macgregor Chalmers. He showed that the Roman fortification was designed in strict accordance with the principles of construction. The outline of the fosse was determined by the natural slope of earth. It was shown that the berm, or platform between the vallum and the fosse, was a serious defect, but that it was a necessary feature in an earthwork, and was designed to support the vallum. The relation of the southern slope of fosse to the height of the vallum was also described. The third paper was on "The Theory of a Berm between a Rampart and its Fosse," by Mr. James Lang, and explained the military purposes which were served by a berm. It was a necessary provision in those days from the military point of view, when it was important to keep the attacking force as far from the wall as possible. Mr. George Neilson's paper was the fourth prepared on the subject, and it was on "The Purpose of the Periodic Expansion on the Antonine Wall." At frequent intervals there occurred short circular bulges of the same extraordinary appearances as the vallum. These had now been proved to be of the same substance as the vallum—that was to say, made of sods, as the dark lines running through them indicated. His belief was they had been the stances for the *ballistæ*, which, according to a Roman historian which he quoted, threw a round projectile, and he referred to the fact that round projectiles had been found in the vicinity of the wall.

MYTHE BRIDGE.

IN the list of iron bridges by Thomas Telford will be found one that is described as "Tewkesbury Bridge," which was completed in April 1826. It consists of a single arched span of 170 feet, the rise being 17 feet and the width 27 feet. There are six cast-iron curved ribs, each being 3 feet deep, which were cast in lengths of 22 feet. The iron used was Shropshire No. 2. The ribs are connected by a lattice framing that forms spandrels with the roadway bearers.

The bridge is known in the district as Mythe Bridge, and since November 1 it has been opened free of toll. Last week there was a celebration of the event in Tewkesbury. From a history of the bridge by Mr. Papps it appears that in 1823 an Act of Parliament was obtained which granted powers for raising money for the purpose of bridging the Severn at the Mythe, and for making the necessary roads. The Severn at this point is the line of demarcation between the counties of Worcester and Gloucester. Mr. George Moneypenny was appointed as engineer. After considerable progress had been made with the work it was discovered that the foundations were not sufficiently substantial, and the trustees were prevailed upon to dispense with the services of the engineer. They afterwards sought the services of Mr. Telford, who quickly came to the conclusion that the site for the proposed bridge had been judiciously selected, and after having ascertained by boring that the river bottom and its approaches was of soft alluvial matter, decided that it would be best to span the river with a single cast-iron arch of 170 feet, and so leave the entire waterway free of all impediment. This scheme was approved of by the trustees, and under Mr. Telford's supervision the work was immediately proceeded with. In 1825, however, it was found that erroneous estimates had been made through defective knowledge of the bed of the river, and the subscriptions obtained were inadequate. It was therefore determined in 1825 to go to Parliament for additional powers, but owing to the non-observance of Standing Orders this was delayed. In this emergency Mr. Thomas Taylor, of the Mythe, agreed to advance the whole of the money which was required to complete the bridge and roads on condition that the subscribers would consent to his having a priority of payment both of principal and interest, and that the trustees would apply to Parliament in the ensuing session for an Act to confirm the guarantee thus to be given to him by the subscribers. This was done, and on April 8, 1826, Telford signed a certificate that the contractor, Mr. M'Intosh, had carried out his undertaking, and that the work was complete. The total cost of the bridge with its approaches and roads was upwards of 35,000*l.*, though the original estimate was only 20,700*l.*, which was the amount allowed to be raised by subscription under the powers of the first Act of Parliament. More than 5,500*l.* was expended in procuring Acts of Parliament and in legal proceedings; 1,650*l.* was paid for the Upper Lode Ferry, and 1,031*l.* 17*s.* for the purchase of land; Mr. M'Intosh's contract for masonry, embankments, fencing and extra work amounted to 15,297*l.* 13*s.*; Mr. Hazeldine's for iron, &c., to 4,539*l.* 10*s.*; and Mr. Marson's for the roads, &c., to 5,872*l.* 12*s.* 11*d.*; Mr. Moneypenny's account, as engineer, was 750*l.*; and Mr. Telford's 250*l.*

TRAINING OF ARCHITECTS.

(*Concluded from page* 385.)

REMEMBER that your calling, as I said before, is to design for craftsmen, and this you will not do successfully unless you have a practical knowledge of craftsmanship yourself, which is not to be gained from books or in the office, without resort to the building-sheds, the scaffolding and the workshop. What can be more absurd than to sit all your days indoors designing things which you never see made? You are safe only on the condition of copying accurately what has been done before, because, knowing nothing practically of the working of materials, you may, if you quit the strict path of precedent, be using your material improperly, wastefully, and at the same time ineffectively. Take, for instance, the very common error into which architects have fallen in their use of marble. You have been used to stone, and when an opportunity occurs of using marble, you think you have only to go to work in the same way and your work will be as much finer than masonry as marble is finer than stone. You know, indeed, that marble was not treated in this way of old; but you think, perhaps, you can improve on the flat surfaces, the shallow sinkings and the superficial mouldings of the old men, and do something bolder and better, and so you proceed to work it into the roll mouldings and deep under-cuttings to which you are accustomed in stone. The result, if you have any of the artist in you, will disappoint yourself. One has seen too often examples of marble spoiled in this way with extravagant waste of labour, and an effect, after all, inferior to that of stone. They have failed because the architect has misused his material, and this most likely because he has never practically studied the way of working it. Had he accustomed himself to watch carvers and masons working marble laboriously with drill and chisel, he would have seen why marble was always treated by the masters of old with shallow sinkings and square returns, without under-cutting, and he would have learned that the plain surface treatment he despised was needed to give due effect to the colour and texture of the material. He might even have risen to the notion that Classic architecture itself, which is largely of a marble style, derived its peculiar details from the convenience of the masons who had to work this stubborn material.

Take, again, the case of wrought-iron work. You know from old examples and from drawings that ironwork can be twisted and hammered into certain forms and welded together while hot; but you have never seen a weld made or a scroll beat or hammered into shape. As long as you keep to designs that have been done already you may escape disaster, but if you have the right stuff in you that makes an artist, you will soon grow tired of that, and want to design something original. You make your design and write your instructions with a light heart—"Weld these together"—and so on. As a matter of fact, perhaps the smith cannot weld them, for reasons unknown

to you, but he puts the work together in some other way, as like your drawing as he can, and very likely you are satisfied. But the work nevertheless is a sham; you designed it for welding, and the smith has made it look like welding, when it is really nothing of the kind. Now had you gone and seen him with your drawing, and watched him hammering the iron, you would have understood his difficulty at once, and if you were really an artist you would there and then have taken out your pencil and altered your design to suit and express the methods to which the smith was obliged to have recourse.

I might go on with examples from all the other trades—how, for instance, the work of carpenters and joiners is often doubled uselessly, and the expense also doubled uselessly, by framing being contrived so as to force the craftsman to do by chisel what with a little management you might just as well have enabled him to do by plane. This would be obvious to you at once if you were familiar with the workshop and saw how tools were used, and how labour might be economised. But time forbids me to dwell longer on this subject; you will easily extend to all branches of construction and design the lesson I have tried to point in the foregoing instances. The sum of the matter is that there is no such thing as successful design without the legitimate use of materials; in this lies the secret of good and economical construction and of expressive design. Without it you may sit all day in your office inventing fresh designs, but they will one and all be worthless. And the knowledge necessary to enable you to design sensibly, so as to make the best use of the means at your command, is not to be had from books, but from actual study of good work, both ancient and modern, and from actual contact with handicraft and handicraftsmen. I trust therefore that your educational scheme, which is now in process of elaboration, will include some mode of bringing your students into the workshop among the workmen, not of one or two only, but of all the trades in their turn which it concerns an architect to deal with in the course of his practice. I believe there would be no difficulty in this, so far as the craftsmen are concerned. Nothing would do more to help their work than to have a body of architects to deal with in the future who knew something practically of the trades for which they made designs and specifications, instead of men who, for want of knowledge, frequently set them unnecessary tasks and lay upon them unprofitable labour. I would even go further, and say that it would be extremely desirable that every architect should actually learn some handicraft, so as to understand its difficulties and its possibilities; and by learning these in the case of one craft, he would be better able to appreciate them in the case of the others. But, even if you stop short of this, you may at least approach yourselves to the handicrafts in the way I have suggested by shutting your books and flying off to the workshops, and so learning how to design in a way that gives the workman no unnecessary trouble, makes the most economical and reasonable use of the materials, and satisfies the canon of art which requires that design shall be based upon construction, and be the outward expression of it.

This brings us back to what I said some time ago, that the main thing an architect had to learn was to construct well with an artistic motive. Let us compare this definition with that lately put forth from an authoritative source, and see how they agree. The President of the Royal Institute of British Architects, in his opening address on November 2, defines the ideal architect as "the man who unites the qualities of an artist, a constructor and a man of business." Against this, so far as it goes, I have not a word to say. The inseparable connection—I do not say between architecture and construction, because architecture includes construction—but between design and construction, is the text on which I have been enlarging to-night. If I have said nothing yet about business qualifications, it is not because I undervalue their necessity, but because I have been talking solely of architecture; and business qualifications, though as necessary to an architect as they are to all who mix in the affairs of life, are not architecture, and, moreover, cannot to any very great extent be taught.

But the President goes on to say:—"It is given to few to excel in all [these three qualifications], though there are many who, possessing a general knowledge of each, are proficient in one or the other. And is one who is distinguished by artistic taste to regard with indifference, or a species of contempt, others who may be less artists and more scientists? Or is one whose genius is construction to look askance at others who are more purely artists?" He does not go on to put a similar question with regard to those whose genius is more for business than for art or construction, whose claims to be considered architects he apparently did not find defensible.

Now here I venture, with all respect to the President, to think he is wrong. As Mr. Norman Shaw points out in his letter to the *Times*, "He divides those who practise architecture into three classes—first, those whose proclivities are artistic; second, those whose genius is constructive; and third, those who, *par excellence*, are men of business. We also make this distinction and are fully alive to the necessity of good construction, but we think that the men forming the two last divisions are, as such, not architects at all. The scientific constructor already exists in the engineer, the business man in the surveyor and commission agent."

Now, if it is possible to take an engineer or a surveyor and by endowing him, to use the President's words, with a "general knowledge" of art, thereby to make him an architect, then good-bye to architecture as an art. I have in that case been merely wasting words to-night in trying to explain that architecture is not the result of adding more or less of art to sweeten the bitterness of construction or enliven the dryness of business, but a ruling motive, which must be present from the very beginning, and inspire and govern the construction itself. This view is totally irreconcilable with the officially-pronounced view of the Institute, that a "general knowledge of art" superadded to sound business habits or skill in construction will suffice to make a man an architect.

This definition occurs in the course of the President's defence of the system of examinations conducted by the Institute, and imposed as tests on all who seek to become members of that body. And as our subject to-night is architectural education, it is time to say something on this matter of examination, about which there is, as you know, great difference of opinion, not only between the Institute and outsiders but even within the Institute itself. Examination is the contribution of the Institute to the cause of architectural education. "We do not teach," they say, "but we examine." Their theory is that the necessity of preparing for examination will direct the student in the course of his studies and give him system in his reading. I hope to show you that so far from these examinations being a help to the education of the beginner, they are in fact only a hindrance and distraction.

In the first place, they put before him a wrong motive. He learns, not in order to know but to pass, and he will get no solid good from study pursued with such an object as that. Looking to examination as his goal, he will not—dare not—work in any direction that does not lead that way. He may have a special bias to some particular branch of architecture, and desire for a time to give himself to it exclusively, but he cannot linger; the examination awaits him, and he tears himself away and dilutes his attention to spread it over the whole field of architecture. He may know himself to be ignorant of some other branch of his subject, and wish to work it out thoroughly and master it, but he knows it will not pay with the examiners, and he is forced to content himself with that superficial knowledge which is all he can hope to master in the time and over so large an area of subjects. The system which was promised him for a guide and help proves only a clog to his progress. Let me quote the admirable remarks of Professor Aitchison on this subject:—

"System is an excellent thing, and if it only means the inclusion of what an architect must know, nothing can be said against it. But a man must take care that system does not prevent him learning anything. I have been through examinations, and when I started to prepare myself I spent several days in laying out a systematic course of study, and I endeavoured to follow it, but I found there were subjects that I could not master in the time set down for them. If I had stuck to this systematic system I should have learned nothing, and what I had to do was to learn the subjects and ignore the system."

But, we are told, the examination has the inestimable advantage of enabling the students to test "the extent and accuracy of their knowledge." I believe it does nothing of the kind. On the contrary, it enables them to play off their shallow knowledge or perhaps that of their crammer—for that worthy has, I hear, already appeared on the scene—against the wits of the examiners. In order to pass, the candidate must answer a certain number of questions on a wide range of subjects. It is a pure chance what he will be asked, and he loads his mind with a general superficial knowledge—a kind of mental dust-shot—which spreads so wide as to be sure of hitting something, though it will not penetrate very deep. This is not the kind of examination that enables the student to test his own knowledge. It is not like the examinations of pupils by the tutors under whom they have been working during the term, the object of which is to ascertain whether the lessons have been properly understood. It is not like the examinations at the universities of Oxford and Cambridge, where, again, the subjects are clearly defined and have been all taught during the collegiate course by the same men who examine. The Institute examinations are totally different, for though it examines it does not teach, and has no students.

But the most fatal deception practised upon the innocence of the student is the pretence that it is an examination in architecture at all as an art. It is an examination of what can be learned from books and drawings, but contains no test that the student has ever carried his knowledge afield and tried it in the actualities of life. Accepting for the moment the President of the Institute's threefold division of architecture into art, construction and business habits, it is evident that only one of the

three can really be brought to the test. You may examine a man in construction no doubt—that is to say, in construction apart from art, but how are you to examine him in his business qualifications? I acquit the President of including among these the extraneous pursuits which many men follow besides architecture, such as belong to the land surveyor and estate agent, the lawyer and the speculator in building schemes—a class of pursuits so foreign to architecture that no man who follows the two can hope to succeed in both. I assume him to mean such a faculty for keeping expenditure within bounds, and insuring that his employer gets his money's worth, and of controlling the builder and workman with tact and good temper, as is necessary if things are to go smoothly and well. But who is to examine the student in that? In the first place, it is a matter of habit which can only be acquired by actual experience, which the young architect can only learn as he goes on, for assuredly no one can teach it him, and in the second place it is largely a matter of natural tact and temperament, which may be improved but cannot be supplied if it is absent.

Still less is it possible to bring his artistic qualifications to the test of examination, if there is any truth in the picture I have to-night attempted to draw of what they should be. You may ask him questions in the history of the art: he may satisfy you as to dates and names, periods and examples, but, as I have already said, he may have all that at his fingers' ends, and yet be incapable of architecture. He may be a good antiquary, and yet remain totally devoid of imagination and sense of beauty, without which he can never be an artist. You will never invent any test which you can safely apply to qualifications of this kind; if you try to exercise it you will infallibly fail to keep out those who are unworthy, and probably also shut your door in the face of some heaven-descended genius whose originality you may fail to appreciate.

Observe, I entreat you, that this is not a question of examining for a prize, when you compare one design with others and give the reward to the best. That is easy enough and fair enough, and in its prize funds and scholarships the Institute has a grand opportunity for stimulating and distinguishing art students. But we are now considering a totally different kind of examination—a qualifying one—one for excluding or admitting a student primarily to the ranks of the Institute, and, secondarily, to those of the profession. For though the Institute at present disclaims any ambition to make architecture a close profession under their presidency, still it comes to the same thing, for they aspire to sweep us all into their net, and their dream of the final state of architecture is that every architect shall perforce have passed into the Institute through the gates of examination.

The illustrations by which the President tried to defend examination are altogether irrelevant. "Is not life," he seems to say, "one long examination? Do not artists submit to examination when they send their pictures to the Academy? Does not everyone who is employed practically submit to examination by his employer?" and so on. Now all this is really trailing a red-herring across the path. One might as well ask whether it was not by examination that butcher Jones secured my custom instead of butcher Smith. The examination we protest against is a qualifying one, one which you must pass in order to get your bread in a certain calling; and it is obvious that this is not the case with the President's illustrations. Painters who are rejected at the Academy are not debarred from selling their works to anyone who will buy them, and there is nothing in my dealing with Jones which prevents Smith from selling his mutton to other people.

I do not say that in theory it is absolutely impossible to construct a system of examination so rigid that every incompetent pretender to architecture shall be excluded. But who is to be trusted to keep the door? How many in a generation would be found worthy to pass it? For instance, if it were tried to-morrow, would all the present members of the Institute be found on the inside of the door, or would a good many be left gnashing their teeth on the outside? Such a system of selection is impossible, and yet anything short of it is a mere imposture and a sham. The majority of candidates are and must be mediocrities, and you will have to admit them with their middling gifts, and to suit your standard to their capacities. If you argue that they will at least be no worse for being examined, I reply that they will certainly be no better, and that at all events it would have been something not to have set your seal on them by way of recommending mediocrity to the public.

However, examination is now the banner under which the Institute sails, and the next step is to be the extension of this test to the different grades of that society. The President asks why the Fellows are not to enjoy the same blessings as the Associates, and suggests that they, too, should be required to pass an examination for the higher degree. And so we go on till, if I may be forgiven for trifling with so serious a subject, one may imagine the presidential chair thrown open to competition in order that its occupant may not be excluded from advantages of examination enjoyed by the inferior members.

I have dwelt at some length on this matter of examinations because at the beginning of your new educational system it is all-important that your students should make up their minds what they are trying for, and because, if your schools become mere places for training or cramming architectural students for passing examinations, you are, in my humble opinion, going the safe way to reduce them to uselessness, and to alienate the interest of all who look upon the study of art with different eyes. The note of alarm has already been sounded; when the Institute was considering the question of a grant of money to your schools, one speaker proposed that the grant should be given at the rate of so much a head for every one of your students who passed the Institute examinations. How this was settled I know not, but I do know that the idea that this would be the main motive of your teaching has prevented several architects from aiding you whose advice and experience would have been of infinite service.

Believe me, that if you propose to your students such an end as this, you will be putting before them an unworthy motive, and your schools are predestined to barrenness. On the other hand, tell your students that they come here simply to learn to be architects, without any secondary aim; teach them architecture in all its aspects, constructive and utilitarian, but always in conjunction with good design; make them learn a few things at a time thoroughly rather than many things lightly; insist on their having a reason for what they do, and hold them back from a fresh step till they have mastered the first; bring them as soon as possible into touch with the craftsmen, and make them craftsmen themselves if you can; let them learn from things rather than from books, enlarging their knowledge by experience of technical methods, which is the readiest way of sowing in their minds the seeds of fresh elements of design; above all, teach them to keep bright by constant use such strains of originality as their nature possesses, and you will make your schools true nurseries of architects, though I think it very likely your students would be plucked in the Institute examination.

When I reflect that it is with you, gentlemen, the younger members of our craft, and with those students whom you are now undertaking to train, that the hope of English architecture lies, it seems impossible to overrate the seriousness of the crisis. Your new schools may do much to help our art onwards, or they may aid in stifling it under the dull weight of professionalism. I put before you good and evil, artistic life and artistic slumber; it is for you to make your choice.

THE WORKSHOPS ACT IN LIVERPOOL.

THE Town Clerk of Liverpool has drawn up a report with reference to the Factory and Workshop Act, 1891, which comes into operation on January 1, 1892. He points out that "the principal change effected by the statute is the placing of the sanitary regulation of workshops under the direct control of the sanitary authority instead of under that of the inspector of factories. On receiving notice of the occupation of a workshop the inspector of factories is required to forward the notice forthwith to the sanitary authority. Should the sanitary authority neglect to carry out the provisions of the Act, the factory inspector may, after notice to the authority, take the requisite proceedings and recover the expenses from the sanitary authority. The Secretary of State is also empowered to direct, in case of default, the factory inspector to take action at the expense of the sanitary authority. It will be the duty of the sanitary authority to take action in cases where any workshop or workplace is not kept in a cleanly state or not ventilated in such a manner as to render harmless, as far as practicable, any gases, dust or other impurities generated in the course of the work carried on therein that are a nuisance or injurious to health, or is so overcrowded while work is carried on as to be dangerous or injurious to health, and with regard to other matters of a like character. The sanitary authority and their officers are invested with the same powers with regard to entry, inspection, taking proceedings, &c., as an inspector of factories. The Act applies for the first time the sanitary provisions as to workshops to laundries. A commentator upon the Act says, "The inclusion of laundries is new, and establishes a new principle, for hitherto the factory Acts have been confined to places where things are produced, not where work alone is done." Section 2, subsection 3, enacts that "if any child, young person or woman is employed in a workshop, and the medical officer of the sanitary authority becomes aware thereof, he shall forthwith give written notice thereof to the factory inspector of the district." By section 96 of the Act of 1878 the term "child" is defined as meaning a person under fourteen years, a "young person" as meaning a person of the age of fourteen years and under the age of eighteen years, and a "woman" as a woman of eighteen years or upwards. Section 4, subsections 1 and 2, enact as follows:—1. "Every workshop as defined by the principal Act (including any work-

shop conducted on the system of not employing any child, young person or woman therein) and every workplace within the meaning of the Public Health Act, 1875, shall be kept free from effluvia arising from any drain, water-closet, earth-closet, privy, urinal or other nuisance, and unless so kept shall be deemed to be a nuisance liable to be dealt with summarily under the law relating to public health. 2. Where, on the certificate of a medical officer of health or inspector of nuisances, it appears to any sanitary authority that the limewashing, cleansing or purifying of any such workshop, or of any part thereof, is necessary for the health of the persons employed therein, the sanitary authority shall give notice in writing to the owner or occupier of the workshop to limewash, cleanse or purify the same or part thereof, as the case may require." The important subject of the means of escape in case of fire is also dealt with by the new Act. Section 7 requires with respect to every factory of which the construction is commenced after January 1 next, and in which more than forty persons are employed, that a certificate shall be obtained from the sanitary authority stating that the factory is provided, on the storeys above the ground-floor, with such means of escape in case of fire for the persons employed therein as can reasonably be required under the circumstances of the case. The section makes it the duty of the sanitary authority to examine every such factory, and on being satisfied that the factory is so provided they must give the required certificate.

As regards all factories which are already in existence, or which may be begun to be erected before January 1 next, and in which more than forty persons are employed, the section imposes upon the sanitary authority the duty as soon as may be after the passing of the Act, and afterwards from time to time, of ascertaining whether all such factories within their district are provided with the means of escape in the case of fire already referred to, and, if not, of serving on the owner within the meaning of the Public Health Act 1875 (see section 4 of that Act), a notice in writing specifying the measures necessary for providing such means, and requiring him to carry them out before a specified date. The owner will thereupon, notwithstanding any agreement with the occupier, have power to take the steps necessary for complying with these requirements, and unless they are duly complied with, the owner will be liable to a fine not exceeding 1*l.* for every day that the non-compliance continues. In the event of a difference of opinion arising between the owner and the sanitary authority, it may be referred to arbitration, and provisions with regard to the appointment of arbitrators are contained in the first schedule of the Act. The costs of the arbitration and award are to be paid by such of the parties as the award may direct. The Act of 1891 contains a novel provision intended, no doubt, to have some bearing upon what is known as the "sweating system." The provision is contained in the 27th section, which enacts that the occupier of every factory and workshop (including any workshop conducted on the system of not employing any child, young person or woman therein), and every contractor employed by any such occupier in the business of factory or workshop must, if required to do so by order of the Secretary of State, keep in a form and with particulars prescribed by the Secretary of State, lists showing the names of all persons directly employed by him, either as workman or contractor, in the business of the factory or workshop outside the factory or workshop, and the places where they are employed, and the list is to be open to inspection by any officer of the sanitary authority. If this section is contravened, the occupier or contractor will be liable to a fine not exceeding 40*s.* The definition given in the Acts of a factory and a workshop respectively is too lengthy and complicated to be conveniently included in this report. It may, however, be stated in very general terms, and subject to many extensions and limitations of meaning, that a factory is a place wherein, or within the close or curtilage of which, steam, water, or other mechanical power is used to move or work any machinery employed in preparing, manufacturing and finishing certain classes of articles referred to in the 93rd section of the Factory and Workshop Act, 1878; and that a workshop is any premises, room or place where manual labour is exercised by way of trade or for purposes of gain in or incidental to the making of any article, or of part of any article, or in or incidental to the altering, repairing, ornamenting or finishing of any article, or in or incidental to the adapting for sale of any article, and to which or over which premises, room or place the employer of the persons working therein has the right of access or control. The duties of the sanitary authority under the Acts are, with the exception of the requirements as to means of escape in cases of fire, almost exclusively confined to workshops.

The Newbury Town Council having considered the report of Mr. Baldwin Latham on the three schemes submitted for the drainage scheme, have decided to appoint Mr. Baldwin Latham their engineer, and to instruct him to formulate a scheme for the drainage of the district.

PROPOSED MARKET IMPROVEMENT IN LEEDS.

An improvement in the Kirkgate Market, calculated to have a beneficial effect, has been projected by the Markets Committee of the Leeds Corporation. It is proposed, says the *Leeds Mercury*, to add a piece of ground comprising 1,054 square yards at the northern end of the Fish Market, and to cover it with a glass roof. The site of this extension, which has George Street on one side and East Lane on another, was, until a few months ago, occupied by fourteen small shops and dwellings, the clearing away of which has materially improved the sanitary state of the neighbourhood. The increase of the facilities for the sale and purchase of fish by this addition will be another distinct advantage, the accommodation of the existing Fish Market having for some time past been obviously insufficient. The most interesting part of the scheme, however, is that which provides for the covering of the ground. To find the kind of glass roof best adapted to the purpose, the committee have been at some pains. Inquiry and inspection have led them to adopt the plan carried out with a very satisfactory effect at the new Midland station, Bradford. This consists of a series of ridges and furrows, and lends itself admirably to the equal distribution of light and to good ventilation. It affords a further advantage, which weighed with the committee. It can be readily extended in any direction. The chairman of the Markets Committee (Alderman Hardwick) has, we believe, frequently urged the desirability of covering the whole of the open space in the market, and, as many of his colleagues admit, there is much to be said in favour of such an improvement. It need scarcely be said that in weather such as we have had of late, neither seller nor buyer finds the open square a very agreeable place, and it is computed that the revenue of the Corporation is 250*l.* a year less than it would be if there were protection from the rain. On a wet market day fewer of the vendors of the hundred and one different articles usually offered for sale take stands, and the receipts of those who brave the exposure are considerably less than under more favourable circumstances, inasmuch as there are fewer buyers. It is not suggested that a glass roof should be erected over the part occupied by the blocks of buildings where fruit and vegetables are chiefly sold, but that the avenues separating these should be covered. This would contribute in no small degree to the comfort of the public doing business in the market, but would to a corresponding degree enhance the value of the stores, and in some measure tend to increase the income from rents. There would then be no need for the verandahs to the stores, which at present prevent the convenient use of the upper rooms for storage purposes. The committee are about to ask the Council to grant 4,000*l.* for the increase of the accommodation for the sale of fish, this to include the cost of the glass roof on the ridge and furrow principle. That improvement will demonstrate what the advantages of covering the open ground would be. This, we understand, would entail an expenditure of about 16,000*l.*, and the covering of the avenues would cost about half that amount. Alderman Hardwick, who has carefully studied the matter, is strongly of opinion that the increase of revenue which such an improvement would bring would more than compensate for the outlay, whilst the utility of the market from the public point of view would be vastly greater.

GENERAL.

The Royal Scottish Academy opened the annual exhibition on Saturday, instead of as usual about the middle of the month of February. A leading feature of the exhibition is a fine display of works by the late Sir William Fettes Douglas. The works include 523 oil-paintings, 39 works in sculpture, and 269 water-colour and architectural drawings.

A Street in the Colombes, in the environs of Paris, is, by order of the Municipal Council, to be named after the late Théodule Ribot, the painter, who died there a few months ago.

"**The Choir of a Cathedral**" is the subject assigned this year by the Académie des Beaux-Arts for the Prix Achille Leclerc, which will be adjudged on February 27, 1892.

Mr. H. Hayter, C.E., has been invited to report to the Bray Commissioners on certain deviations from the specifications in carrying out the harbour works.

Mr. J. S. Simonds has been selected by the London County Council to fill the place of Sir E. M. Shaw as head of the London Fire Brigade.

The General Committee for the Aston Technical School have decided to select three architects to send in competitive sketch plans for their proposed technical school, instead of commissioning an architect for the job.

Canon Argles, of York, in connection with the St. Clement's Improvement Society, has given an address on the "Development of Gothic Architecture as seen in the Old Cathedrals and Abbeys of the Country."

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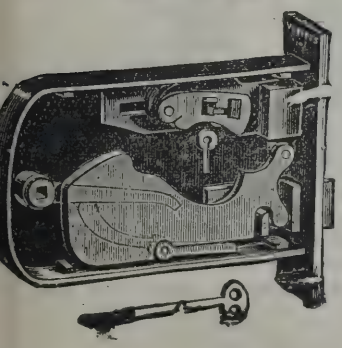
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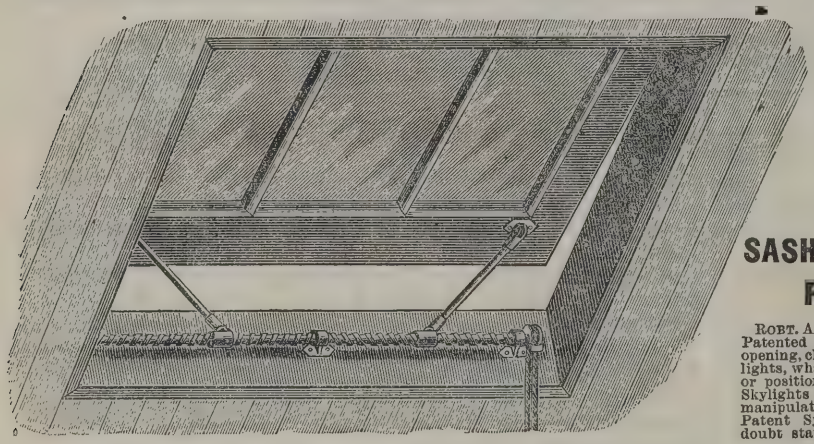
SOUTHAMPTON.—July 18.—For Building Classroom, Lecture Theatre and Chemical Laboratory. Mr. W. B. G. Bennett, C.E., Municipal Buildings, High Street, Southampton.

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SWINDON.—July 11.—For Construction of Settling Tanks, Mixing-house, Carriers, &c., at Sewerage Farm. Mr. H. J. Hamp, Surveyor, 10 Queen Anne's Buildings, Faringdon Street, New Swindon.

SWINDON NEW TOWN.—July 7.—For Construction of Settling Tanks. Mr. H. J. Hamp, Surveyor, 10 Queen Anne's Buildings, Faringdon Street, New Swindon.

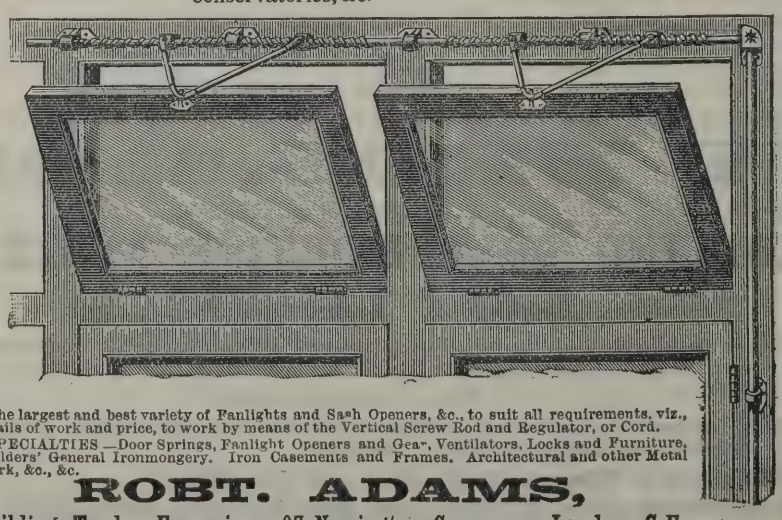


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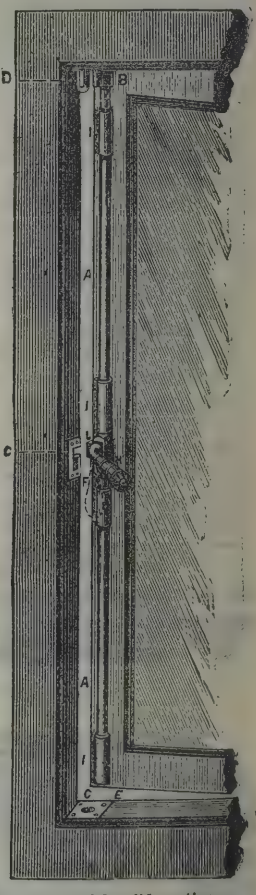
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THANET.—July 15.—For Erection of Boiler-house, Setting Boilers and Work in Connection. Messrs. Adams & Son, Engineers, 41 Marshall Street, Golden Square, London, W.

TOTTENHAM.—July 7.—For Sewering, Levelling, Paving and Making-up Roads. Mr. J. E. Worth, Engineer, Local Board Offices, Coombes Croft House, High Road, Tottenham.

WALCOT.—July 4.—For Construction of Abutments, Retaining Walls, Raised Approach, &c., in connection with Iron and Steel Bridge, and Strengthening Foundation of Stone Bridge. Mr. A. T. Davies, County Surveyor, Shire Hall, Shrewsbury.

WALSALL.—July 10.—For Heating Chapel and School-rooms. Mr. Joseph Gittings, 156 Wednesbury Road, Walsall.

WEST COWES.—July 4.—For Supply of Oil Lamps for Street Lighting. Mr. Nelson F. Dennis, C.E., Town Surveyor, West Cowes.

WESTMINSTER.—July 9.—For Wood Paving. Mr. Harry Wilkins, Vestry Hall, Piccadilly, W.

WESTMINSTER.—July 20.—For Building Public Library, Baths and Wash-houses. Mr. Francis J. Smith, 17B St. George Street, S.W.

WORCESTER.—July 8.—For Taking Down and Rebuilding School. Messrs. Henry Rowe & Son, Architects, Worcester Chambers, Pierpoint Street, Worcester.

YSTRADYFODWG.—July 11.—For Building Board Schools at Cwmclydach and at Tylorstown. Mr. J. Rees, Architect, Pentre.

TENDERS.

ABBEY WOOD.

For Erecting Residence at Abbey Wood, Kent, for Mr. J. Hickie. Mr. H. H. CHURCH, Architect. Quantities by Mr. H. Strudwick.

Balaam Bros.	£3,720 0 0
Holloway Bros.	3,564 0 0
J. Morter	3,530 0 0
H. L. Holloway	3,480 0 0
Chapman	3,450 0 0
B. E. Nightingale	3,292 0 0
Strickland & Coulter	3,100 0 0

ABERDEEN.

For Enlargement of Dr. Brown's School, Skene Square, for the Aberdeen School Board.

A. Scroggie, mason	£2,267 0 0
Bain & Son, carpenter	1,947 0 0
Mason & Son, painter	598 0 0
Rodger & Baxter, plasterer	473 0 0
J. F. Anderson, plumber	448 0 0
M'Gregor & Shand, slater	193 0 0
Abernethy & Co., ironwork	285 10 0
Total.	£6,211 0 0

ABERGWYNFI.

For Building Hotel, Abergwynfi, near Bridgend. Mr. G. F. LAMBERT, Architect, Bridgend. Quantities by Architect.

D. C. Jones & Co., Gloucester	£2,320 0 0

Seven tenders received.

ALLERTON.

For Alterations to Old Mill, Allerton. Mr. THOMAS BARKER, Architect, 5 Bond Street, Bradford.

Accepted Tenders.

T. Hindle, Bradford, mason	£840 0 0
J. Foster, Allerton, joiner	532 8 0
E. & W. H. Haley, Bradford, ironfounder	420 0 0
Cockcroft & Jarratt, Allerton, plumber	134 0 0
T. Bolton, Bradford, plasterer	110 0 0
Hill & Nelson, Bradford, slater	76 0 0
W. Priestley, Allerton, painter	28 0 0

BECKENHAM.

For Tar-paving (4,000 square yards), Alexandra Recreation Ground, Beckenham, for the Local Board. Mr. C. B. CARLTON, C.E., Surveyor.

J. Smart, Finsbury Park	£568 10 0
Woodham & Fry, Greenwich	451 3 0
F. Hudson, Dulwich	439 0 6
Benstead & Son, Maidstone	403 0 0
D. Marchin, Bromley	385 4 8
HOBMAN & CO., Bermondsey (*accepted*)	379 15 5
J. G. B. Marshall (*too late*)	—
Engineer's estimate	396 2 0

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BLAGDON.

For Building Cottage, Stable and other Farm Buildings at Barton Pines, Blagdon, Paignton. Mr. W. M. TOLLIT, Architect, Totnes. Quantities by Architect.

J. Zealey, Newton Abbot	£1,010 0 0
F. Vanstone, Paignton	942 0 0
Webber & Maunder, Paignton	835 0 0
Rabbich & Brown, Paignton	818 0 0

BRIDGEND.

For Building Dwelling-house, Shop and Premises, Bridgend, for Mrs. Ann Morgan. Mr. GEORGE F. LAMBERT, Architect, Bridgend.

William McGaul, Bridgend £980 0 0

Seven tenders received.

BRYMBO.

For Building Church and Schoolroom at Brymbo. Mr. M. J. GUMMOW, A.R.I.B.A., Architect, Regent Street, Wrexham. Quantities supplied.

	Church.	School.
Charles Burt, Liverpool	£1,290 0 0	£380 0 0
Hughes & Owen, Wrexham	1,218 18 2	283 15 1
W. E. Samuels, Wrexham	1,190 0 0	250 0 0
Davies Bros., Wrexham	1,150 0 0	255 0 0
LEWIS ROBERTS, Brymbo (*accepted*)	1,000 0 0	186 15 0

CARDIFF.

For Alterations to the Royal George Hotel, Roath, for Mr. Loveless. Mr. CHARLES RIGG, Architect, 24 High Street, Cardiff.

G. BEAMES, Violet Row, Cardiff (*accepted*) . £2,487 10 0

CASTLEBLAYNEY.

For Building Lecture Hall for First Castleblayney Presbyterian Church.

T. WHITE, Castleblayney (*accepted*) . . . £400 0 0

GAINSBOROUGH.

For Erection of a Malting, for Messrs. Sandars & Co., Gainsborough. Messrs. INSKIPP & MACKENZIE, Architects, 5 Bedford Row, W.C. Quantities by Messrs. R. L. Curtis & Sons.

H. S. & W. Close, Lincoln	£7,258 0 0
W. Wright & Sons, Lincoln	7,061 0 0
S. & W. PATTINSON, Sleaford (*accepted*)	6,850 0 0

HENDON.

For Supply of Gas Engines, Pumps, &c., for the Low Level Sewerage, for the Hendon Local Board.

Easton & Anderson, Whitehall	£1,570 0 0
Hughes & Mann, Highgate	1,450 0 0
Goddard, Massey & Warner, Nottingham	1,448 15 0
H. Prince, Westminster *	1,425 10 0
R. Warner & Co., Cripplegate	1,420 0 0
The British Gas Engine Company	1,353 0 0
Needham & Sons, Glasgow	1,349 0 0
Bilbie, Hobson & Co., London	1,295 0 0
Bilbie, Hobson & Co., for Winter's Rotary Pumps instead of Pumps specified	1,030 0 0
N. J. Pratten, Reading	1,275 0 0
The Constructional Ironworks Co., Dace Road, Old Ford	1,245 0 0
CROSSLEY BROS., Manchester (*accepted*)	1,200 0 0
H. Rogers, Watford Engineering Works (Day's Gas Engine)	1,130 0 0
H. Rogers (Crossley's Gas Engine)	1,276 0 0
H. Rogers (Atkinson Gas Engine)	1,196 0 0
Wallis & Co., Southwark †	1,097 0 0

* Error of £225 (too much). † £50 left out of tender.

ILKLEY.

For Building Two Shops and Dwelling-houses, Ilkley, for Mr. W. Scott. Mr. A. MARSHALL, Architect, Otley.

Accepted Tenders.

J. Brown, Ilkley, mason	£568 15 8
E. Stephenson & Son, Ilkley, joiner	344 10 0
R. Bradley, Ilkley, plumber	109 15 0
R. Richardson, Ilkley, plasterer	88 17 0
R. Nelson, Ilkley, slater	35 0 0
J. G. Boden, Ilkley, painter	20 0 0

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Brunton & Son, Inverkeithing	£1,411 3 5
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Stuart's Granolithic Paving Co., Limited	1,076 16 0
J. Young & Sons, Edinburgh	1,027 9 7
J. Dobbie, Leith	1,000 0 0
A. Simpson, Leith	990 3 10
F. COOPER & SON, Musselburgh (*accepted*)	925 12 3

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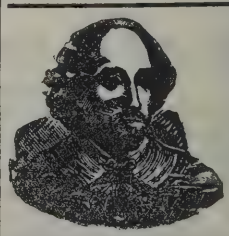
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For the Beaumanor and Woodhouse Water Supply and Fire Protection. Mr. GEORGE HODSON, Engineer.

J. Bentley, Leicester	£3,105	18	6
J. Peattie, South Kensington	2,878	5	0
J. Biggs, Birmingham	2,810	0	0
Jenkins & Son, Leamington	2,756	0	0
H. Vickers, Nottingham	2,750	0	0
Price & Shardlow, Nottingham	2,711	0	0
Fotherby & Son, Burnley	2,699	8	5
J. PERKINS, Loughborough (*accepted*)	2,487	15	0

LONDON.

For Erection of Stable and Cart Shed at New Cross Gate, S.E., for Mr. S. J. Clegg. Mr. FRED. G. GRIERSON, Architect, 9 Old Jewry Chambers, Cheapside.

J. Watt	£253	12	0
C. Watts	190	0	0
Evans & Co.	175	0	0
W. Tunbridge	165	0	0
I. & A. Oldman	162	0	0
Courtney & Fairbairn	159	0	0

For Painting and Repairs at the Fever Hospital, Haverstock Hill, for the Metropolitan Asylums Board.

Graham & Graham, Portland Place	£440	0	0
J. Foulkes, Tooley Street	250	0	0
Rowe Bros., Camden Town	196	0	0
W. & E. Mills, Westcombe Park	195	0	0
F. Grover, Hampstead	179	15	0
R. Seed, Chiswick	169	10	0
G. A. & H. Wall, Kentish Town	145	0	0

For Re-erection of Farley Cottage, Church Lane, Hampstead, for Mrs. Emma Sell. Mr. ALBERT E. PRIDMORE, M.S.A., F.S.I., Architect, 2 Broad Street Buildings.

W. A. HUDSON (*accepted*) £655 0 0

No competition.

For Erection of Dye Houses at Rudford Road Leather Works, Rotherhithe, for Mr. F. G. Armfield. Mr. FRED. G. GRIERSON, Architect, 9 Old Jewry Chambers, Cheapside.

COURTNEY & FAIRBAIRN (*accepted*).

No competition.

LONDON—*continued.*

For Erecting Proposed Premises in Rosebery Avenue, for Mr. T. W. Debenham. Messrs. T. CHATFEILD CLARKE & SON, Architects. Quantities by Messrs. Leonard & Clarke.

Cox	£2,698	0	0
Holland & Hannen	2,610	0	0
Ashby & Horner	2,594	0	0
Colls	2,582	0	0
Woodward	2,570	0	0
Lawrence	2,511	0	0
Toms	2,418	0	0
Shurmur	2,394	0	0
Scrivener	2,392	0	0
Hall, Bedall & Co.	2,390	0	0
Ashby Bros.	2,387	0	0
B. E. Nightingale	2,316	0	0

For Alterations, &c., to No. 32 St. Mary Axe, for the City of London Real Property Co., Limited. Mr. R. B. MARSH, Architect. Quantities by Messrs. Campbell & Co.

J. Greenwood	£1,725	0	0
Ashby & Horner	1,707	0	0
Lawrence & Son	1,650	0	0
Kilbey & Gayford	1,464	0	0
B. E. Nightingale	1,438	0	0
Holloway Bros.	1,429	0	0

For Alterations to Residence at Honor Oak. Mr. HENRY LOVEGROVE, Surveyor.

W. Vogel Goad	£525	0	0
Leeks & Hooker	412	0	0
COURTNEY & FAIRBAIRN (*accepted*)	395	0	0

For Partly Rebuilding No. 43 Monkwell Street. Mr. CHARLES FOWLER, Architect. Quantities by Mr. Henry Lovegrove.

Bulman & Dales	£1,054	0	0
Larter & Son	935	0	0
Woodward & Co.	910	0	0
LIDSTONE & SON (*accepted*)	898	0	0

For Erection of Carriage Builders' Shop and Showroom, High Street, Lewisham, for Mr. Back. Mr. FRED. G. GRIERSON, Architect, 9 Old Jewry Chambers, Cheapside.

J. WATT, Catford (*accepted*).

No competition.

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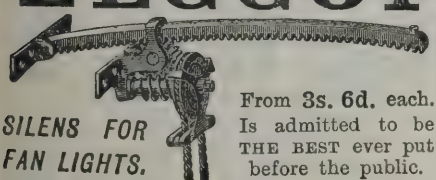
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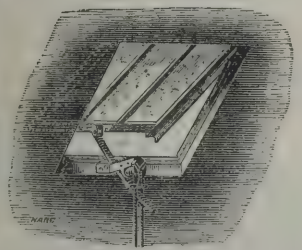
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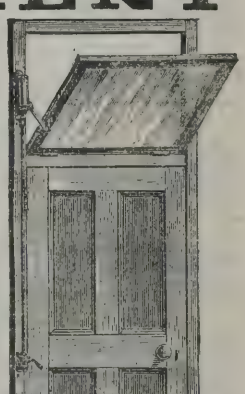
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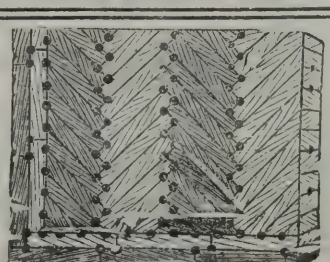
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For Villa Residence at Neath, situate near the Gnoll. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A., Architects, Swansea.

D. C. JONES & Co., Gloucester (*accepted*)	£1,162 7 9

NEWBURY.

For Stable Buildings and Lodge, The Ham, London Road, for the Hon. R. Tollemache. Mr. JAMES H. MONEY, Architect, Newbury.

Stables.

E. JAMES & SON, Newbury (*accepted*)	£408 0 0

Lodge.

E. JAMES & SON, Newbury (*accepted*)	£250 0 0

NEWTON ABBOT.

For Erection of a Semi-detached Pair of Houses adjoining Torquay Road, Newton Abbot. Messrs. J. W. ROWELL & SON, Architects, Newton Abbot.

W. Mills, Newton Abbot	£898 0 0
F. A. Stacey, Newton Abbot	790 0 0
S. Zealley, Newton Abbot	780 0 0
F. Barrow, Newton Abbot	594 0 0

NUNHEAD.

For Proposed Coal Cellar, &c. (to Hold 40 Tons), at the Metropolitan Beer and Wine Merchants' Asylum, Nunhead Green, Surrey. Mr. W. F. POTTER, Architect.

F. Dawes, Peckham Rye	£135 0 0
W. Wythe, Dalston	129 5 0
H. J. Rogerson, Nunhead	116 10 6
J. GREEN, Hatcham (*accepted*)	93 0 0

PORTSMOUTH.

For Building Piggeries and Killing-house at Workhouse, for the Guardians of Portsea Island Union. Mr. RICHARD J. JENKINS, Architect, 56 Commercial Road, Landport. Quantities supplied.

Spriggins Bros., Stamshaw	£2,050 0 0
T. P. Hall, Southsea	2,000 0 0
W. Learmouth, Portsmouth	1,994 10 5
C. Dye, Portsmouth	1,930 0 0
T. Bowler, Stamshaw	1,915 0 0
A. E. Porter, Portsmouth	1,880 0 0
H. F. Boulton, Portsmouth	1,810 0 0
Jerome & Bone, Portsmouth	1,804 0 0
SCAMMELL & DOWDELL, Portsmouth (*accepted*)	1,735 0 0

STOCKPORT.

For Forming and Laying-out the Edgeley Recreation Ground. Mr. J. ATKINSON, Borough Surveyor, Stockport.

Brick Walling, &c.

D. EADIE, Heaton Norris (*accepted*)	£387 12 0
T. Derbyshire	369 6 0
A. Taylor	351 6 4
T. & H. Hayseldine	342 0 2
D. Mullaney	333 17 2
T. & W. Meadows	331 4 4
A. Howard	329 6 0
J. Broadhurst	277 0 0

Excavating, &c.

J. Broadhurst	758 10 0
E. Thomas, Liverpool	489 0 0
D. Mullaney	465 0 5
T. & H. Hayseldine	462 8 9
A. Taylor	443 7 1
J. Leach	419 0 10
A. Howard	410 17 6
R. Holland	317 6 5
T. & W. Meadows	307 0 10
J. Gott, Preston	286 9 10
P. D. & S. D. Hayes	271 12 1
D. EADIE, Heaton Norris (*accepted*)	232 17 1

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A. J. Main & Co., Glasgow	506 1 10	474 18 0
Doodson & Smith, Cheetham	497 12 0	456 2 8
E. C. & J. Keay, West Bromwich	490 11 10	461 12 6
Hill & Smith, Dudley	468 16 11	406 12 11
Walker Bros., Walsall	456 4 3	401 1 5
Brookes & Co., Manchester	453 11 2	405 3 5
Economic Fencing Co., London	446 7 7	404 17 9
W. Barnes, Ashbourne	433 14 10	408 4 3
W. Tomlinson & Son, Patricroft	428 5 8	379 18 2
Johnson, Sons & Co., Walsall	427 9 5	390 3 0
H. Hollingdrake & Son, Stockport	414 12 11	380 1 11
Hydes & Wigfall, Sheffield	414 12 11	380 1 11
R. T. Smith & Co., Whitchurch	406 15 7	354 18 11
Morton & Co., Liverpool	402 15 7	358 6 9
T. & W. Meadows, Stockport	371 13 0	348 8 2
D. EADIE, Stockport (*accepted*)	357 5 9	336 11 1

"SPHINX" PORTLAND CEMENT



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1 inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works. Specially adapted for Concrete Floors and Street Paving.

"ECLIPSE" PORTLAND CEMENT

Quick setting; test 3 parts Standard Testing Sand. 230 lbs. per square inch; 28 days. The finest, most plastic, best sand carrying, and cheapest Cement in the market. Specially adapted for laying encaustic tiles, making joints in sanitary pipes, internal stucco, concrete foundations, &c.

Samples sufficient for Practical Tests Free. Manufactured by

JOHN BOARD & CO., Dunball, Bridgwater.

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NATURAL PORTLAND AND ROMAN CEMENTS, HYDRAULIC BLUE LIAS LIME, Plaster of Paris, Keene's and Parian Cements. Bricks, Roofing Tiles, Drain Pipes, Paving Tiles, Bath Bricks, &c. Railway and water communication.

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Rainwater Goods, Sash Weights,

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"Model Dwelling," Newcastle Exhibition, 1887.



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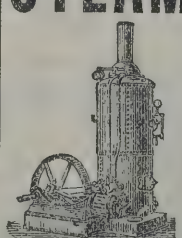
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IS THE BEST MATERIAL FOR ROADWAYS, FOOTWAYS,

Damp Courses, Roofings, Warehouse Floors, Basements, Stables, Coach-Houses, Slaughter-Houses, Breweries, Lavatories, Tennis-Courts, &c.

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PORTHCAWL.

For Extension to The Rest, Porthcawl. Mr. G. F. LAMBERT, Architect, Bridgend. Quantities by Architect.

W. McGane, Bridgend	£6,062 0 0
J. Rees, Rhondda Valley	5,786 0 0
Stephens & Bastow, Bristol	5,599 0 0
D. Morgan, Cardiff	5,456 0 0
D. C. Jones & Co., Gloucester	4,984 0 0
W. Lissmain, Chipping Campden	4,890 0 0
J. D. WILLIAMS, Knighton Road (*accepted*)	4,475 0 0

For Masonic Hall, Bridgend.

W. FRANCIS, Bridgend (*accepted*)	1,050 0 0

SOUTHAMPTON.

For Constructing Boundary Wall round Open Swimming-bath and Premises, Western Shore Baths, Southampton.

Morgan, Isted & Morgan	£294 0 0
Roe & Co.	290 0 0
CROOK & SON (*accepted*)	279 0 0
Surveyor's estimate	285 0 0

SOWERBY BRIDGE.

For Works at New Wesleyan Chapel and School, Friendly, near Sowerby Bridge. Mr. T. L. PATCHETT, Architect, Halifax.

Accepted Tenders.

J. Stafford, Sowerby Bridge, heating apparatus	£77 10 0
James Cronkshaw & Sons, Haslingden, gates and railings	54 13 0
E. Whitehead & Co., Sowerby Bridge, painting	41 8 0

SUTTON COLDFIELD.

For Laying-out, &c., the Hartopp Road, Four Oaks Park Building Estate, Sutton Coldfield, for the Marquis Clanricarde. Mr. C. F. MARSTON, Surveyor, Mill Street, Sutton Coldfield.

J. Bradley, Lincoln	£3,198 0 0
J. Tomlinson, Derby	3,163 0 0
W. Heaps, jun., Birmingham	2,876 0 0
Currall, Lewis & Martin, Birmingham	2,789 0 0
G. Trentham, Birmingham	2,665 0 0
G. Law, Kidderminster	2,537 0 0
Jones & Fitzmaurice, Birmingham	2,530 0 0
Walkden & Co., West Bromwich	2,350 0 0
J. Biggs, Birmingham	2,250 0 0
J. EVANS, Ealing (*accepted*)	2,170 0 0

SWANSEA.

For Building Higher Grade School, Swansea. Quantities by Mr. T. P. MARTIN, Architect, Swansea.

		Alternative.
Bennett Bros., Swansea	£8,654 0 0	£6,335 10 0
T. Richards, Swansea	8,200 0 0	8,370 0 0
J. Williams, Knighton	7,830 0 0	7,279 0 0
D. C. Jones & Co., Gloucester	7,701 0 0	6,891 0 0
H. Billings, Swansea	7,225 10 0	6,775 10 9
JENKINS BROS., Swansea	6,829 0 0	6,783 3 0*

Accepted.

Heating.

Haden & Son, Trowbridge	509 0 0
J. Jeffreys, Westminster	323 0 0
Perkins & Son, London	305 15 0
Karting Bros., London	250 0 0
J. King, Liverpool	235 0 0
Wood & Co., Bristol	225 17 0
Musgrave & Co., Belfast	222 15 0
F. Spencer, Oldham	220 0 0
Wansborough & Son, Barrow-in-Furness	219 0 0
W. Jackson, Birmingham	204 3 4
Jenkins & Son, Leamington Spa	200 0 0
Truswell & Son, Sheffield	181 0 0
JONES & SON, London (*accepted*)	165 0 0

For St. Mark's Vicarage, near Swansea, for Rev. J. Meredith Williams. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A., Architects, Swansea.

J. D. Williams, Knighton	£1,330 0 0
G. Palmer, Neath	1,300 0 0
Thomas Watkins & Jenkins, Swansea	1,267 10 0
Bennett Bros., Swansea	1,200 0 0
Charles Walters, Swansea	1,131 0 0
T. Richards, Swansea	1,122 14 6
Weaver Bros., Swansea	1,089 0 0
H. Billings, Swansea	1,045 0 0
GUSTAVUS BROS., Swansea (*accepted*)	1,015 0 0

For Cottage, Sketty, near Swansea. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A., Architects, Swansea.

H. Billings, Swansea	£270 0 0
J. GWYN, Swansea (*accepted*)	267 0 0

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FOR HARDENING AND PRESERVING STONE.

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Parquet Floor, Joinery and Wood Carving Co., Ld.

PARQUET FLOORINGS

One inch and ¼-inch thick.

Immense Stock always ready for Laying.

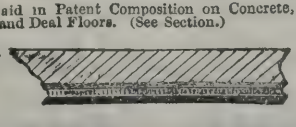


Turpin's Patent,

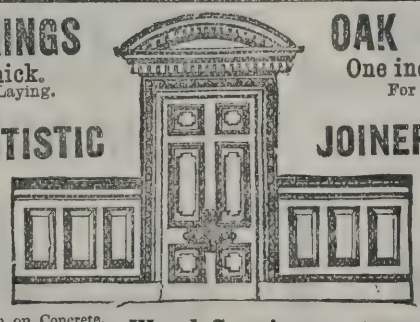
6-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

¾-inch Parquet

Wood Backing



ARTISTIC JOINERY.



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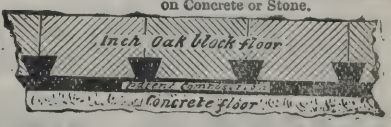
OAK BLOCK FLOORINGS

One inch thick, 4s. 10½d. per yard, super.

For Material only, exclusive of Laying.



Turpin's System of Preparing, for Laying inch Block Floor on Concrete or Stone.



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For Arcade Business Premises, Goat Street, Swansea. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A., Architects, Swansea.

Bennett Bros., Swansea	£5,950	0	0
H. Billings, Swansea	5,565	0	0
F. Stevens, East Grinstead	5,359	0	0
Jenkins Bros., Swansea	5,200	0	0
J. D. Williams, Knighton	5,099	0	0
D. C. Jones & Co., Gloucester	4,949	0	0
GUSTAVUS BROS., Swansea (*accepted*)	4,915	0	0

For Additions and Alterations to Killing-house, near Swansea. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A., Architects, Swansea.

H. Billings, Swansea	£880	0	0
J. Gwyn, Swansea	851	0	0
Jenkins Bros., Swansea	850	0	0
Gustavus Bros., Swansea	768	0	0
G. PALMER, Neath (*acccepted*)	750	0	0

SWINDON.

For Enlargement of the Upper Stratton Infants' School, for the Stratton St. Margaret School Board. Messrs. WILLIAM DREW, M.S.A., & SON, Architects, 22 Victoria Street, Swindon.

T. Barrett, Swindon	£780	10	0
G. Wiltshire, Swindon	775	0	0
H. LOOKER, Stratton (*accepted*)	750	0	0

TORQUAY.

For Erection of a School Building at Chelstow, Torquay, for Mr. Richard Mallock, M.P. Messrs. J. W. ROWELL & SON, Architects, Newton Abbot.

Vanstone & Mumford, Torquay	£1,380	0	0
C. Cocks, Torquay	1,353	0	0
F. Matthews, Babbacombe	1,340	0	0
J. W. McKellar, Torquay	1,339	0	0
M. Pack, Cockington	1,300	0	0
G. K. SMALE, St. Mary Church (*accepted*)	1,250	0	0

TWYFORD.

For Iron Bridge, Twyford.

Geo. Double, Ipswich	£877	2	0
ALFRED THORNE, London (*accepted*)	875	0	0
Jewell & Son, Winchester	851	14	0

WEYMOUTH.

For Building the Weymouth Steam Flour Mills, for Messrs. Swatridge & Co. Mr. SAMUEL JACKSON, M.S.A., Architect. Quantities by Architect.

J. Purchase, Weymouth	£3,300	0	0
J. Bull & Son, Southampton	3,147	0	0
Morgan, Isted & Morgan, Southampton	3,096	0	0
Stephens, Bastow & Co., Bristol	3,091	0	0
Whettam, Weymouth	3,083	0	0
J. A. Bartlett, Weymouth	3,075	0	0
J. W. Trappitt, London	3,036	4	3
H. J. Sanders, Southampton	3,000	0	0
A. A. Clarke, Weymouth	2,978	0	0
T. H. Kingerlee, Oxford	2,934	0	0
BROWN BROS., Weymouth (*accepted*)	2,869	0	0

TRADE NOTES.

WE have pleasure in announcing that Messrs. C. Kite & Co., ventilating engineers, of Christopher Works, Chalton Street, London, have been entrusted with the ventilation of the new Council Chambers for the Orange Free State Government at Bloemfontein, South Africa, of which Mr. Lennox Canning (Messrs. Canning & Gould) is the architect.

THE new Board Schools, Carlisle, are being warmed and ventilated throughout by means of Shorland's patent warm-air ventilating Manchester grates and stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

WE are informed that Mr. Charles A. Smith, of the Athenæum, 71 Temple Row, Birmingham, has been appointed agent for Messrs. Woodhouse & Rawson United, Limited, for Birmingham and district, and has opened show-rooms at that address, where samples of goods may be seen as well as local orders executed from stock.

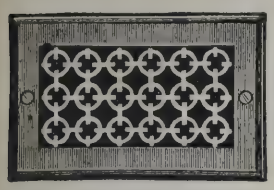
A NEW price list has been issued by Messrs. Webb & Son, of Comb Tannery, near Stowmarket. Messrs. Webb & Son, who have been awarded numerous medals at exhibitions, lately exhibited at the Royal Agricultural Society's Show at Doncaster, a collection of their leather machine bands, leather hose, fire buckets, lashing laces, strap butts, valve hides, English butts, calf skins, sheep leather, woolly leather, lambskins, &c. &c.

MESSRS. RICHARD SCHREIBER & Co., of 44 Gray's Inn Road, Holborn, W.C., are introducing their xylonite and paper-

W. B. SIMPSON & SONS
PAINTERS & DECORATORS
W. B. SIMPSON & SONS *furnish Estimates for the execution of Painting, Wall Papering, and Decoration of every description, in good taste and with best workmanship. They invite attention to the large assortment of Wall Papers, Fabrics, Stained Glass, and Decorative Accessories, of the most recent production and newest design, also to the collection of Sketches on view at their Showrooms.*
100 ST MARTINS LANE LONDON W.C.

THE
"CLIMAX"
PATENT DIRECT-ACTING TURRET
VENTILATORS
Are the Best in Design, most Powerful, and Cheapest in the Market.
CLIMAX VENTILATING CO., 15 GREAT GEORGE STREET, WESTMINSTER, S.W.

GIBBS' PATENT
Noiseless Outlet Ventilator.



(Rd. Design.)

BRASS TRELLIS FRONTS.

GIBBS' PATENT WEATHERPROOF EXTRACTORS,

From **12**/- each.

In CONSTANT and EXTENSIVE USE BY THE ADMIRALTY, HER MAJESTY'S OFFICE OF WORKS, THE LEADING STEAMSHIP COMPANIES AND ARCHITECTS THROUGHOUT THE KINGDOM.

THEIR QUALITIES AND CAPABILITIES HAVE STOOD THE PRACTICAL TEST of TIME.

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CHEAPEST,
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IN THE MARKET.

GIBBS' IMPROVED VERTICAL INLET.



No. 7 (Inlet).
ORNAMENTAL BRACKET PATTERN.



No. 3 (Registered Design).
GIBBS' PATENT WEATHERPROOF EXTRACTOR.

No. 16. (Registered Design.)



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COMPARE MAKE
AND
PRICE.



GIBBS' IMPROVED VERTICAL INLET.

No. 4 (Circular Front).
STRONG GALVANISED BOARD SCHOOL PATTERN.

GOTHIC.
SOIL PIPE PATTERN.



(Registered Design.)
PRICE ON APPLICATION.

PRICE LIST—EX-WORKS, LIVERPOOL. (Subject to Alteration without Notice.)

ROOF VENTILATORS, Patterns Nos. 1 to 3. Strong Galvanised Steel, RIVETTED THROUGHOUT, and Painted with Enamelled Paint.

Extractor, 12 in. dia.	.....	4½ to 6 in. pipe	..	£1	11	6	Extractor, 20 in. dia.	.....	8 to 10 in. pipe	..	£3	17	0	Extractor, 36 in. dia.	.....	14 to 18 in. pipe	..	£9	15	0
„ 14 „	.....	5 to 7 „	..	1	17	6	„ 24 „	.....	9 to 12 „	..	5	5	0	„ 42 „	.....	16 to 20 „	..	11	17	6
„ 16 „	.....	6 to 8 „	..	2	12	6	„ 27 „	.....	12 to 14 „	..	6	7	6	„ 48 „	.....	18 to 24 „	..	16	15	0
„ 18 „	.....	7 to 9 „	..	3	5	0	„ 30 „	.....	13 to 15 „	..	7	10	0	„ 54 „	.....	20 to 27 „	..	19	0	0

New Illustrated Catalogue and all further Particulars may be had from the Sole Patentees and Manufacturers,

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WARMING, VENTILATING AND CONSULTING ENGINEERS,

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stucco, which they claim is a capital substitute for the ordinary plasterwork, and is often preferred on account of its lightness, elegant appearance, correct execution and artistic design. These decorations can be affixed with common screws or thin wire-nails by any builder, carpenter or painter. The stucco decoration will not fall off. The first prize at Melbourne was awarded for this new decoration.

THE tender of Messrs. Martinson & Welton, builders, Bellingham, North Tyne, has been accepted for the addition of chancel to Falstone Church, North Tyne, under Messrs. Plummer & Burrell, architects, Newcastle-on-Tyne.

THE tender of Mr. John West, South Weston Road, Strood, Rochester, has been accepted for the re-erection of premises, 99 Eastgate, Rochester, for Messrs. Willis Bros., Mr. Walter Banks, of Rochester, being the architect.

THE tender of Messrs. J. Henshaw & Sons, of Liverpool, has been accepted for the extension of the Arnot Street School, at Walton-on-the-Hill, which is to be carried out under the direction of Mr. Edmund Kirby, of Liverpool, architect.

A MEETING of the members of the Potteries and Newcastle branch of the Amalgamated Society of Carpenters and Joiners has been held at Hanley. A knife-and-fork tea was provided at the Albion Hotel, and a meeting was afterwards held in the Temperance Hall. A resolution was passed, "That, in the interests of the society generally, it was desirable that members should exert themselves in getting fresh members to join the ranks."

THE following tenders have been accepted for grain and hay stores for Messrs. Clark Brothers, Palmerston Road, Aberdeen:—Masonwork, Greig & Craib; carpenterwork, Webster Brothers; slaterwork, George Davidson, jun.; plumberwork, A. G. Elmslie; painter and glazierwork, William Slater & Sons; ironwork, M'Kinnon & Co.

COMPLAINT has been made by the Education Department to the London School Board that the Charing Cross Road school, in the centre of a large population, is in a "disgraceful condition" in respect to sanitary matters. The school was a transferred one, and the Board is not primarily responsible for the drainage. Complaint is also made of the school buildings in Goodman's Yard, Minories, in the City division, also a transferred voluntary school, in place of which the Board is to build a new school. The Wandsworth District Board of Works having drawn attention to the state of the drains at the St. Andrew's Street Board School, Wandsworth Road, the assistant architect has surveyed them and reported the drainage to be in a "deplorable condition" from being ill laid.

THE complete public and private electric lighting of the town of Carlow has just been effected by means of water power situated at Milford, five miles distant. The electricity is brought into the town by overhead wires carried on poles placed along the towpath of the Barrow River, and it is distributed through $4\frac{3}{4}$ miles of the streets of Carlow.

THE *Aberdeen Press* says the plans of the new public library show an iron railing in front of the building. In view of the fact that the new Free South Church is fronted by a handsome white granite balustrade, and that at no very distant date the whole of the east side of Union Terrace will be similarly treated, it has been considered that the appearance of both buildings would be improved if a similar balustrade were erected in front of the library instead of the iron railing as designed.

THE contracts of Messrs. R. Aitkenhead & Son, masons; Mr. James Black, joiner; and Messrs. J. M'Lean & Co., plumbers and gasfitters, have been accepted for the reconstruction of the interior of the Gaelic parish church, Greenock.

AT the meeting of the Walsall Town Council the Mayor, in proposing the acceptance of tenders for the supply of 34,000 tons of gas coal, said that when the tenders first came in the committee thought that some of the prices were excessive. They declined to accept them, and, as the result of negotiations, first one and then another firm reduced their quotations, and the tenders before the meeting were 662*l.* 10*s.* less than the original ones, the figures being 23,212*l.* 10*s.*, as compared with 23,875*l.*

A SPECIAL meeting of the Cardiff Chamber of Commerce has been held for the purpose of considering the question of dock accommodation. Mr. John Gunn presided. It was unanimously felt that increased dock accommodation should be provided without delay, and a deputation to the Cardiff County Council was appointed.

AT the meeting of the Edinburgh and Leith Gas Commissioners it was stated that during the year they had made at their own works 1,373 million cubic feet of gas, as compared with 1,273 million cubic feet last year.

THE Maidstone Local Board of Health at their meeting accepted tenders for supply of stone for the roads. Among those accepted was that of Mr. James Runnalls, of Penzance, for 2,195 tons of Penlee elvan granite at 9*s.* 6*d.* Alderman Long said the Highways Committee recommended the purchase

Head Office & Works:—
POWNALL ROAD,
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Telephone No. 1140.

ELECTRIC LIGHTING.
PATERSON & COOPER,
3 PRINCES MANSIONS, VICTORIA STREET, WESTMINSTER.

Glasgow Branch:—
137 WEST REGENT STREET.
Telegraphic Address:—
"Patella, London."

PATERSON & COOPER beg to give notice that they have Opened West End Offices and Showrooms at the above address
ESTIMATES FOR ELECTRIC LIGHTING OR OTHER ELECTRIC WORK FREE OF CHARGE.

BRITANNIA TIN AND COPPER WORKS.
TO ARCHITECTS AND BUILDERS.

Fountain Street, Bury, and Shiffnall Street, Bolton:
February 13, 1891.

Gentlemen,—We have pleasure in announcing that we have opened extensive Show Rooms at 117 QUEEN VICTORIA STREET, LONDON (opposite Civil Service Stores).

We have been very successful in Lighting and Ventilating Public Buildings in all parts of the Country.

We have a large stock of Sunlights, Turrets, Exhaust Roof Outlets, Tobin's Tubes, Air Grids, &c., &c. at our Show Rooms.

We feel confident that our DESIGNS, as well as our system of Lighting and Ventilating will commend themselves to all who are interested in having BRILLIANTLY LIGHTED and WELL-VENTILATED ROOMS.

A visit to our Show Rooms will be esteemed a favour. If inconvenient to call, send for one of our Illustrated Catalogues, inspect our Designs, and read our Testimonials.

Trusting to receive your favours, which shall have our prompt attention,
We remain, Gentlemen, yours obediently, J. H. PICKUP & CO.

NO FAMILIES WHO VALUE THEIR HEALTH SHOULD BE WITHOUT ONE OF THE
LONDON AND GENERAL WATER PURIFYING COMPANY'S, LIMITED,

House Cistern, fitted with a Cistern Filter.


PATENT CISTERN FILTERS, Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. *Vide* Professor Frankland's Reports to the Registrar-General, July 1866; November 1867; and May 1870. The *Lancet*, January 12, 1867.
Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.
Price, £1 10s. and upwards Portable Filters on this System, £1 5s. to £3.
Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Bagshot Park, by H.R.H. the Duke of Cambridge, the *élite* of the Medical Profession, and at the London, Middlesex, St. George's, St. Mary's, Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4*s.* 6*d.* and 6*s.* each. Household and Fancy Filters, from 10*s.* Water-Testing Apparatus for detecting Impurities in Water, 10*s.* 6*d.* and 21*s.* each.
157 STRAND, W.C. (Four Doors from Somerset House), LONDON.

Portable Cistern Filters


Reading Cases for the Architect.—Price Two Shillings. Office: 175 Strand, London, W.C.

of Penlee granite, which was the same as they had had for a great many years in the town. The only object of the committee was to get the best stone they possibly could for the money; and when they remembered that the crushing strength of Penlee granite was 29,000 lbs. per square inch, and that of Guernsey granite 15,000 lbs., they would not be in doubt as to which was the best stone.

VARIETIES.

DURING a thunderstorm on the 25th ult. the roof of Doveridge Church, near Uttoxeter, was set on fire, but, fortunately, extinguished before serious damage was done. It seems the lightning struck the vane and detached the upper portion, and then ran down the conductor and along the bottom of the roof, bursting the gaspipe and igniting the gas.

THE Town Hall at Leek was also struck by lightning, the conductor safely carrying the electricity to the ground. Where the conductor entered the ground a waterpipe was fused, and the water burst up through the pavement. The whole of the building was shaken by the force of the blow.

AT Liverpool the spire of St. Saviour's Church Schools was struck by lightning. There were about seven hundred children and a number of teachers in the building, and the shock was so great that the school trembled to its foundations. St. Paul's Church, situated in the business portion of Liverpool, was struck by lightning and the dome set on fire. Fortunately the firemen prevented much damage to the edifice.

NEGOTIATIONS are in progress between the Middlesex and Surrey County Councils with a view to rebuilding Kew Bridge. The present bridge is only 24 feet wide and exceedingly steep. The idea is to build a new structure of stone, with five instead of seven arches, in the style of the present bridge, 44 feet wide. The roadway to be 28 feet and the footpaths 8 feet in width.

A MEETING of the chairmen and clerks of all the School Boards of North Staffordshire has been held at Stoke, when it was proposed to resuscitate the scheme for the establishment of a joint truant school for the district. It was resolved to form a joint committee consisting of two members and the clerk of each Board to decide upon the best plan of carrying the scheme into effect.

AT Edinburgh a committee of the Town Council lately visited the Fettes estate, where a piece of ground extending to an acre and three-quarters has been offered to the city by Dr. Rowand Anderson, architect, on behalf of the Roughhead Trustees, on condition that a couple of foot-bridges are erected across the Water of Leith near this point. The cost of the bridges is set down at 600*l.* or 750*l.*, and it is said that the acquisition of the ground by the city would be a desirable step.

A BILL promoted by the Manchester Town Council has come before a Committee of the House of Commons. The Bill gives power to the Council to establish a "thrift" scheme, to deal with advertisements on walls and "sky-signs," to sell water for hydraulic power, and provisions as to streets and buildings, drains, music and dancing licenses, and other matters which affected the improvement of the general health, &c., of the city.

AT Stratford-on-Avon a conference has taken place between members of the Town Council and the rural sanitary authority on the question of providing a joint sanatorium for the two authorities.

AT the meeting of the Tamworth Rural Sanitary Authority it was decided to apply to the Local Government Board for authority to expend a sum of money, not exceeding 250*l.*, in sinking and boring near Kingsbury Wood in the permian, in order to discover, if possible, a water supply for the Kingsbury parish.

IT is proposed to utilise the water of the river Isar for lighting Munich by electricity. The details of the project have been worked out by Herr Oskar von Miller, electrical engineer, and technical manager of the Frankfort Exhibition.

A BILL has been introduced by Mr. Balfour for the reimbursement to training colleges in Ireland of certain past expenditure on their sites, buildings, appurtenances, premises and fixtures.

THE members of the Glasgow Town Council have made the annual inspection of the Loch Katrine waterworks. When the new undertakings in course of formation are completed, the supply of water to the city will be increased by 70 million gallons per day, which, along with the present delivery—42 million gallons—will bring the total available supply up to 112 million gallons per day. Craigmaddie reservoir, which is being constructed, is much larger than that of Mugdock. It will have a water surface of 86¼ acres, and will contain 700 million gallons, being a supply at 40 million gallons per day for 18 days, in addition to the 12¼ days' supply the present Mugdock reservoir contains. The inlet and outlet works will



be so arranged that either or both reservoirs may be used for the supply of the city. A water-tight bottom has now been reached, and the trench is being refilled with puddle over a length of 2,800 feet. Including the Barrochan property, the extent of the land purchased for this reservoir is 215½ acres.

IN connection with the proposed sewerage of Writtle, Dr. Thresh, the medical officer of health to the Chelmsford Rural Sanitary Authority, has reported that, with Mr. Smith, he lately visited the Acton Sewage Works, and examined the Polarite filter beds in use, with a view to ascertain whether the process could be rendered applicable for the treatment of the sewage of Writtle. Everything they saw and heard bore out all they had been led to expect from the process. The filter beds were very small, yet they filtered rapidly, and had for years retained apparently unchanged their purifying powers. The effluent produced seemed to be quite satisfactory. As a result of the visit they were decidedly of opinion that the Writtle sewage could be satisfactorily treated by precipitation in tanks and final filtration through a few square yards of sand and Polarite filter.

BUILDING AND BUILDERS.

THE foundation-stone of a public hall for Corstorphine has been laid. The plans, which have been prepared by Mr. J. Robert Pearson, architect, Edinburgh, provide for a hall with dome-shaped recess or platform, capable of accommodating 460 people. Behind the hall are two retiring-rooms, and above these a caretaker's house. In front of the main building is a double storey, in a plain Scottish style. On the ground-floor, to the right of the chief entrance, is a committee-room, and to the left a cloakroom, the space overhead being occupied as a lecture-room, which may be used as a library and reading-room. The dressings are of red stone and the walls of natural faced blue Hailes stone.

PLANS for the extension of the Longmore Hospital for Incurables have been passed by the Edinburgh Dean of Guild Court. The proposed work consists mainly of an extension eastwards, 40 feet parallel to Salisbury Place, and running back as a wing northwards to the length of about 120 feet, but considerable alterations will be made in the centre block of the present building and the wing behind it. The accommodation in the present building, including that in the adjoining houses which are to be taken down, provides about sixty beds; whereas when the new buildings are completed, the accommodation will be for about a hundred beds, in addition to the servants' rooms and those of the nurses and probationers, who are to be in the upper floor of the present centre block after it has been re-arranged. The cost is expected to be between 7,000*l.* and 8,000*l.* The architects are Messrs. Kinnear & Peddie.

ON Monday afternoon a meeting of master builders was held at Bedford Street, Holborn, "to protest against the manner in which the School Board for London deals with their work, bills and payments." Mr. Dove was in the chair, and other firms represented included Atherton & Latta, Dearing & Son, Charteris, Cubitt, Seeley, Lathey, &c. The meeting, it was explained, had been called because of the builders being so badly treated that some of them had refused to do further work for the Board under present arrangements. They not only, it was said, had their bills shamefully cut down, but had to threaten legal proceedings before they could get their money. One builder stated, as an instance, that the Board at one time owed him nearly 500*l.*, and, in response to an application for a settlement, a cheque was sent for 3*l.* 17*s.* 5*d.* The system adopted by the School Board for their repairing accounts and schedule prices was declared to be one that was worrying to the builder, and also one that must necessitate an increased staff of clerks at the central offices of the Board to check the Bills. The builders had to insert every item of repairs, such as "one screw, ½*d.*," "three yards of cord, 2*d.*," and so on, leading to extra cost in the builders' offices as well. The system had become so intolerable and the periods of payment so extended, that the builders had tacitly agreed not to work under present arrangements. Mr. Cook, a member of the School Board, sent a promise to the meeting to introduce a deputation to the School Board, and this offer was accepted.

THE *Aberdeen Press*, referring to the proposal which has been mooted in Town Council circles of erecting new municipal buildings for the city, says the matter the other day came up at a meeting of the magistrates. The question arose in connection with another subject which was before the bailies, and went as far as a discussion on the best site for the new structure.

THE infants' school at Upper Stratton, near Swindon, is about to be enlarged by the Stratton St. Margaret School Board at a cost of 750*l.* Mr. H. Looker, of Stratton, will carry out the works, from the designs and under the superintendence of Messrs. William Drew, M.S.A., & Son, of Swindon.



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THE church of Ormskirk has been restored at a cost of 17,000*l.* It is one of the most interesting churches in the country, dating from 1080. It has a Derby chapel, which for 300 years has been the burial-place of the Earls of Derby. The church has a massive tower and spire, standing side by side, and in that respect is unique in England.

AMERICAN NOTES.

THE New York *Builder and Woodworker* says :—The radical plan adopted in London of providing decent homes for the decent poor seems to have attained so much of success that no working man will be compelled to live in such filthy, malodorous dens as thousands of Englishmen and Americans have been doomed to occupy. The condition of New York is fully as bad as London, and is steadily growing worse. The success of the plan adopted in London points the way to the relief of New York.

THE Chicago *Journal of Commerce* reports Judge Gresham's description of the court-house as follows :—I think it is positively dangerous to remain in this part of the building. The ceilings have bulged so as to break the water-pipes, and as a result the air is contaminated, foul gases generated and I believe it is affecting my health. It would be dangerous for a well man to occupy these rooms. Just look at those cracks. There is a fissure an inch wide at the side of the fireplace that has opened within the last three months and another at the doorway of my room nearly an inch wide, and that has appeared within the last few weeks. The workmen come around here occasionally and putty up the cracks, but that's all the good it does. I'm getting entirely out of patience over the situation.

THE Owana, Mich., *Times* says :—The three-storey factory building of the D. M. Estey Furniture Company, size 256 feet by 80 feet, was erected in five and three-quarter days, and the machinery put in and at work six days later. The building required in its construction sixty car-loads of lumber and 170,000 feet of flooring, and the machinery is run by a 250 horse-power engine.

THE output of sandstone in the United States in 1889, according to a bulletin issued by the Department of the Interior, Washington, was 71,571,054 cubic feet, valued at 10,816,057 dols., while for 1880 the value was only 4,780,391 dols., an increase during the decade of 6,035,666 dols., or 126·26 per cent. There were 16,925 workmen employed, to whom were paid in wages 6,257,580 dols. The total expense of producing sandstone in 1889 was 8,130,295 dols., and the total capital invested 17,776,467 dols., of which 11,501,100 dols. was invested in land. A table showing the relative standing of productive States is given according to the tenth and eleventh censuses. It is evident from this that, while eighteen States only were productive in 1880, the number has now reached forty. Ohio holds first place in both. At the tenth census New York held second place, but bluestone is included in the figures given for value of output. At the present time New York holds fifth place, and the apparent decline is due to the exclusion of bluestone. According to the eleventh census Colorado holds third place, while ten years ago it held sixteenth place among the productive States. The vast increase in the sandstone production of this State, namely, from 9,000 dols. to 1,224,098 dols., is due largely to the operations of the Union Pacific Railway Company. Enormous shipments of sandstone are now made from Colorado to remote parts of the United States, and the business is in a most flourishing condition. Another notable change is the appearance of California as a productive State, holding eleventh place. This State does not appear among the eighteen States of the tenth census. It is evident that the increase in production during the last ten years amounted to 6,035,666 dols., or 126·26 per cent. The eighteen States which were productive in both census years produced sandstone in 1889 to the value of 10,068,475 dols., or 93·09 per cent. of the entire product, not, however, including bluestone. The twenty-two new States produced to the value of 747,582 dols. in 1889, or 6·91 per cent. of the total amount. It is thus apparent that although the number of States producing sandstone is now more than twice as great as in 1880, nearly the entire output comes from the same States that were productive ten years ago. It is evident that in both censuses the North Atlantic division was the most productive, the North Central division following closely in value of production. The Western division stands third for the eleventh census, with a product amounting to 1,781,539 dols., while the third position for the tenth census is occupied by the South Atlantic division. Fourth place for the eleventh census is filled by the South Central division, in which at the tenth census no sandstone was produced. Fifth place for the eleventh census is occupied by the South Atlantic division, which produced only a small amount ten years ago. The great bulk of the sandstone production comes, therefore, at

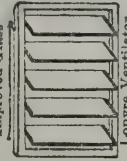
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HEALTH EXHIBITION.



MEDAL AWARDED, 1884.

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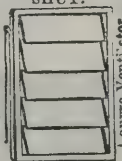


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H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.

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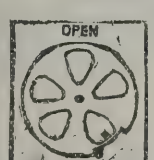
GLASS SELLERS' COMPANY EXHIBITION,

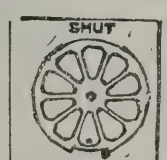


MEDAL AWARDED, 1876.

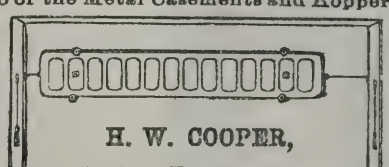


Improved Casement.

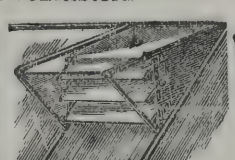




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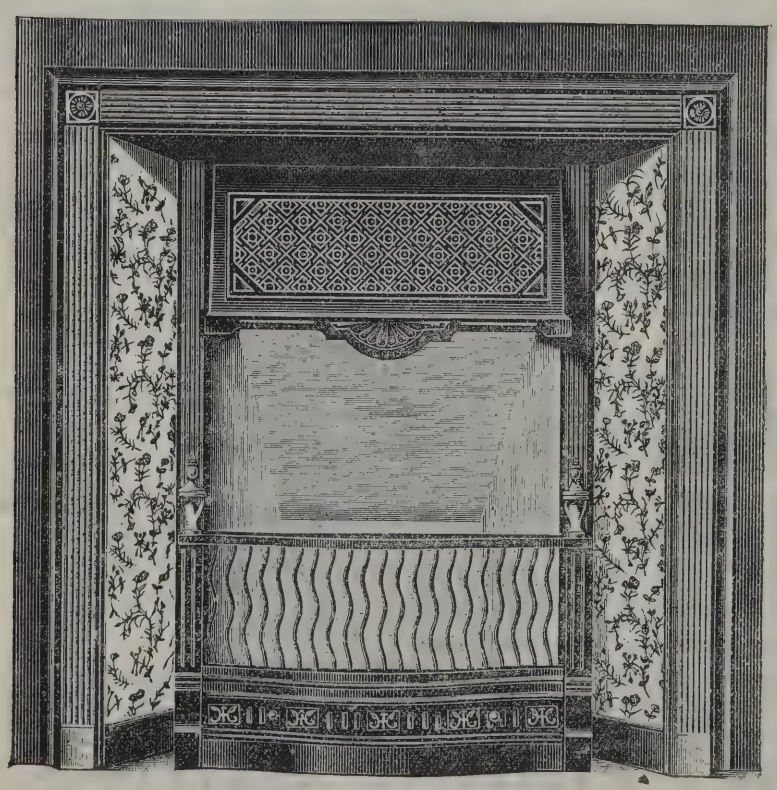
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present from the North Atlantic and North Central divisions, the South Atlantic and the South Central producing very little in comparison, while the Western division shows the enormous increase in ten years from 11,000 dols. to 1,781,539 dols. From the grand total for the United States, it appears that 71,571,054 cubic feet of sandstone, having a total value of 10,816,057 dols., were produced by 16,925 workmen from 803 quarries. To this number of men 6,257,580 dols. were paid in wages. The total expense of producing the entire amount of sandstone is 8,130,295 dols., thus indicating a profit to the producers of 2,685,762 dols. The total capital invested is 17,726,467 dols., of which 11,401,100 dols. is vested in land. It appears that 7,121,942 dols. worth of stone is applied to building purposes, while 1,831,822 dols. worth has been applied to street work. Abrasive purposes have consumed an amount valued at 582,229 dols., while for bridge, dam and railroad work 1,021,920 dols. worth was used. For miscellaneous purposes the amount is 259,144 dols. Although the value of the stone for abrasive purposes is comparatively small, it is important to note that the quality of the stone applied to these purposes is necessarily very fine, and consequently has a decidedly higher average value per cubic foot than that used for any other purpose.

SANITATION.

SANITARY engineering is in the ascendant. There is a general desire to secure the very best methods of domestic sanitation, as evidenced by the crowd of architects, sanitary specialists, &c., who accepted the invitation of Messrs. John Bolding & Sons to inspect their new premises, Grosvenor Works, Davies Street, Oxford Street. The prominent position of this firm is well known ; a flattering testimony is that, after occupying an old-fashioned place in South Molton Street for seventy years, they have found it necessary to build these immense new works to contend with the increased demand. Tuesday, June 30, the day of its opening, must, therefore, be marked a red-letter day not only for Messrs. John Bolding & Sons, but for their clients, to whom better facilities for selecting their goods are here given in this roomy, convenient depôt. Mr. Bolding was present to show his visitors all over the fine building, and the architects responsible for it, Messrs. Wimperis & Arber, explained the details of the structure to an audience strongly prejudiced in its favour. It will be no digression to say that Messrs. Bolding & Sons recommence business in, perhaps, as fine works, warehouse and show-rooms as has ever been provided for the purpose, occupying six floors, and arranged to accommodate show-rooms on the first three floors and workrooms on the remainder. This brings every department under one roof, except the brass, which is at 304 Euston Road. All the work is done on the premises, and under the immediate supervision of those responsible for its finish and excellence. Thus the sixth floor is occupied by the marble masons, who prepare the highly-finished lavatories, baths, &c., and the fifth and fourth floors by the engineering department, brass fitting, &c. The firm have certainly shown that they practise what they preach by transforming the ordinary gloom of a workshop into a bright, sunny, airy, comfortable room, that would satisfy an artist. The top floors communicate with showroom basements by means of a large lift. An iron staircase fire-escape is accessible from every floor, and the whole building is fireproof. The buyer who could not find his requirement in these showrooms would, indeed, be incorrigible. First of all, the things are arranged in such an attractive manner, thanks to the manager, Mr. Hart. All the different patterns of closets, for instance, some hundreds, are placed side by side, and as the water is connected, a practical illustration of the merits of each is given. The "Simplex" and the "Kenon" are the two best known, and are in universal use. We particularly noticed the advantage of the porcelain lining, which insures perfect cleanliness. The same system of arrangement with the baths, different sorts and sizes grouped together, at prices to suit "all sorts and conditions of men," and it is surprising to see how cheap some of these luxuries are—a porcelain lined bath, for instance, with shower fittings attached, for 8*l.* 15*s.* The most noticeable feature in all these goods is the perfect finish, such that one seldom sees in such work. The cabinetwork and the selection of marbles to match leaves no room for criticism. The different kinds of urinals are placed together—automatic, treadle and otherwise ; whilst the patent "Simplex" disconnector, one of the latest improvements, meets with a good deal of favour. A small department is devoted to electric light fittings, &c. The inspection gave every satisfaction to the visitors. Messrs. Wimperis & Arber were praised for the design by architects themselves, whilst Mr. Bolding received congratulations on all sides. It was altogether a day of good wishes and bright prospects. We cordially share in the anticipations. Luncheon was subsequently served in the adjoining drill-hall, Mr. Bolding presiding. Mr. Pluknett (late of Messrs. Cubitt & Co.) proposed the health and prosperity of the firm in a short speech, in which

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PATENT No. 2496. A.D. 1884.

he expressed the pleasure the inspection of the works had given him, and alluded to his long experience of the quality of the firm's work, with which he was always satisfied. The toast was honoured with "three times three." Mr. Bolding, in a neat little speech, expressed his gratitude for the kind expressions of good feeling towards him. The object of the firm had been only to do the best work, and he had been greatly assisted in this object by an able staff, who had been brought up in the business and knew every requirement. With his workmen generally he was in the most perfect accord. In some instances he had in his employ three generations in one family—boy, father and grandfather. In conclusion, he had built the new works to be in advance of the times, and he intended to do his best to please his clients. Mr. Arber, responding to repeated calls for "The Architects," thanked the company on behalf of Mr. Wimperis and himself for the appreciation their work had met with, and hoped the business of Messrs. John Bolding & Sons would increase so rapidly that a further extension would be necessary. We unite in wishing the firm a new era of deserved success.

FIREPROOF ROOF CONSTRUCTION.*

ROOF construction of a building is a very important point of fireproof construction, this being the access of fire from above, caused by sparks and flames of any burning neighbouring structure. The cheapest and best fireproof construction that can be obtained is gained by the use of T iron and book tile. T irons should be regularly spaced at 18-inch centres, following outline of slopes in roof which is given by the change of level of roof beams upon which T irons rest. These T's should be held in position with iron clamps to roof beams. Two and one-half inch or 3-inch T's are generally used for this mode of construction. The size of the T iron governs the size of the book tile that has to be laid between them. If 2½-inch T's are used, 2½-inch tile must be used. This will bring the top of the tile about ⅜ of an inch over the edge of the stem of the T. The name of book tile is given this tile, owing to its shape which is like a book. Good tight joints are obtained by using this tile, as one tile fits in the other, which does away with a vertical joint, which in no case should be allowed on a roof. All tiles should be bedded in mortar and all joints along T's should be slushed up, leaving an entire smooth surface. If a concrete is desired on this roof, upon which tarred paper and gravel is to be laid, it should never be composed of either cinders or crushed stone mixed with sand and cement and water. This is a glaring error which is quite frequently indulged in. No matter how hard you try to get an even surface, you will always find a cinder or stone here and there sticking up, which cuts through the tarred paper, and if walked upon injures the roof. A concrete composed of sand and cement will answer first for this purpose. I cannot see why it is that a concrete is at all necessary. It is better for the roofer and cheaper to apply the tarred paper direct on the tile, using a ply or two more of tarred paper. The cost of same is amply made up by omitting concrete. These remarks applied to flat roofs. Where roofs have a rake not over 45 degrees a similar construction (as aforementioned) regarding tile work can be followed. If rake or roof is any steeper, each tile should be either wired or bolted to T-irons. This is especially necessary when a part of the roof drops off to a vertical line. One or two-ply of tarred paper should cover these roofs before slates or roof tile are nailed to them. Roofs that are to be used as promenade decks require a stronger construction; regular floor arches are required here. Trusses that support roofs or carry additional loads should be thoroughly fireproof, as this is a vital point of fireproof construction. If this is not done it exposes the steel and iron to the heat of a fire that may start below them; consequently a grave danger threatens the destruction of the trusses and whatever they may support. This construction occurs mostly in theatres and large halls. If lower chords of trusses carry a floor, or, in other words, the ceiling of the auditorium, the entire truss should be fireproofed, no matter if it is cut off from below by this floor or ceiling. If truss is so designed that lower chords show below ceiling-line, they should have especial attention as regards fireproofing.

Suspended ceilings are only used to shut off the roof construction from view, and to give a level ceiling, therefore this construction is very light. Hangers are suspended from the roof-beams, to which T-irons, say 3 inches times 3 inches, are attached; spacing latter about 5 feet centres. On these, at right angles to the direction they take, 1-inch T-irons are spaced 12-inch centres. Between the 1-inch 's a light tile is set, to which plastering is applied from below. The general construction of to-day, in our modern fireproof buildings, is to make the ceiling of the last storey as strong as a regular floor. This is

* From a paper read before the Chicago Architectural Sketch Club by Mr. E. H. Hœppner.



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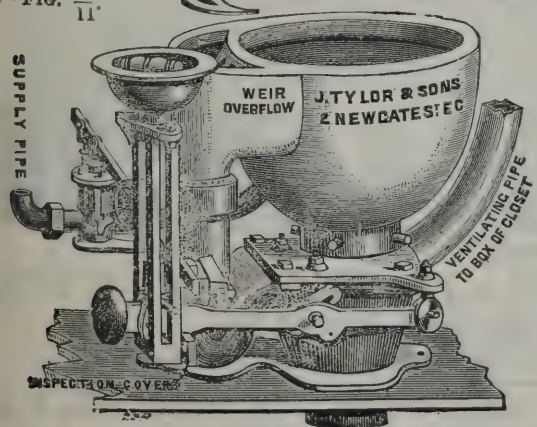
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FIG. 1/11.



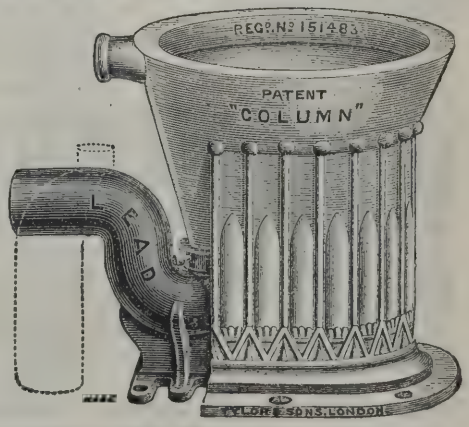
Certificate of Merit Health Exhibition, Brighton, 1890.

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FIG. 1/11.—Patent "Waste Not" Clear Way Valve Closet; Weir Overflow Basin, Flushed each Action; Parallel Pull.

Patent "COLUMN" Closet, with *Lead* Trap. This insures the joint between the Closet and Soil-pipe being well made. The seat can rest direct upon the earthenware.



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THESE ONLY Closets which received Certificates at the Brighton Exhibition.

done to afford ample storage space and still more important space for pipes, tanks and machinery.

Furring of the inside of outside walls with hollow tile is the most thorough preventative against moisture penetrating through a wall. Each tile should be carefully, regularly set. The thickness of tiles used for this purpose are 1½ inch and 2 inches thick. You can therefore see that they depend a great deal on the condition of the wall to which they are to be applied. These walls should be as plumb on the inside as they are on the outside. The use of wood for this purpose should not be allowed, as it is not fireproof or moisture proof. Moisture will affect wood so that dark discolorations will appear on plaster, every lath and strip being clearly shown. Corrugated iron laths and wire lathing are also applied to these walls, but also show the defect of this construction as wood laths. Hollow air spaces are sometimes built in walls to overcome this defect, but that is too expensive a construction and takes more room for walls. The use of porous bricks is the best construction for this purpose. The good qualities of this material have been mentioned before.

Skylight curbs should be built from ceiling-line of last storey, or attic floor, through roof. This is a very important feature of a fireproof structure. No windows should be called for in these curbs. Any light that is necessary for attic should either come direct through roof or through outside walls. These curbs are generally called for to be built of hard glazed tile laid in pure cement mortar, and all joints to be neatly struck. This is supposed to constitute the finish of this part of the work. This construction may look very nice, but it is not fireproof. It is in a dangerous locality, as the draft of any fire that may occur in the storey below will invariably be carried up in this direction, owing to the ventilators in the skylight above. Heat and water will splinter this wall in a very short time. Consequently flames and smoke will have access to the exposed roof construction, water tanks, machinery, vent flues, steam and water-pipes, &c., which are located in this part of the building, and will cause dire ruin and paralyse the machinery and sanitary fixtures of the entire building. These skylight curbs should, therefore, be built of a material that will withstand the combined attack of fire and water.

Elevator pockets should be built in every elevator, in order to shut off any smell, flames or smoke that may arise from defective machinery or sanitary arrangements in basement, as a tremendous draught is always rushing up these shafts. This would not be very pleasant or healthy for the occupants of the building. I would even cut off the useful freight elevator from running down to basement, if a partition, which would stop this draught, were not built around same in basement. Such a partition should be set back from elevator, allowing ample room to load and unload freight from same. Elevator pockets should be built as follows :—T iron should be suspended below first floor on hangers about 18 inches or 2 feet below floor beams, spacing T's 18-inch centres and setting book tile between same. Walls of pockets should be built of 3-inch partition tile. Stairs that start from basement and run up to roof should also be cut off from rest of basement by a similar partition as mentioned about freight elevator. Also for similar reasons.

Especial attention should be paid to see that all beams in pipe-shaft which enclose cylinders of elevators and pipes are thoroughly covered, making due allowance in the framing of your ironwork that sufficient space is given to allow of one continuous line of tile. One of these shafts, should a fire get into it, would act like a huge chimney. All beams in elevator shaft and stair wells should be covered. If ornamental iron fascias are called for on these beams, then the construction of same should be so designed that the iron contractor is not obliged to knock off fireproofing in order to connect his work to floor beams. The fireproofing of the beams, to which guides are attached, should never be done until guides are in place.

Raised floors for water-closets are used when the construction of a building is of such a nature as not to admit of enough space or room to carry pipes in a distinct and separate passage. These floors are built of either book tile and partition tile or book tile, partition tile and T irons. When book tile and partition tile are used, partition tile are built in rows, about 18-inch centres, to any height upon which book tile are set. If T irons are used in addition to these tiles, partition tile are spaced in rows about 5-feet centres, upon which 'sa re set at 18-inch centres for book tile, which is to be set on T's. This will admit of ample space for all pipes below floor.

Framing of iron construction is a very important feature regarding fireproofing—flat-arch construction. All beams should be spaced as regularly as possible. All lower flanges of beams must be on a level line. If beams are all to be level on top, they must be necessarily the same size. Channels or flat bars must be built in walls to receive skewbacks. Flat bars are preferable to channels and are cheaper. Tie rods should be spaced not more than 6 feet apart, for framing around stair wells and light shafts ; tie rods should be spaced not more than

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5 feet apart. If a 15-inch beam is used and a 9-inch arch is to be built between them, tie-rods should be put in 4½ inches from bottom or lower flange, or beam will be tipped over. This is especially dangerous at well holes. If a 9-inch I and a 9-inch arch are used, tie-rods should be placed in centre of beam. For like construction of different sizes of material, a similar proportion of location of tie-rods is necessary. All pipe-shafts, dumb elevators, vents and fireplaces should have iron framework around them. I beams should be used instead of channels for this purpose, as fireproofing can be more securely fastened around them. If a 20-inch girder is level on top with a 9-inch beam, then angles should be rivetted to web of 20-inch girder 9 inches from top flange. The levels of all lintels in relation to floor lines and wood finish, should be carefully studied, raising same enough to allow ample room to apply fireproofing. This will vary at every step from 1 inch to 2½ inches, according to width of lintel. In complicated framing especial attention should be given if fireproofer can apply his fireproofing after everything is framed together. Cases turn up every now and then where it is an impossibility to cover a certain vital point, after all framework is in place, which should have been put in at the same time it was framed together.

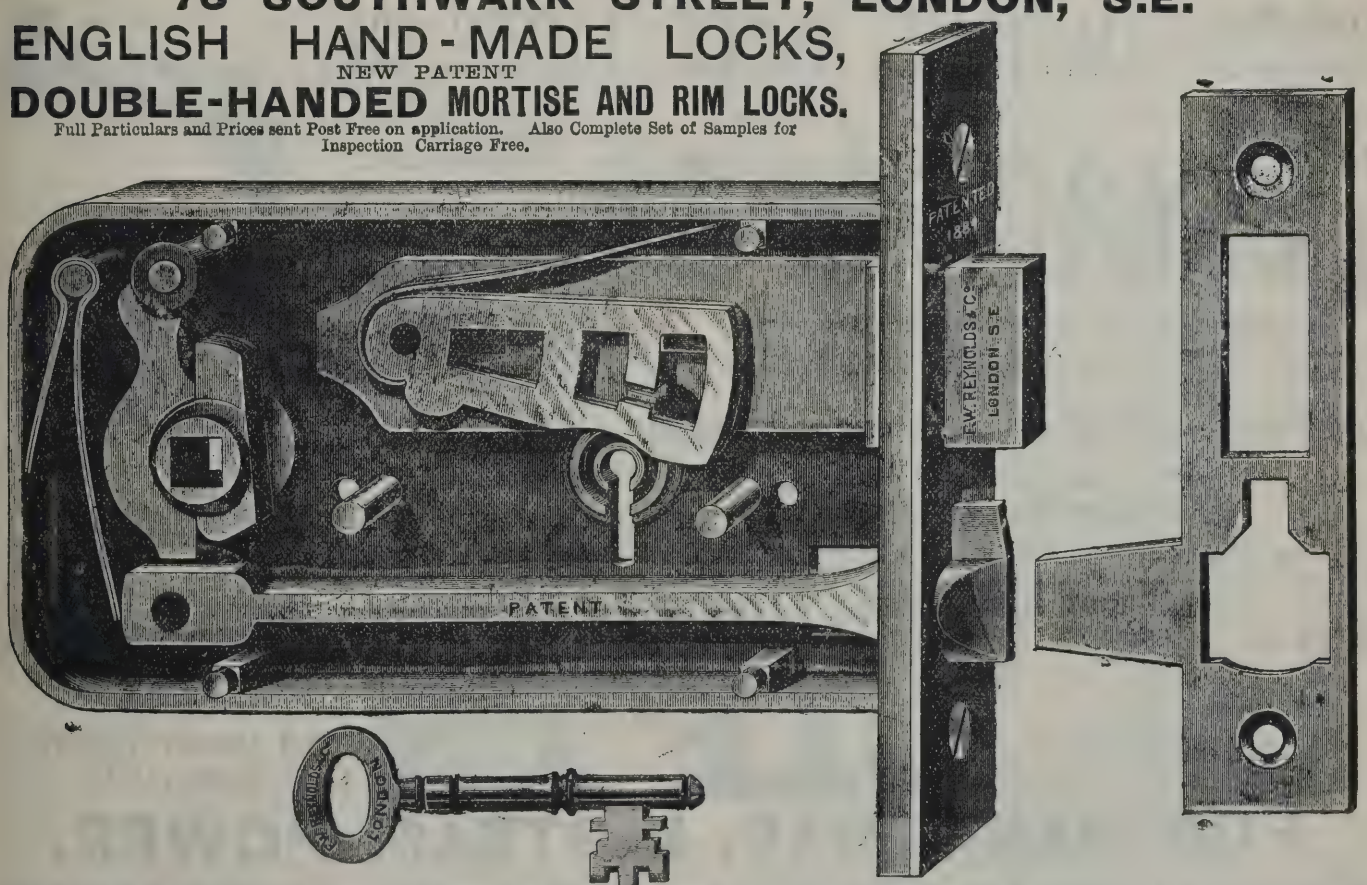
Ample sections and levels should be shown on each plan. Proper allowance for sizes of all well holes and elevator shafts should be made. It should be borne in mind that at least 1 inch should be allowed over edge of I beam at these openings for fireproofing. To this you have to make allowances for ornamental iron fascias, &c. Roof beams should be securely tied together with tie rods. This is especially necessary when beams are carried on walls, the weight of parapet and firewalls being in many instances too light and weak to stand the thrust of a series of arches. Anchors and plates should be used quite freely if you have a similar construction. These remarks apply to roofs where arches are used. If floor beams are carried on an iron skeleton which is built in walls, a similar construction is advisable when you get up as high as the attic floors and roofs. When bolts are used for connecting one beam to another, the threads of same should finish flush with the head of the nut, or should be turned around, leaving head of nut on outside. This is imperatively necessary ; if it is not done, most of the skewback or butt has to be cut to pieces as a square bearing is necessary. This will naturally weaken the entire arch.

T irons for roof construction should be spaced regularly. Odd spaces to be worked over next to walls. T's should also be securely fastened to roof beams with clamps. Ceiling should be spaced similar to roof T's. Clamps are not necessary. Spacing of 's for bay construction should be carefully looked after. Odd spaces should always be worked over to end walls. If cantilever brackets occur a similar spacing should be followed, leaving odd space against bracket. Complete sections should be given of this work for every floor if there is any change of levels, showing if T's are bent over flanges of beams or rest direct on them, also showing whether you want a level ceiling or not. If cantilever brackets frame into a plate girder from one side and floor beams from another side, and a level ceiling is required, then rivetheads in lower flanges of girder should be countersunk. Ample room should be given around columns for fireproofing, so that a whole block of tile at least 3 inches thick can be built up independent of clamps or wire. In no instance should the fireproofing around the column be omitted for the sake of lack of room to case same with marble. If all these points would receive a little more attention, many hours of bother and worry would be spared to the party who is designing a building where such construction occurs. All these items should be carefully shown on plans, and superintendents should see that they are carried out as shown.

Plans and specifications for fireproofing should clearly and distinctly specify what is required. Details and section, &c., should be shown of everything required. It is simply appalling to read some of the specifications of this work that are written nowadays. Everything is left for the fireproofer to ferret out as best he can. This is entirely wrong, as it shows either a lack of knowledge of this important branch of building construction or disgraceful carelessness. Each and every different piece of work should be itemised, noting in what storeys each kind of work is wanted and sizes of material required. A new specification must be written for every new building, as it is impossible to expect a standard or office specification to hold good regarding construction of work, owing to great variations in design. They are at the same time confusing and misleading, causing an endless amount of bother.

Iron contractor should furnish every piece of iron construction regarding framing work. Small T irons and clamps under lintels should be furnished by fireproofer. All holes for pipes through floors and partitions, &c., should be bored by plumber, gas or steam-fitter. Plasterer should replace all tiles he has displaced during his work. And finally, one and all contractors

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should be held responsible for any damage to work of another contractor, any cost of replacing such work to be charged to him and taken out of his final payment. It will be found that, by making such rulings as just mentioned, you will not be continually called upon to settle clashes that occur between contractors and owners of buildings.

For heights of long partitions that are not braced or bonded into any cross partitions, the following rules regarding thickness of partitions should be followed :—Three-inch partition, 12 feet high; 3½-inch partition, 13 feet high; 4-inch partition, 14 feet 6 inches high; 5-inch partition, 17 feet 6 inches high; 6-inch partition, 20 feet high; 8-inch partition, 25 feet high.

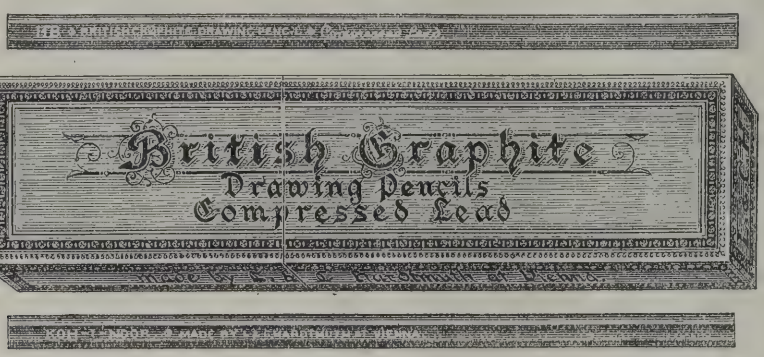
Partitions can be built a great deal higher, but have to be built in such a manner that a space is left between, which is governed by the height desired. This, of course, necessitates two rows of tile, or double partition, as lateral stiffness is what you have to look out for. Smoke stacks and elevator shafts can be built to any height desired if the proper sized tiles are selected.

For spans of flat floor arches, the following sized spans should be used. These spans are the extreme limit which is to be allowed. Six-inch arch, 5 feet; 7-inch arch, 5 feet 6 inches; 8-inch arch, 6 feet; 9-inch arch, 6 feet 6 inches; 10-inch arch, 7 feet; 12-inch arch, 7 feet 6 inches. The spacing of beams should not be governed by any sized span given to you, but should be governed by the load that is to be applied on beams. If it is found that strength of beams is sufficient for such spans, that settles all questions regarding same.

If fireproofers are called on to estimate on any work where iron construction is used, they require both iron and general diagram.

NEW CATALOGUES.

WE have received samples of drawing materials from Messrs. L. & C. Hardtmuth, of Golden Lane, Barbican, E.C., and Vienna. Among the pencils is the Koh-i-Noor new hexagon drawing pencil named British graphite, made in 12 degrees from 6B to 6H. Messrs. Hardtmuth say of it :—"After many years of experimenting with the various graphites of the world, we are able to lay before the public a pencil that is without question immeasurably superior to anything that has hitherto been produced, both regarding its erasing and its delightful smooth writing qualities. The many testimonials which we are now receiving regarding it prove that it has already secured the approval of many who are able to judge." There are also new school and office pencils, a new spiral programme pencil, and the artist's safety pencil. The drawing pins are of an improved kind, and an extractor is furnished with them. In conclusion we may add that, having tried Messrs. Hardtmuth's new Koh-i-Noor pencils, we can confidently recommend them to architects, engineers, draughtsmen, &c.; we have failed to discover any grit, neither have we had any difficulty in erasing. Messrs. Hardtmuth's name as pencil manufacturers is so well known that further comment is unnecessary.



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PROPOSED AMERICAN BUILDING LAW.

A COMMITTEE of delegates from the American Institute of Architects, the National Association of Master Builders, the National Association of Building Inspectors, the National Board of Underwriters and the National Association of Fire Engineers have recommended the following as the essential points for a building law :—

1. That all buildings over 70 feet in height be constructed throughout of incombustible materials, protected in the most approved manner for resisting fire.

2. That interior structural ironwork in all buildings be covered and protected by fireproof material.

3. That all buildings over 50 feet in height be furnished with permanent standpipes and ladders for the assistance of the Fire Department.

4. That the height of buildings to be erected should not be more than two and one-half times the width of the principal street on which they are situated, and that no building or portion of a building, except church spires, should be more than 125 feet high, except under a special permit.

5. That the open floor-space, not divided by walls of brick or other combustible material, in all buildings hereafter erected for mercantile or for manufacturing purposes, should not exceed 6,000 square feet, without special permission, based upon unusual and satisfactory precautions.

6. That every building to be erected, which shall be three storeys high or more, except dwelling-houses for one family, and which shall cover an area of more than 2,500 square feet, should be provided with incombustible staircases, enclosed in brick walls, at the rate of one such staircase for every 2,500 square feet in area of ground covered.

7. That wooden buildings, erected within 18 inches of the line between the lot on which they stand and the adjoining property, should have the walls next to the adjoining property of brick, or, when built within 3 feet of each other, should have the walls next to each other built of brick.

8. That the owner of an estate on which a fire originates should be responsible for damage caused by the spread of the fire beyond his own estate, if it should be proved that in his building the foregoing provisions were not complied with. A certificate from the inspector of buildings shall be considered sufficient evidence of such compliance, if the building shall not have been altered since the certificate was issued.

VENTILATION OF THE HOUSE OF COMMONS.

AT the first meeting the committee, consisting of the Right Hon. David Plunket (chairman), Sir Henry Roscoe, Sir Guyer Hunter, Dr. Farquharson, and Mr. Richard Power, the question of the ventilation of the House of Commons was considered.

Mr. James Taylor, surveyor to Her Majesty's Office of Works, gave evidence as to improvements which might be carried out for the better ventilation of the committee-rooms and corridors of the House. He was in favour, on the whole, of the substitution of the plus-pressure system for the system of extraction by means of furnaces. The adoption of that system in the debating chamber would not interfere with the ventilation of the corridors, and that was the system he would employ if he were constructing a new House of Commons.

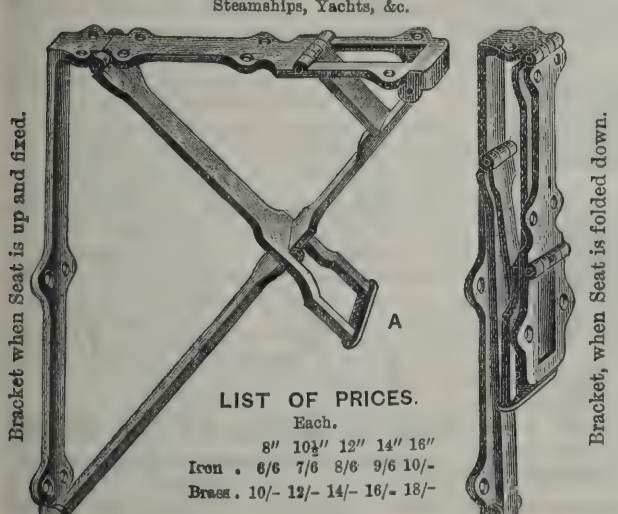
Mr. William Prim, consulting engineer to Her Majesty's Office of Works, gave evidence as to the improvements which had been effected in the ventilation of the kitchens and in the air intakes in the "No" division lobby. In the "Aye" division lobby no change had been made, but it was proposed to make a great alteration where the tellers stood, so as to take off some of the air from there while a division was in progress. There were complaints now of draughts by reason of the opening of all the doors right through the House down to the terrace to allow the rush of members for a division. Explaining the system adopted to keep out fog, he said the openings from the courtyards were closed and the chamber sealed as much as possible against fog coming in from the sides. Air was drawn in from the terrace and passed through jets of water, so that the heavy particles might be deposited. It was then driven by a fan through layers of cotton-wool, 6 feet thick, and after thus filtered it passed through the body of the House. In a short time the wool became black and full of an oily and sooty substance, which had the smell of a very bad fog. There was a considerable difference between the colour of the outer and inner layers of cotton, the latter being much whiter. When they changed the wool they put the inner layer outside and a fresh layer inside. It depended upon the density of the fog how often the wool required changing; he had known it need renewing after forty-eight hours on one occasion when they had a continuous fog for that time. Last winter it was changed three times, at a cost each time of 20*l.*, so that the air of the

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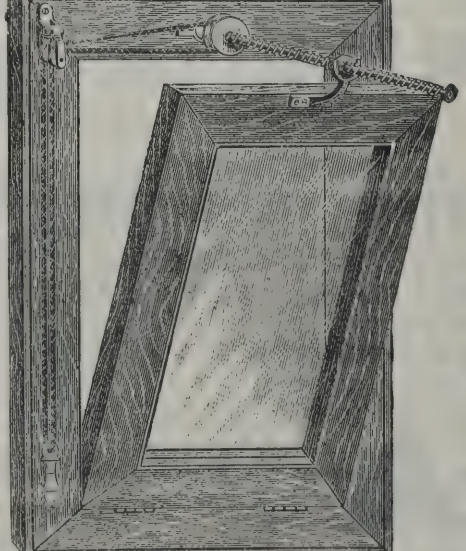


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House was filtered at a cost of 60*l.*, the original expense of the steam that worked the fan having been 200*l.* or 300*l.* The present filter could be extended further along the vault, but he left that question over till it was decided what should be done in other directions, Sir Henry Roscoe, for instance, having expressed an opinion that the filter should be in constant use. Speaking of the quantity of air supplied to the House, he said that on the second reading of the Government of Ireland Bill in June 1886, the quantity of air supplied to the House of Commons was 1,200,000 cubic feet per hour, while the number of persons in the chamber at the time of the division was 905, made up as follows :—Members, ayes, 311 ; noes, 341—total of 657. Strangers, including the occupants of the Ladies' Gallery, 232 ; and clerks, doorkeepers and attendants, 11. Thus the air supplied per individual was at the rate of 1,326 cubic feet per hour, or 22 cubic feet per minute, while the cubical contents of the Chamber being 165,000 feet, the air therein was changed every eight and a quarter minutes, or 7·272 times in an hour. On the occasion in question the temperature both of the Chamber and out-of-doors was as follows :—At 4 P.M., 65 deg. out-of-doors and 63 deg. in the Chamber ; at 5 P.M., 67 deg. out-of-doors and 65 deg. in the Chamber ; at 7 P.M., 64 deg. out-of-doors and 67 deg. in the Chamber ; at 10 P.M., 59 deg. out-of-doors and 64 deg. in the Chamber ; and at 1 A.M., 56 deg. out-of-doors and 67 deg. in the Chamber. The increased temperature of the Chamber between the hours of 10 P.M. and 1 A.M. was in a great measure attributable to the crowding of members at the chair and bar ends of the House, where the thermometers are fixed. Attendants went round and took the temperature right through the whole building every hour, and a record of the temperature was kept for every hour of every day during the session. Sometimes when the House had been sitting for a long time he was asked by the Speaker or the Serjeant-at-Arms to raise the temperature and to keep it high as the night advanced, when, no doubt, members got tired and required more warmth. If an individual member asked to have the temperature raised, he referred him to the Speaker. Mr. Cowen had said that he never knew a building that took it out of a man so much as the House of Commons. But when witness asked him whether he had ever spent so many hours in another place, such as a church or the Royal Italian Opera, he admitted that he had not. Mr. Prim then went on to speak of the way in which the House was warmed in cold weather and cooled in hot weather by means of cold air passing through a steam arrangement called batteries. The temperature in the debating chamber of the House was kept pretty equal at from 62 degrees to 64 degrees, except when the outside shade temperature was very high, when the House would feel like an ice-well, with a temperature as low as 64 degrees. Bad smells came into the House from passing barges, steamboats sent in smoke, and when there was an easterly wind they got smoke and fumes from the potteries on the other side of the river. But on the whole he preferred the air from the terrace to the air from the courtyard. As to further improvements in the ventilation of the House, he said it was proposed to open some flues which formerly supplied the ladies' gallery with air, but they were stopped up as being inconvenient, and in that case the ladies' gallery would receive a supply of fresh air above the heads of the reporters instead of from below. The Strangers' Gallery was plentifully supplied with fresh air, but regarding the House as a theatre, the Strangers' Gallery representing the boxes and floor of the House the pit, it would be impossible to prevent the air from the Strangers' Gallery passing into the House.

NOTES ON TIMBER.—III.

Scaffold and Ladder Poles.—As already stated, these are the young spruce and larch trees, stripped of their branches and chiefly imported from Norway, the smaller sized poles being termed rickers, and sold at about 1*s.* 7*d.* to 2*s.* each, whilst the larger poles are classed according to the diameter of their butts, as over or under 4 inches, and are sold by the foot run at varying prices, according to the supply in the market, of which the following may be taken as samples :—

Scaffold poles,	20 to 30 feet long,		2½*d.*	per foot run.
,,	30 ,, 40	,,	3*d.* to 4*d.*	,,
Ladder poles,	20 ,, 30	,,	3*d.* ,, 4*d.*	,,
,,	30 ,, 40	,,	4*d.* ,, 5*d.*	,,
,,	40 ,, 45	,,	5*d.* ,, 6*d.*	,,
Gross poles	30 ,, 40	,,	6*d.* ,, 7½*d.*	,,
,,	40 ,, 45	,,	7½*d.* ,, 11*d.*	,,

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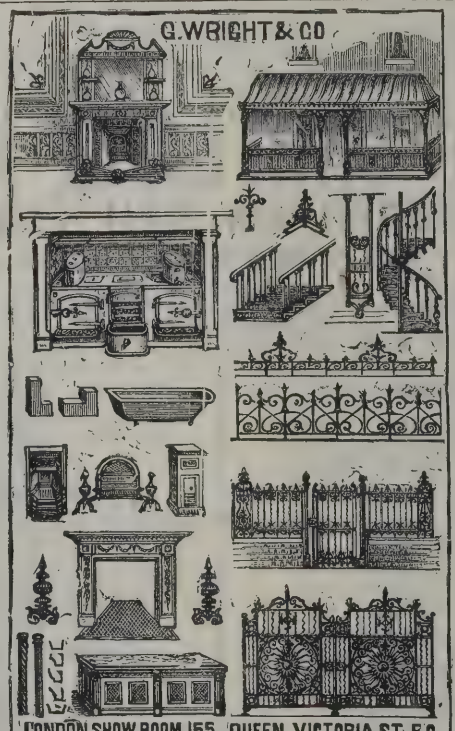
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is called deal. In this form it comes into the market sawn into different widths, which though often collectively classed as deals, are distinguished as battens, deals and planks, varying from 2 inches to 4 inches thick, but mostly 3 inches, and in length from 8 to 20 feet, but chiefly 12 feet, all under 8 feet in length being classed as ends and sold at a cheaper rate. They are termed battens when 7 inches wide and under, deals when from 7 to 9 inches wide, but mostly running 9 inches, and planks when over 9 inches, though mostly running 11 inches in width.

Baltic Deal.—Baltic deal is either called yellow deal, in which case it is merely the red fir timber (Scotch fir or *Pinus sylvestris*) sawn up, or else white deal which is prepared from white fir timber (spruce fir or *Abies excelsa*).

Yellow Deal.—The best yellow deal for building purposes is shipped from the Russian ports of Petersburg, Onega and Archangel, and the Swedish ports of Soderhamn, Gefle, Stockholm and Holmsund. Onega and Archangel, in the White Sea, and Gefle furnish little but deals of the best quality; Petersburg deals are apt to be shaky, leaving a great many centres in the planks and deals, but the best qualities are very clean and free from knots. Wyborg chiefly sends cheap and sappy battens.

The greater portion of the Swedish timber, both converted and unconverted, is coarse and bad, but at the same time some of the very best deals, both yellow and white, come from Gefle and Soderhamn, therefore it is absurd to specify that Swedish timber will on no account be permitted to be used; the majority of the stocks in the market are Swedish, and very few would be any the wiser if a contractor systematically ignored such a clause in a specification. The best Swedish deals run more sound and even in quality than Russian shipments, owing to the different way in which the timber is converted in the two countries. For instance, a balk of Russian timber is all cut into deals, &c., of one quality, and hence the numerous hearts or centres always to be found amongst them, which are so liable to shake and split, whereas in Swedish timber the inner and outer wood in the same balk are converted into different quality deals, the centres being put with a lower class, and hence the high value put upon first-class Swedish goods.

Four-inch deals should never be used for cutting into boards, as they are of necessity cut from the centres of the logs, and 3-inch deals, the general thickness of Russian goods, are also open to the same objection. Swedish 2½-inch and 2-inch deals of good quality are to be preferred to 3-inch, since they are all cut from the sound outer wood, although, being a novelty in the market and therefore their value not being understood, they do not fetch such high prices as the 3-inch. The only good Norwegian yellow deals come from Christiania, but they are very scarce now, only one or two shiploads finding their way to the London markets in the course of the season, therefore it is useless to specify, as is frequently done, that "all floorboards, &c., are to be of the best Christiania yellow deals."

The export of deal from the Russian ports of Dantzic, Memel, Stettin, &c., is almost entirely confined to yellow planks and deck deals, also called red deals, from 2 to 4 inches thick, which are used principally for ship-building, but may often be employed with advantage for cutting up into scantlings suitable for framing of roof trusses and other similar purposes connected with house-building and engineering constructions. The reason why the shipments from these ports are almost entirely confined to timber in its unconverted state is that the wood, from its having been grown in a warmer climate, is coarse and wide in the grain, and therefore could not compete in a converted state —as deals, &c.—with the closer-grained and cleaner exports from the more northerly ports of the Baltic. Whilst, on the other hand, though hewn timber could be obtained from the northern ports of the Baltic of a cleaner and closer grain, owing to the slower growth, than that got from the more southerly ports, the extra price which would be charged for freight would be quite sufficient to put it out of a market in which the competition is so keen.

White Deal.—Some of the best white deals come from Christiania, but that from the other Norwegian ports is not to be relied on, being apt to warp and split in drying; large quantities, however, of these inferior shipments are used for such common purposes as making packing-cases, &c. The best Russian white deals, &c., are shipped from Onega. Petersburg white deal, though generally finer and closer in the grain, is given to shrinking and swelling according to the hygrometric state of the atmosphere. Riga, which is about the most southerly port from which considerable shipments of deals are made, sends white deals only into the market; they are, however, considered to be inferior to Narva and Petersburg white deals, being coarser and more open-grained than either.

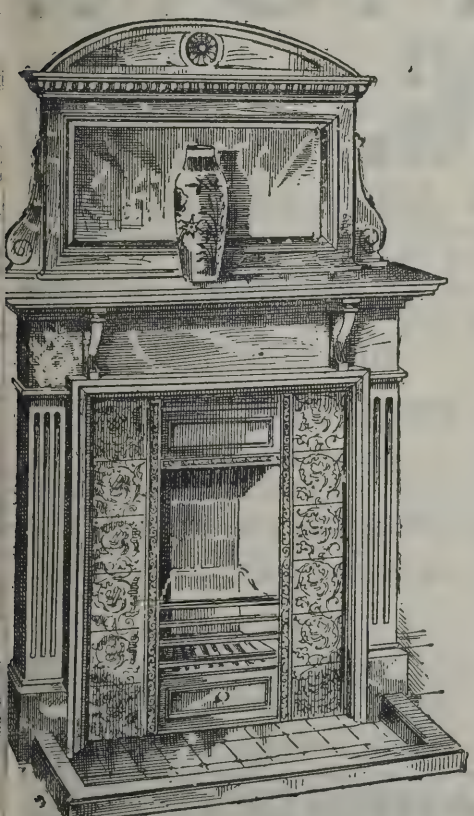
In white deal the sap wood can hardly be distinguished from the heart wood, whereas a lot of yellow deals may readily be recognised by the sap wood, which more or less discolours the edges of most of the deals. The annual rings in white deal are not so marked or red coloured as in yellow deal, whilst the knots are much harder to cut with a knife, and very liable t

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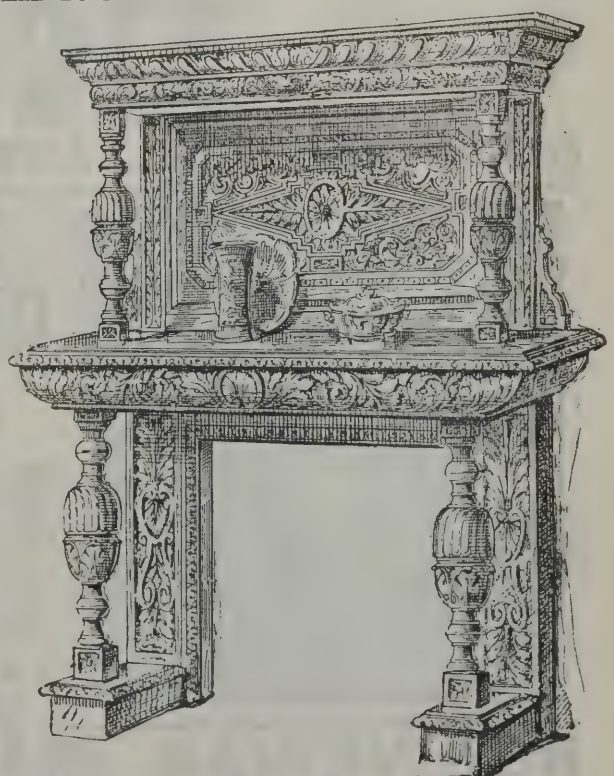
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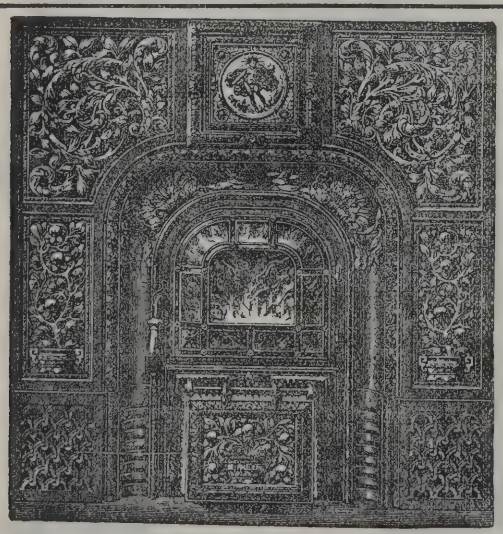
become loose. It is not so durable as yellow deal, especially under exposure to the weather, but is much used for internal work, such as cheap doors and floors not exposed to great wear and tear; it is nice clean wood for tops of dressers and common tables, as also for shelves, but on account of its liability to warp should not be cut too thin, not under an inch if possible.

THE MANCHESTER SHIP CANAL.

SINCE the flooding of the length of the Manchester Ship Canal between Eastham and Ellesmere Port some disquieting statements have, the *Manchester Guardian* says, been made with regard to slips and breaches in the embankment. It has been even suggested that a great portion of the embankment will have to be "reconstructed in a much more solid form." It may be well to say that there is not the least reason for alarm. Some mishaps, as was inevitable, have occurred, but all the injury that has been done a very few days' work will put right. The Eastham cutting was in progress for four years, and during that time was free from floods. It would have been remarkable if, when the water was at length admitted, there had been no such sliding of the banks as has occurred. But to speak of reconstruction in the large style quoted above is not unlike suggesting that a new mansion should be rebuilt because a small portion of freshly-placed stucco work had fallen. The bed of the canal is in some places of sand, and in others of rock. The slopes are for the most part of rubble handpitching, though in some parts fascine work, as in the low country canals, is used. Where the small slips or slides have occurred, the bed is of the more flimsy character, but there is absolutely no cause for anxiety. What has occurred was expected to occur, and possibilities much more serious had to be faced when the water was let in. There were indeed engineers who thought that the banks might in places be torn up by the sudden flood. There are altogether 70 miles of canal banks. For the most part they run through solid earth, in which of course no breach can occur. Where embankments have been necessary the Canal Company have gone to considerable expense in providing a superior kind of masonry, not a stone of which has given way. Now that the Eastham part of the canal is full, the motive power that has caused the small disturbances of which so much has been made is no longer at work.

Within a very few days the traffic of the Shropshire Union Canal from Ellesmere Port will pass down the ship canal and enter the Mersey through the Eastham gates. A hundred yards below the port the flooded portion of the ship canal is dammed up. At the point where the dam is made there is a breach in the estuary line of the canal wall. The opening is not wide, but it allows the tide to come up to the port, and is the present exit and entrance for barge traffic. When in the course of a few days all is ready for the operation the breach will be closed and the dam removed, and the only tide which Ellesmere will know is the tide which will come up the ship canal. Within five or six weeks after this portion of the work is accomplished, a stage even more interesting will have been reached. This will be the opening of a further length of about nine miles, stretching from Ellesmere Port to the mouth of the Weaver. The great salt trade of Winsford and Northwich will then be carried by way of the canal, with the merchandise which comes from the Midland navigations to Northwich, where the remarkable "Anderton lift" is a connecting link. There are a few points between Ellesmere Port and the Weaver at which work has yet to be done. The river Gowy, a tributary of the Mersey, has been one cause of trouble. The Canal Company were not allowed to impound the waters of this stream, and the result was that they had to carry them fifty feet below the surface of the earth, or a depth of sixteen feet below the bed of the canal. A tunnel was built under the new waterway, on the estuary side of which the surface was again found. Two syphons, each of 12 feet, now carry the Gowy on its underground way to the river. This has been a work of great difficulty, and has delayed canal operations at this point. On the excavation of the old bed of the Gowy men and machines are hard at work, and unless some unexpected hindrance occurs the trench will be very quickly completed. The course of the canal from Ellesmere Port to the Gowy is cut almost entirely through clay. The railway lines still run along the bottom, and here and there a big piece of machinery is to be seen. All that is left to be done, however, is what the men call "cleaning up." Passing on from here and within the estuary we come to a cutting in clay and sand, which stretches as far as the old Ince lighthouse. The width at the top is not less than 300 feet. On this reclaimed land it has been necessary to build very heavy embankments, finished off with what is known as dressed pitching, inside and out. In making these embankments it was necessary, to gain a firm foundation, to send a vast amount of timber deep into the earth by the process of "piling." At the

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old lighthouse begin the Ince rocks, extending for about a mile. These presented a very solid buttress for the canal-makers to encounter. For four years the workmen have been blasting the barrier away, and to-day it is as clean-cut as sawn timber. At the top of the cutting we look from a height of not less than 70 feet over an absolutely perpendicular cliff. The section extends three and a half miles further, to the mouth of the Weaver. This part of the canal is completely finished, and for four months the surface water has been allowed to accumulate in it, till there is now a uniform depth of 5 feet. This finished portion looks extremely well, for there is no wide estuary with which to compare it. For the most part the straight line of banks is made of pitching, of a sandstone redness, but in places the surface is agreeably broken by fascine work. This style of embankment is not uncommon on the canal, and though it is not perhaps quite so strong a protection as the rock, it is certainly more picturesque. The branches of the osier and the willow are thickly laced and laid in line on the banks, into which they send roots and make firm the soil. Very quickly they send forth shoots, and in places where the planting is not quite recent the banks are now pleasantly green. The canal wall is carried on through the estuary and in front of the mouth of the Weaver. Within the next few weeks that river will discharge itself no longer into the Mersey, but into the canal. The canal people, however, are by Act of Parliament prevented from robbing the Mersey of this quantity of water, and the problem of the engineer was how to meet this condition. This has been done by the erection of the largest sluices which the world has yet known. They are ten in number, each 30 feet wide, and the machinery is so perfect that a young boy could control it. The sluices are used not merely to regulate the passage of the Weaver water out of the canal, but to admit the tidal flow. With their solid masonry and vast roller frames they present a very imposing piece of engineering work. Side by side with the sluices is a weir in the embankment, 600 feet long, at a level of 14 feet 2 inches, which is the mean level of high water and the height at which the water opens the lock gates at Eastham. The embankment of the Weaver pens the water up that river to Frodsham, a distance of three miles from the canal. This will form a large sheet of water which, after dredging, will be available for vessels of any size. A lock is quite complete which will connect this dock with the Weaver navigation (which is built parallel with the river), and through the lock will come the large and important traffic from the salt districts of Cheshire. The lock is of very considerable dimensions, being 229 feet long and 42 feet wide; other locks are being constructed a short distance above the Weaver to admit boats to and from the docks at Weston Point and Runcorn. This work, however, will not be finished for some months to come. It is the length from the mouth of the Weaver to Eastham with which the makers of the canal have been most concerned hitherto, for it was directed by Parliament that this section should be opened before certain points nearer Warrington could be touched.

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ON Saturday a garden party was held at Essex House, Mile End Road, for the purpose of inspecting the new premises of the School of Handicraft. The house, apart from its historic claims of interest, having been built by the Earl of Essex, of Elizabeth's time, has many attractive features. Mr. C. R. Ashbee, the present proprietor of the house, and by profession an architect, has given up his abode in order to advance the knowledge of old English handicrafts, by establishing a school where men can work on a co-operative system and boys may learn various trades. Advantage was taken of the occasion to

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open the new workshops and hall, which had become necessary owing to the growth and development of the school. In accordance with the system carried out ever since the foundation of the school, the work was of an entirely practical nature, and had direct relation to the industrial training of the pupils. Among the new lines of work at present being taken up or about to be taken up by the school, and in addition to those already taught, are classes for brazing and metalwork, gold and silversmith's work, English leather industry, guild and school press. The classes are conducted by professional and skilled men, and are for the training of men in trades or of men who have the training of the young artisans of the future in their hands. In addition to the workrooms, there is a large garden with lawn-tennis courts. The Marquis of Ripon, in the course of his address, welcomed all to the new building. They were fortunate in finding such a locality, and the guild and school had found an excellent habitation. He hoped it would prosper and fulfil all the work it had set before it.

CITY HALL, PHILADELPHIA.

THE *Scientific American* gives details of the progress of the great tower of the City Hall, Philadelphia. No one, it says, has visited Philadelphia without being struck by the splendid pile. For many years its walls have been gradually rising, and although the main portions have been finished and occupied for some time, the tower, which is intended to crown the whole work, has but slowly reached up into the sky. The marble work is now finished, and it only remains to put up the iron upper work, when the whole will be completed. The tower, although unfinished, is already 350 feet high. The total height when completed will be 547 feet 2½ inches, and will only be surpassed in this respect by the Eiffel Tower and the Washington Monument, which surpasses it by less than three feet. Without including the court, the building covers 4½ acres, and has a frontage on one side of 470 feet and on the other of 486½ feet.

John Ord, architect of the city of Philadelphia, who is now in charge of the work inaugurated and carried almost to completion by his predecessor, the late John McArthur, jun., said:—We are now engaged with the construction of the iron superstructure or tower which is to crown the stonework now in position, and make the new City Hall of Philadelphia, when completed, the highest building in the world, with the exception of the Washington monument. In all the work carried on at anything like such an elevation as this, the greatest precaution must be taken to prevent stray nails, blocks of wood and workmen's tools from falling through such a great distance, and to insure against this it is necessary to rig an enormous circular platform, consisting of a hub with huge yellow pine outriggers. This platform will weigh 150 tons when placed in position, and in shape will resemble a huge cartwheel. The centre of the platform, or what I have called the hub, is fastened to the eleventh storey of the tower or the top of the stonework, while the spokes stretch out 55 feet horizontally, extending about 20 feet beyond the outer walls of the tower. These spokes are 15 inches by 18 inches in diameter, and are united by a wrought-iron fish-plate. The outriggers are twenty-four in number, weighing, in all, 168,000 lbs. Joists 3 inches by 14 inches fastened to the outriggers will support an oak plank floor 4 inches thick.

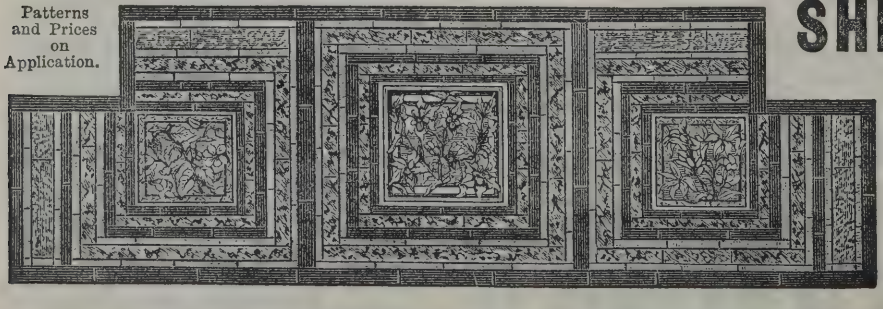
The platform is encircled by a heavy railing, and will be the base of operations for the erection of the most elaborate metal tower in existence. The clock storey of the tower, 67 feet in height, will be supported by sixteen cast-iron columns, each 35 feet long and weighing 15,000 lbs. The supports for this enormous weight will be furnished by a wrought-iron skeleton structure, consisting of eight composite columns resting on four box girders, which are set in position on top of the present granite bond stones, with cast-iron bed-plates to secure a solid bearing throughout the structure. These girders will afford a support for eight vertical columns, standing 67 feet 8 inches above the stonework, and converging at this distance to a recent, in order to furnish a support for the Penn statue.

The columns are made in pieces of varying length, and are to be erected in several stages in height. Each of these stages is to be composed of eight posts, firmly secured and braced horizontally and diagonally, and made absolutely secure before the next succeeding stage is erected. At the level of 67 feet 8 inches above the marble work a floor will be constructed of 9-inch rolled I beams, weighing 70 lbs. per yard, resting on eight cantilever trusses. These trusses will be secured to and spring from each of the main posts, and are to abut upon and be keyed up to a ring of wrought-iron, 3 feet deep and 13 inches clear internal diameter, forming an open "well" in the centre of the floor. Another floor will be constructed on the top of the eleventh stage of seven 55 lb. I beams, which will be covered with cast-iron plates bolted to them. This floor will give access to a small gallery or balcony, which will be supported on strongly-framed wrought-iron brackets and protected with heavy

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railing made of gas-pipe rails and bolts, thoroughly bolted to cast-iron work. A supplementary frame will be constructed outside of this frame, to give support to the outside cast-iron shell. Aluminium will probably be the metal used in the external covering of the dome and in the construction of the ornamental groups. The clock storey is now in course of erection at Tacony, where it is to be erected in its entirety. It will then be taken apart, the segments being carefully numbered and taken to Philadelphia, where they will be put together permanently. The top of the clock storey will, however, be kept at Tacony to serve as a base for building the next storey. An important factor to be considered in the erection of the tower is the elements. Great precautions must be taken against damage by cyclones and heavy gales at such a high altitude. With this end in view calculations have been made, and it is estimated that each square foot of the tower will resist a wind force of 50 lbs. The statue of Penn, which is to surmount the tower, is now about completed, and is said to be the largest iron casting in the world. Penn will be taken to this city in forty-seven pieces, and will measure 36 feet from the soles of his feet to the crown of his hat.

Some idea of the enormous size of this figure may be gleaned from some of the measurements of his person. The enormous height of the tower is shown by the fact that the statue dwindles into a pygmy when mounted on the apex of the tower. The head is 4 feet in diameter, and 7 feet long with the hat on. The nose is 15 inches long, and the distance between the eyes 16 inches. The eyes are 9 inches long and the mouth is 12 inches across. Penn's hat is 12 feet in circumference. It is 4 feet high, and the rim is 8 feet in diameter. It has been estimated that he wears a No. 52 hat. The calf of the leg is 9 feet around, and the upper leg measures 15 feet. The foot is nearly 6 feet long. His finger nails are 5 inches long, and the middle finger is 2 feet 6 inches long.

The four large ornamental figures are also of cast-iron structurally. They are a hunter, an Indian with a boy, a Swede, an Indian with a dog. Each of these figures will be cut into eighteen pieces before being taken to this city. One will be placed over each corner of the clock tower, between them being the four American eagles. Eight lunette windows will furnish light and ventilation to the upper part of the dome. In the construction of the tower at Tacony the greatest efforts were made to secure competent and skilled artisans and to provide all the facilities required for turning out the best work. And it is believed that this has been accomplished. The pins which are to fasten the iron pieces together are of hardened steel 2½ inches in diameter and 16 inches in length. The plaster models from which the clock storey and the statue have been fashioned were all made at this office. A delicate piece of work will be the placing in position of the statue. The pieces of which it is composed will be carried from the base of the tower to the scaffold by the tower elevator. Here by steam power they will be elevated piece by piece and placed in permanent position, beginning with the feet and building upward. Special hoisting machines will be employed to elevate the heavier pieces of the iron superstructure. Each separate piece of cast-iron work, and also the fastenings, after being fitted, will be heated to a temperature of 300 deg. F. and immersed in a bath of pure linseed oil. Another interesting piece of work will be the counterpoising of the statue. This will be done by means of a mass of metal 5 feet long and 2 feet in diameter, firmly keyed into a flanged shaft, which in turn is keyed into the cast-iron cap-piece of the statue. Great care will be observed in constructing the machinery that will be used in elevating the statue of Penn and placing it in position. This apparatus will consist of eight huge timber posts secnrely fixed below the base of the statue. To these posts stout tackle will be attached, and steel cables will be employed to hold the different parts of the statue in position while awaiting permanent position.

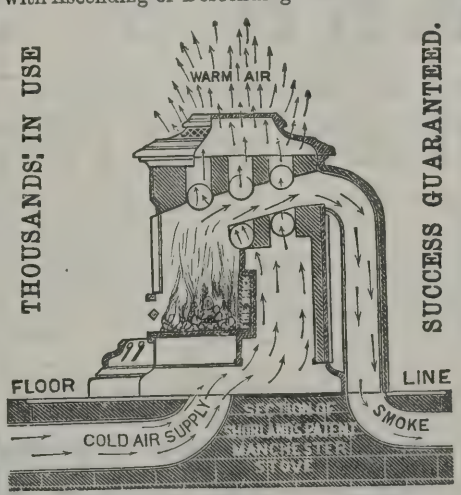
THE LONDON HOSPITAL.

THE Duke of Cambridge, as president of the London Hospital, paid a visit on Saturday, the 27th ult., to the East End for the purpose of opening the new buildings which have just been added to the London Hospital. The new front which has been added to the hospital gives it a far more stately and imposing effect than that of the flat, dingy-looking walls which were such a familiar feature of Whitechapel Road, but it was not on account of æsthetic considerations that the important alterations were undertaken. For a long time past the growing demands upon the hospital have rendered its very limited accommodation extremely inconvenient, the operating theatre in particular being totally inadequate to the requirements of modern surgery. The additions made begin with a fine portico entrance from the street, through which the main hall of the building is reached. On the right side are the waiting and receiving-rooms, rooms for the examination of both male and female patients, and some rooms for the nurses. On the

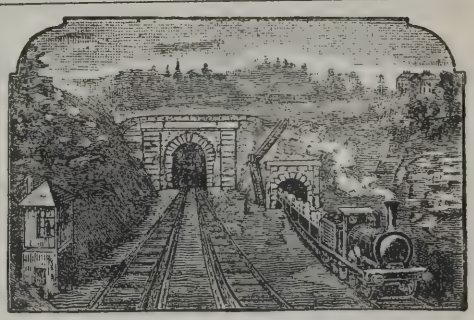
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left side the chief apartment is the students' day-room. On the first floor most of the space is filled by the new chapel, and on the second floor are the well-arranged surgical and clinical theatres. Both these rooms are 40 feet long and 23 feet wide, and are beautifully lighted from the roof. Mr. Roland Plumbe was the architect. The entire expenditure has been 16,000*l.* for the buildings, and 9,500*l.* for the general repair of the sanitary arrangements throughout the hospital. Of this a very large sum remains yet to be raised. After the opening ceremony the Duke, before the dedication of the chapel, inspected the alterations that had been made.

No unnecessary money has been spent upon the ornamentation of the chapel, which, however, looks bright and devotional with its good proportions and painted walls. It is about 80 feet long, and has a gallery at the western end. A handsome stained-glass east window has been given by Mrs. Coope and her family in memory of her late husband, Mr. O. E. Coope, M.P., who was a generous benefactor to the hospital. The seats, pulpit and chancel furniture of the old chapel have been used again, and the former organ will also be restored in due course.

REGISTRATION OF PLUMBERS.

AT a meeting of the District Council for the counties of Forfar, Perth and Fife, held at the Town Hall, Dundee, the committee's report on the examination of students in the plumbers' classes for the prizes offered by the Plumbers' Company, London, was read and approved. The names of the successful students are as follows :—J. Littlejohn, A. Young, A. Ferguson, P. Edmonds and T. Kinnear (Dundee class) ; A. White, R. Emslie, D. C. Clark and G. Smith (Montrose class) ; T. Grant and J. Carver (Arbroath class). A communication was read from the Glasgow Council as to the programme of business of the Congress of Representatives of all the District Councils of Scotland to be held in Glasgow on July 29 and 30, and the same was considered satisfactory. The final proof of the programme will be submitted to the several councils early in July. Ten delegates were appointed to represent the Dundee Council at the Congress, viz. :—J. Wood, A. Davidson and J. S. Jack (master plumbers) ; J. Bryan, A. Stewart and W. Fenwick (operative plumbers) ; Dr. Lennox, Thomas Kinnear, sanitary inspector, and ex-Bailie Stephenson (public representatives), and J. J. Henderson (secretary of the District Council). The Secretary was also appointed as a delegate from the Council to attend the International Congress of Hygiene to be held in London in August next, and the hope was expressed that Lord Provost Mathewson, Mr. W. Mackison and Mr. Thomas Kinnear, who are at once members of the District Council and delegates from the Town Council of Dundee, would be able to cordially support the various propositions which might be suggested at the Congress in favour of the education and registration of plumbers. It was mentioned that at the Congress opportunities would offer under various sections of the proceedings for the discussion of the education, position, duties and responsibilities of plumbers. Reports were given of the satisfactory progress of the registration movement in Scotland and throughout the United Kingdom.

List of Registered Plumbers.

Provincial Masters.

BELLERBY, W., Robert Street, Harrogate.
BENSON, C., Knaresborough.
BEST, A., Somerset Place, Teignmouth.
CARISS, T., Market Place, Easingwold, Yorks.
CORFE, J., 10 Lingdale Road, Claughton, Birkenhead.
GARLAND, G., Bodmin.
GREAVES, A., 3 Wills Road, Ilkley, Yorks.
HOLDING, J., 4 Woolton Road, Garston, Liverpool.
JOHNSON, C. H., 131 Chatham Street, Liverpool.

Provincial Journeymen.

CAMPBELL, T., 18 Hall Street, Southport.
CLAYFIELD, W. G., 35 Hill Park Crescent, Plymouth.
COATES, G., 5 Westmoreland Street, Harrogate.
ELLERAY, T. W., 3 Thirsk Terrace, Northallerton.
HESFORD, J., Prospect Hill, Haigh, Wigan.
LE GROSS, S., 6 Belmont Street, Plymouth.
MARTIN, T., 26 Elizabeth Street, Preston.
PARFITT, J., 27 Delph Lane, Woodhouse, Leeds.
PRITCHARD, T. J., 16 Howard Street, Iffley Street, Oxford.
RAPER, W. T., Snaith, Yorks.
SCAIFE, J., 16 Westfield View, Wakefield.
SHIRES, J. J., Engineer's Department, G.N.R., Stanningley, Leeds.
TOWNSEND, J., 18 Bishopsgate, Westgate, Wakefield ; and
GORMAN, D., Charleroi, Washington County, United States.

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Solid 1-inch Oak, straight boards, laid and polished, at £6 18*s.* a square.

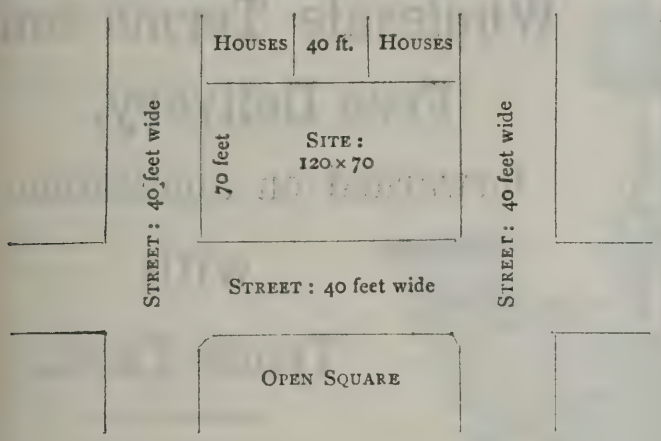
Solid ¼-inch Oak Parquet for covering Deal Floors, laid and polished, from £5 a square.
Oak Wood Tapestry Dadoes, from 1*s.* per foot super.
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GLASGOW ARCHITECTURAL ASSOCIATION STUDENTSHIP.

THE subject for the prize competition for 1892 (twelve guineas) is a design for an art gallery and museum, on a site 120 by 70 feet, as shown in the diagram, to include picture and sculpture galleries, museum and curator's house. Drawings required: plans of each floor, two elevations, one section, one sheet of details. General drawings to be on the scale of $\frac{1}{8}$ inch to a foot. Details to be on the scale of $\frac{1}{2}$ inch to a foot. Anything not expressly stated in the above conditions to be regarded as at the option of competitor. Particular regard will be paid by the adjudicators to the constructive skill displayed. Drawings must be signed by a mark or motto only, and lodged with the Secretary of the Association not later than February 1, 1892.



They must be accompanied by a sealed envelope, endorsed with the mark or motto, and having enclosed the name and address of competitor. Competitors are invited to forward with their design any sketches and measured drawings; the quality of these may influence the adjudication. The successful competitor must arrange within twelve months to make a tour of not less than fourteen days' duration, and out of Scotland, for the purpose of architectural study, and must, on his return, submit to a meeting of the Association, as may be arranged by the general committee, his sketches or measured drawings, and read a paper descriptive of the subjects visited. The competitive drawings will in all cases remain the property of the designer, but the committee may exhibit them either publicly or at an ordinary meeting. The prize for 1892 will be twelve guineas. Power is reserved to decide all questions which may arise, and to withhold the prize should none of the sets of drawings appear of sufficient merit.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and informations relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

10106. Ezra Hatton, for "Improvements in apparatus for wall and window ventilators."

10137. Henry Harris Lake, for "Improvements in the construction of floors."

10177. Thomas Starkey & Son, for "Improvements in door springs, to be called the 'Ratchet grip door spring.'"

10195. Alphonse München, for "Improvements in apparatus for automatically closing spaces beneath and above doors or windows."

10226. William Glazier, for "Improvements in hinges applicable for screens, folding doors, clothes maidens and the like."

10263. Alfred Sutcliffe Cronske, for "Improvements in apparatus for cleaning walls and ceilings."

10270. Rowland Hodges and Francis Jonathan Harlow Lilley, for "Improvements in door indicators."

10297. Theodor Wohlmuth, for "Improvements in locks and in keys therefor."

10384. George Frederick Strawson, sen., and George Frederick Strawson, jun., for "Improved method of attaching glass to roofs, greenhouses and other glazed structures."

10395. John Morris, for "Improvements in roofing tiles."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CASSELL, Patent Agents, 37 Chancery Lane, London, W.C.

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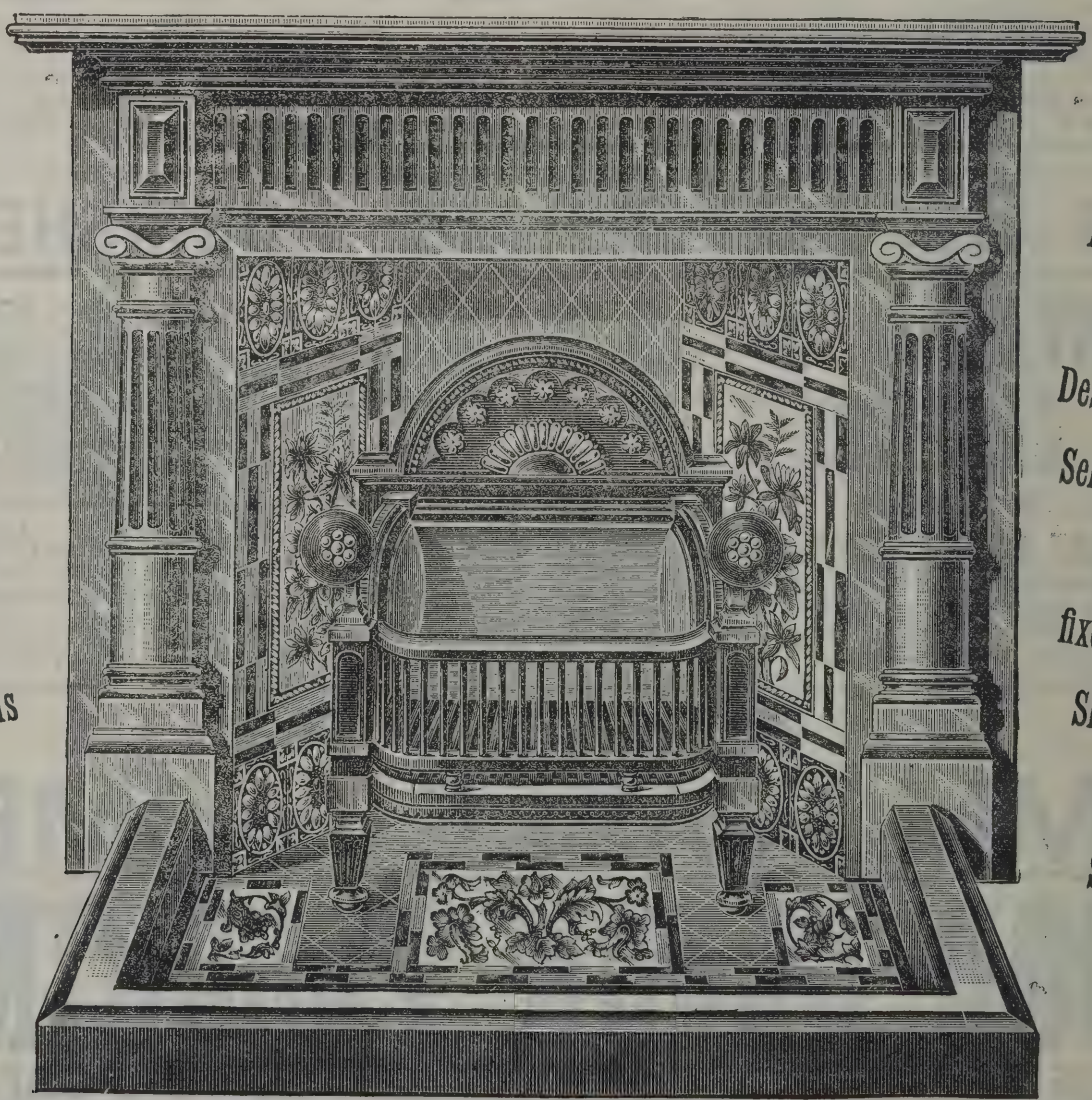
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Friday, July 3, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, JULY 10, 1891.

CONTRACTS OPEN.

ALFRETON.—Aug. 3.—For Building Small Villa. Mr. William Watson, Victoria Buildings, Alfreton.

AVONMOUTH DOCK.—July 22.—For Erection of Police Station. Mr. F. E. Godwin, Surveyor, Heathville Road, Gloucester.

BALDERSTONE.—July 15.—For Additions, &c., to St. Leonard's Church. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BIRMINGHAM.—July 14.—For Construction of Stables and Offices at Curzon Street Station. The Engineer's Office, Euston Station, London.

BLACKWOOD.—July 14.—For Rebuilding Premises. Mr. W. L. Griffiths, Architect, 68 High Street, Newport, Mon.

BONVILSTONE.—July 11.—For Additions, &c., to Cottrell. Mr. Charles Rigg, Architect, 24 High Street, Cardiff.

BRISTOL.—July 15.—For Dwarf Wall and Iron Railing, Victoria Park. Mr. F. Ashmead, Borough Surveyor.

BRISTOL.—July 23.—For Construction of Foundations, Retaining Walls, &c., for Electric Lighting Station. Mr. D. Travers Burges, 51 Prince's Street, Bristol.

BROMLEY.—July 21.—For Supply of Broken Granite, Rockstone and Flints. Mr. R. G. Mullen, Local Board Offices, Bromley, Kent.

BULWELL.—For Building Pottery Works. Mr. S. G. Carlin, Architect, Bulwell, Nottingham.

CARDIFF.—July 21.—For Extension of Ely Schools. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CASWELL BAY.—July 18.—For Building Cottage Residence. Mr. Henry Hall, Architect, 19 Doughty Street, Mecklenburg Square, W.C.

CHELSEA.—July 21.—For Cleaning and Decorating Council Chamber, &c. Mr. Thomas Holland, Town Hall, King's Road, Chelsea, S.W.

CLIFTON.—July 14.—For Building Bird and Reptile House at Zoological Gardens. Messrs. Jones & Bond, Architects, Liverpool Chambers, Corn Street, Bristol.

EBBW VALE.—July 18.—For Waterworks Extension. Mr. T. J. Thomas, Engineer, Local Board Offices, Ebbw Vale.

FULHAM.—July 15.—For Road-making and Paving Works Mr. W. Sykes, Town Hall, Walham Green, S.W.

FULHAM.—July 16.—For Erection of New Lunatic Wards, Lying-in Wards, &c., at the Workhouse. Mr. H. Saxon Snell, Architect, 22 Southampton Buildings, W.C.

GREAT NORTHERN RAILWAY.—July 23.—For Widening the Line between Stanningley and Wortley Junction. Mr. Wm. Latta, Secretary, King's Cross Station, London.

HARROW-ON-THE-HILL.—July 21.—For Additions to Wealdstone Schools. Messrs. Roumieu & Aitchison, 10 Lancaster Place, Strand, W.C.

HEWORTH.—July 11.—For Building Two Villas. Messrs. W. Brown & Son, Architects, Clifford Street, York.

HORSHAM.—July 11.—For Building Cottage, Fay Gate. Mr. William Buck, Architect, 60 West Street, Horsham.

IPSWICH.—July 11.—For Erection of Public Baths. Mr. Thos. W. Cotman, Architect, Northgate Street, Ipswich.

IPSWICH.—July 20.—For Building Twenty-four Houses. Mr. Frank Brown, Architect, Wimbourne House, Tower Street, Ipswich.

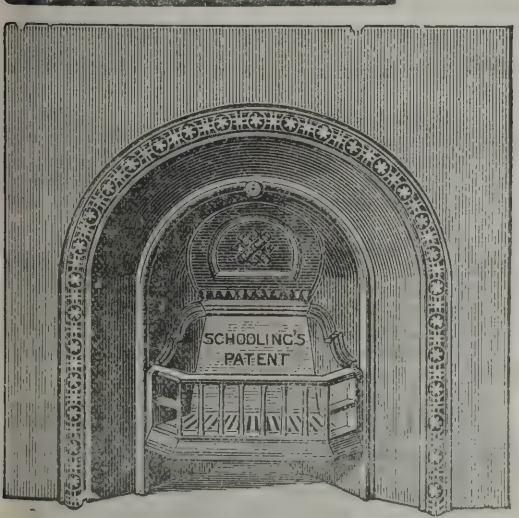
ISLINGTON.—July 20.—For Alterations, Repairs, Painting and Decorating at the Coroner's Court. Mr. Wm. F. Dewey, Vestry Hall, Upper Street, N.

LEWES.—Aug. 22.—For Supply of Broken Granite. Mr. Arthur Holt, Town Hall, Lewes.

LEYTONSTONE.—July 16.—For Erection of Station Buildings. Mr. T. D. Genlloud, Secretary, Great Eastern Railway Company, Liverpool Street Station, E.C.

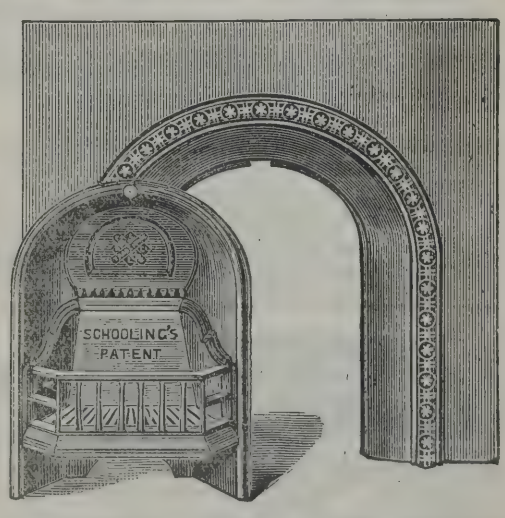
LONDON.—July 21.—For Erection of Weights and Measures Office. Mr. H. De la Hooke, County Council Offices, Spring Gardens, S.W.

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MERTHYR.—July 13.—For Building Theatre, for Theatre Company. Mr. T. C. Wakeling, Architect, Glebeland Street, Merthyr.

MINSTER.—July 15.—For Building Boiler-house, with independent Shaft, Setting Three Cornish Boilers, new Steam Boiler, &c., new Steam-heating Apparatus, Hot-water Supply Deep-well Pump and Horizontal Engine. Messrs. Adams & Son, Engineers, 41 Marshall Street, Golden Square, W.

MOUNTAIN ASH.—July 24.—For Erection of Business Premises and Dwelling-houses. Secretary, Co-operative Society, Cwmbach, near Aberdare.

NEWQUAY.—July 11.—For Building Bank Premises. Mr. H. J. Snell, Architect, Plymouth.

PEMBROKE.—July 13.—For Work in Connection with Water-Supply. Mr. W. McAlpin, Meyrick Street, Pembroke Dock.

PORT WILLIAM.—July 11.—For Building Free Church, Manse and Hall. Mr. Richard Park, Architect, Newton Stewart.

ROCHESTER.—July 14.—For Supply of Flints, Sand, Gravel, Broken Granite, &c. City Surveyor, Guildhall, Rochester.

SHEFFIELD.—July 11.—For Erection of Governor's House and Residence. Mr. F. W. Stevenson, Sheffield United Gas-light Company, Commercial Street, Sheffield.

SHOREDITCH.—July 21.—For Alterations, Additions and Repairs to Gas-meter Testing Station. Mr. H. De la Hooke, County Council Offices, Spring Gardens, S.W.

SOUTHAMPTON.—July 18.—For Building Classroom, Lecture Theatre and Chemical Laboratory. Mr. W. B. G. Bennett, C.E., Municipal Buildings, High Street, Southampton.

SOWERBY BRIDGE.—July 21.—For Building Church Institute and School. Messrs. Horsfall & Williams, Architects, Post Office Buildings, Halifax.

SWINDON.—July 11.—For Construction of Settling Tanks, Mixing-house, Carriers, &c., at Sewerage Farm. Mr. H. J. Hamp, Surveyor, 10 Queen Anne's Buildings, Faringdon Street, New Swindon.

THANET.—July 15.—For Erection of Boiler-house, Setting Boilers and Work in Connection. Messrs. Adams & Son, Engineers, 41 Marshall Street, Golden Square, London, W.

WALSALL.—July 10.—For Heating Chapel and School-rooms. Mr. Joseph Gittings, 156 Wednesbury Road, Walsall.

WATFORD.—July 21.—For Erection of Recreation Hall. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

WALTHAMSTOW.—July 14.—For Repairs to Schools. Mr. W. A. Longmore, 7 Great Alie Street, Whitechapel, E.

WESTMINSTER.—July 20.—For Building Public Library, Baths and Wash-houses. Mr. Francis J. Smith, 17B St. George Street, S.W.

WORCESTER.—July 25.—For Laying Pipe Drains, Kerbing and Channelling. Mr. J. H. Garrett, County Hall, Worcester.

YSTRADYFODWG.—July 11.—For Building Board Schools at Cwmclydach and at Tylorstown. Mr. J. Rees, Architect, Pentre.

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Hutchinson, Nottingham	530 0 0
Fletcher, Beeston	490 0 0
POXON, Long Eaton, Derbyshire (*accepted*)	465 0 0

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For Enlargement of Baptist Chapel and Building Schoolrooms at Burnham. Mr. GEORGE H. TUCKER, Architect, 26 South Side, Weston-super-Mare.

Chedzoy Bros., Bridgwater	£1,450 0 0
G. Randall, Burnham	884 0 0
J. N. Shorney, Weston-super-Mare	795 0 0
J. & C. EMERY, Burnham (*accepted*)	789 0 0

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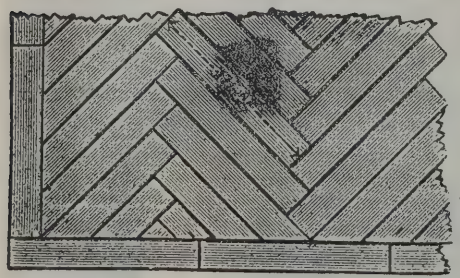
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For the Widening of Barry Road, for the Cadoxton Local Board.

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W. E. Leyshon, Barry Dock	1,143 6 3
W. R. Parker & Co., Cardiff	1,120 11 5
D. Love, Cadoxton	999 14 4
E. J. Ince, Cadoxton	934 3 4

CARDIFF.

For Sewer Extension, Road Improvement, and New Bridge on Penylan Road, Cardiff.

Beans	£5,315 0 0
Ridley	5,230 0 0
Stratan	4,928 0 0
Allen	4,706 0 0
Rees	4,473 0 0
PEARSON (*accepted*)	4,324 0 0

For Widening Road and Attending to the Walls at Penylan.

H. DAVIES (*accepted*)	£365 14 1

For Additions to the Roath Conservative Club. Messrs. VEALL & SANT, Architects, Cardiff. Quantities by Architects.

Blight, Cardiff	£1,569 8 6
Haines, Cardiff	1,539 9 0
Venning, Cardiff	1,495 0 0
Burton & Co., Cardiff	1,485 0 0
Cocks, Cardiff	1,450 10 0
Hodgkinson, Cardiff	1,399 15 9
H. Lewis, Cardiff	1,355 18 3
R. DINHAM, Cardiff (*accepted*)	1,282 10 4
Architect's estimate	1,309 0 0

CARLISLE.

For Heating by Hot-water Pipes the Old Hospital, for the Carlisle Board of Guardians.

Hayton & Sons	£335 10 0

DARTFORD.

For Alterations and Additions to Laundry at Union Workhouse, Dartford. Mr. HENRY RIX-TROTT, Architect, Dartford. Quantities by Architect.

Hewitt, Dartford	£345 0 0
Kemp, Dartford	320 0 0
GUNNING, Erith (*accepted*)	299 10 0

CARMARTHEN.

For Building Police-stations, Burry Port and Llangennech. Mr. DANIEL PHILLIPS, County Surveyor, Carmarthen.

Burry Port.

James & Reynolds, Burry Port	£1,125 0 0
T. & J. Brown, Llanelly	1,122 17 9
Williams & Evans, Llanelly	1,048 14 0
J. Davies, Llanelly	809 0 0
T. Hughes, Llanelly	798 0 0
VIVIAN & Co., Llanelly (*accepted*)	786 0 0

Llangennech.

T. & J. Brown, Llanelly	1,100 0 0
Williams & Evans, Llanelly	1,081 10 0
J. Davies, Llanelly	830 0 0
T. Hughes, Llanelly	810 0 0
VIVIAN & Co., Llanelly (*accepted*)	733 0 0

EASTBOURNE.

For Various Works in connection with the Stormwater Scheme. Mr. H. M. WHITLEY, Engineer.

Contract No. 1.

L. Lloyd	£1,775 0 0
J. HAYWARD (*accepted*)	917 0 0

Contract No. 2.

Penman & Co.	619 0 0
Taylor & Sons	488 0 0
ANDERTON & SONS (*accepted*)	370 0 0

EAST HAM.

For Erecting House and Shop in Wakefield Street, East Ham, for Mr. J. T. Jones. Mr. F. A. ASHTON, Architect, Stratford.

Baskett & Atkins	£1,396 0 0
Hearle & Farrow	1,384 0 0
North Bros.	1,290 0 0
COULSELL BROS. (*accepted*)	1,217 0 0

ECCLESHILL.

For Works in Connection with Chapel Street Infants' School, Eccleshill. Messrs. JOWETT KENDALL & J. HARPER BAKES, Architects, Calverley Chambrs., Victoria Sq., Leeds.

Accepted Tenders.

S. Hobson & Son, Idle, mason	£694 10 0
J. E. Scott, Undercliffe, joiner	187 10 0
T. Norton, Eccleshill, plumber and painter	181 15 0
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T. & A. Thornton, Eccleshill, slater	79 14 0
M. Lee, Eccleshill, plasterer	34 12 0

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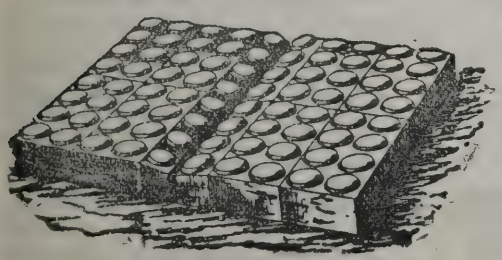
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HADLOW.

For Erection of a new Male Wing and additional Servants' Accommodation to Redlands Private Lunatic Asylum, Hadlow, near Tonbridge, Kent, for Dr. William Millsted Harmer. Messrs. WITHALL & ELLIS, Architects, Suffolk House, Cannon Street. Quantities by Mr. Mark W. King, Fenchurch Avenue.

D. Charteris, Westminster	£5,901 0 0
Jas. Greenwood & Son, Cannon Street	5,881 0 0
W. & T. Denne, Walmer	5,870 0 0
E. Punnett, Tonbridge	5,761 0 0
Killby & Gayford, London	5,727 0 0
G. E. Wallis & Sons, Maidstone	5,444 0 0

ILKESTON.

For Erection of New Schools, Cotmanhay Road, Ilkeston, for the School Board. Mr. GEO. HASLAM, M.S.A., Architect, Euclid House, Ilkeston. Quantities by Architect.

Gilbert & Gabbitass, Nottingham	£3,585 0 0
W. E. SHAW, Ilkeston (*accepted*)	3,525 0 0
G. A. Pillatt, Nottingham	3,386 0 0
Wheatley & Maule, Nottingham	2,349 0 0
B. Keeling, Nottingham	3,327 0 0
S. Poxon, Long Eaton	3,300 0 0
J. Sills & Son, Loughborough	3,270 0 0
J. Brown, Long Eaton	3,140 0 0
Architect's estimate	3,300 0 0

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For Taking up Present Playgrounds at Leicester Street Girls and Infants' Schools and Shrubland Street Girls and Infants' Schools, and Relaying with Asphalte, for the Leamington School Board. Mr. FOSTER, Architect.

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Bradshaw & Co.	£205 12 9
Val de Travers Asphalte Paving Company	202 10 0
ASPHALTIC LIMESTONE CONCRETE CO. (*accptd.*)	170 11 6

Shrubland Street.

Bradshaw & Co.	163 10 6
Val de Travers Asphalte Paving Company	153 5 0
Asphaltic Limestone Concrete Company	135 0 0

LONDON.

For Alterations and Additions to the Stamford Hill Supply Stores, No. 11 Kingsford Terrace, Seven Sisters Road, Stamford Hill, Tottenham. Mr. W. F. POTTER, Architect.

H. DUFFILL, Stamford Hill (*accepted*).

LONDON—*continued.*

For Building Stables at Norwood, with Coachman's Dwelling over, for Mr. Edward Cullen.

		Staffordshire Brick Paving extra.
Smith & Son	£995 0 0	£35 0 0
Masters	973 0 0	24 0 0
Bowyer	936 0 0	28 0 0
W. & H. Castle	894 0 0	—
Bristow	866 0 0	15 10 0

For Rebuilding the King's Head and adjoining Premises, Nos. 27–30 Old Jewry, for Mr. A. F. Austin. Messrs. WITHALL & ELLIS, Architects, Suffolk House, Cannon Street. Quantities by Mr. Mark W. King, Fenchurch Avenue.

Jas. Greenwood & Son	£11,690 0 0
W. H. Lascelles & Co.	11,656 0 0
J. Grover & Son	11,646 0 0
G. H. & A. Bywaters	11,580 0 0
Colls & Sons	11,300 0 0
D. Charteris	10,672 0 0
Killby & Gayford	10,434 0 0
OLIVER CROMWELL, Chislehurst (*accepted*)	10,400 0 0

For Building Additional Wards and Workrooms for Females at their Workhouse, Sidney Road, Homerton, for the Guardians of Hackney Union.

Garlick & Horton, Limited, Sloane Street	£1,999 0 0
W. Brass & Son, Old Street	1,535 0 0
J. H. Mollett, London	1,435 0 0
J. Holland, Poplar	1,298 0 0
A. PORTER, Tottenham (*accepted*)	1,183 0 0

For Enlargement of Board School, Eglinton Road, Plumstead, by 402 places. Mr. T. J. BAILEY, Architect.

		If Brickwork in Cement, add
J. Derry	£3,138 0 0	£50 0 0
W. Downs *	2,830 0 0	45 0 0
Holloway Bros.	2,786 0 0	60 0 0
James Smith & Son	2,995 0 0	65 0 0
Lathey Bros.	2,965 0 0	63 0 0
W. H. Lorden & Son	2,768 0 0	60 0 0
F. J. Coxhead	2,687 0 0	50 0 0
W. Gregar & Son	2,596 0 0	40 0 0
Kirk & Randall	2,583 0 0	60 0 0
J. Willmott & Sons	2,543 10 0	60 0 0

* Subject to the continuation of the present rates of wages and hours of labour.

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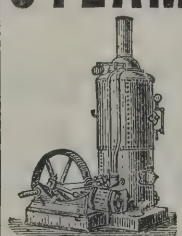
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For Building Board School for 802 Children, Faunce Street, Kennington Park Road, and Schoolkeeper's House with Cookery Centre under. Mr. T. J. BAILEY, Architect.

		If Brickwork in Cement, add
Lathey Bros	£19,146 0 0	£298 0 0
S. W. Pattinson	18,379 0 0	150 0 0
W. H. Lorden & Son	18,374 0 0	281 0 0
T. Boyce	17,797 0 0	199 0 0
Killby & Gayford	17,537 0 0	210 0 0
Holloway Bros.	17,401 0 0	187 0 0
J. Tyerman	17,259 0 0	280 0 0
E. Lawrance & Sons	17,101 0 0	187 0 0
Hart Bros.	17,058 0 0	187 0 0
W. Downs *	16,823 0 0	93 10 0

* This contractor adds:—"Subject to the continuation of the present rates of wages and hours of labour." The committee presume that this reservation is only intended to apply until the contract is signed.

For Building Board School for 1,200 Children, Sayer Street, Walworth, and Schoolkeeper's House with a Room under for Technical Purposes. Mr. T. J. BAILEY, Architect.

		If Brickwork in Cement, add
J. T. Chappell	£20,262 0 0	£230 0 0
S. & W. Pattinson	19,915 0 0	240 0 0
Atherton & Latta	19,791 0 0	300 0 0
Foster & Dicksee	19,453 0 0	299 0 0
E. Lawrance & Sons	19,307 0 0	307 0 0
Holloway Bros.	19,066 0 0	312 0 0
Hart Bros.	18,728 0 0	283 0 0
J. W. Hobbs & Co., Limited	18,635 0 0	290 0 0
J. Bull, Sons & Co., Limited	18,611 0 0	298 0 0
W. Downs *	18,390 0 0	123 0 0
H. Lovatt	18,003 0 0	356 0 0

* Subject to the continuation of the present rate of wages and hours of labour.

For Alterations at the Burrage Arms Tavern, Plumstead Road, for Mr. Sadler. Mr. HENRY H. CHURCH, Architect, Woolwich.

Coombs	£250 0 0
H. L. Holloway	244 0 0
MULTON & WALLIS (*accepted*)	197 0 0

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For Providing and Fixing Heating Apparatus, on the Low-pressure Hot-water System, for the Enlargement of Board School, Wilton Road, Dalston, now erecting.

R. Crane	£437 0 0
W. G. Cannon	425 0 0
Rosser & Russell	345 0 0
Purcell & Nobbs	336 0 0
J. Wontner Smith, Gray & Co.	329 0 0

For Heating Apparatus, on the Low-pressure System, for Board School and Pupil Teachers' School erecting on Lavender Hill, Wandsworth.

J. G. Wagstaff	£970 0 0
Comyn Ching & Co.	920 0 0
Jones & Attwood	868 0 0
T. Potter & Sons, Limited	868 0 0
J. Smeaton, Son & Co.	837 0 0
J. & F. May	830 0 0

For Removing Iron Building from the Merton Road Site, Wandsworth, and for Re-erecting it on the Garratt Lane Site, Wandsworth, for the School Board.

Isaac Dixon & Co.	£238 12 0
Croggon & Co.	236 15 0
T. Cruwys	199 18 6

For Alterations at the Hamilton, Akerman Road, Brixton. Mr. W. CHUTTER, Surveyor.

Knight	£233 0 0
Stevens	227 0 0
HEFFER (*accepted*)	189 0 0

MAIDENHEAD.

For Alterations and Additions to The Woodlands, Birchett's Green, near Maidenhead, Berks, for Mr. Frederick Brewer. Mr. W. EVERSDEN, Architect.

H. B. OLDREY, Kilburn (*accepted*)	£2,100 0 0

MALVERN LINK.

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Highfield Road.

J. Butler, Worcester	£762 0 0
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Jones & Fitzmaurice, Birmingham	548 0 0
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For Construction of Earthenware and Iron Pipe Sewers, partly in Tunnel, for the Street Local Board, Somerset. Messrs. JOHN NEWTON & SONS, Engineers, 17 Cooper Street, Manchester.

Lloyd	£2,561 7 6
Facey	1,891 4 10
Ambrose	1,792 5 10
T. Huish	1,575 10 0
F. Huish	1,509 19 0
Perriss	1,497 0 0
MERRICK (*accepted*)	1,469 8 0

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For Lych Gate, Road-making, &c., at Lydeard Tregoze, near Swindon, for the Burial Board. Mr. W. H. READ, M.S.A., Architect, Swindon.

T. BARRETT, Swindon (*accepted*).

For Fencing, &c., at Lydeard Tregoze, near Swindon, for the Burial Board. Mr. W. H. READ, M.S.A., Architect, Swindon.

EDWARDS & BAYS, Swindon (*accepted*).

For Erecting Twenty Houses, Folkestone Road, Swindon. Mr. W. H. READ, M.S.A., Architect, Corn Exchange, Swindon.

E. COWLEY, Wroughton, near Swindon (*accepted*).

For New Shop Front, Victoria Road, Swindon. Mr. W. H. READ, M.S.A., Architect.

J. WILLIAMS, Swindon (*accepted*).

UPTON.

For Works at St. George's Stores, Upton, for Mr. H. Loader. Mr. FRED. A. ASHTON, Architect, Stratford.

Rebuilding Back Addition, £83.

Alterations and Decorations to House, £55.

Building Stable and Paving Yard, £175.

NORTH BROS. (*accepted*).

UPTON—*continued.*

For Erecting House and Shop in Gipsy Lane, Upton, for Mr. F. Walker. Mr. FRED. A. ASHTON, Architect, Stratford.

North Bros.	£814 0 0
Hearle & Farrow	798 0 0
F. Voller	620 0 0
Coulsell Bros.	593 0 0
W. Martin	513 0 0
BASKETT & ATKINS (*accepted*)	510 0 0

TAMWORTH.

For Building Stabling and Cottages for the Tamworth Town Council.

Keen & Son	£809 19 6

UFFCULME.

For Building School and Classrooms at Uffculme.

Goff, Kentisbeare	£630 0 0
H. Phillips, Exeter	627 0 0
J. HART, Hemyock (*accepted*)	475 10 0

WAKEFIELD.

For Construction of Main Pipe Sewers, Lofthouse Gate, for the Wakefield Union Rural Sanitary Authority. Mr. F. MASSIE, Surveyor, Tetley House, Kirkgate, Wakefield.

J. Balmforth, Elland	£573 10 0
G. Wilson, Wakefield	403 15 7
W. Doleman, Dewsbury	401 7 11
M. ARUNDEL, East Ardeley (*accepted*)	386 13 6

WALTHAMSTOW.

For Building Stables and a Cottage in Eden Road Yard, Walthamstow, for the Walthamstow Local Board. Mr. G. W. HOLMES, Surveyor, Town Hall, Walthamstow.

W. Watling, Walthamstow	£1,371 0 0
E. Fuller, Walthamstow	1,250 0 0
J. A. REED, Walthamstow (*accepted*)	1,209 0 0
Surveyor's estimate	1,215 0 0

WITTON.

For New Cemetery Works, Witton. Mr. J. HOLLAND, Architect, Castle Northwich.

	Chapels.	Boundary Walls.
Rylance & Sons, Northwich	£2,130 0 0	£1,014 10 0
W. Molyneux, Northwich	2,110 0 0	995 0 0
T. Leicester, Northwich	2,008 0 0	1,098 0 0
J. Hamilton, Altrincham	1,950 0 0	1,275 0 0
J. MATTHEWS, Nantwich (*accepted*)	1,775 10 0	1,135 0 0

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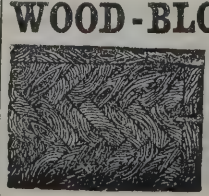
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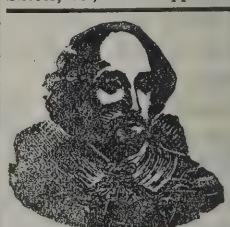
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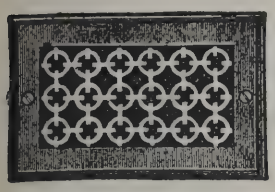
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PROOFS of this Illustration, which appeared in "The Architect" on June 6, 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each; post free, on roller, Ninepence.
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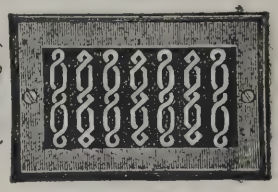
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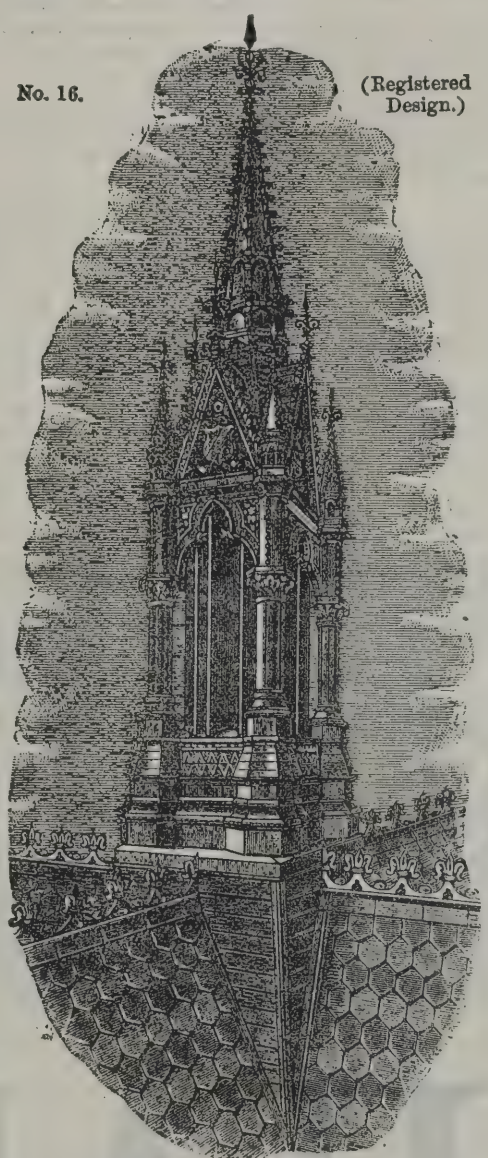


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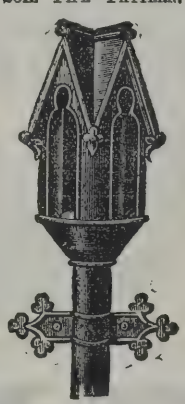
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„ 14 „	..... 5 to 7 „ ..	1	17	6	„ 24 „	..... 9 to 12 „ ..	5	5	0	„ 42 „	.....16 to 20 „ ..	11	17	6
„ 16 „	..... 6 to 8 „ ..	2	12	6	„ 27 „	.....12 to 14 „ ..	6	7	6	„ 48 „	.....18 to 24 „ ..	16	15	0
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TRADE NOTES.

THE new schools, Truro, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates and exhaust roof ventilators, the same being supplied by Mr. E. H. Shorland, of Manchester.

THE New Hall, Southampton, has just been completed from the designs and under the superintendence of Mr. Sidney Kelway Pope, M.S.A., who has given special study to the question of ventilation. Mr. Pope recognised the importance of having an efficient scheme, and after careful consideration entrusted the work to the Climax Ventilating Co., 15 Great George Street, Westminster, and has adopted their appliances with great success and satisfaction.

AMONG works being carried out by Messrs. Mark Fawcett & Co. are the following:—At Lincoln, where Messrs. Doughty, Son & Richardson are making extensive alterations to their linseed cake mills, the fireproof floors are being constructed by Mark Fawcett & Co. The fire-resisting qualities of this particular construction are so obvious and so generally recognised that, in consequence of its adoption in this building, the insurance company have consented to make a reduction from 2*l.* 2*s.* to 10*s.* 6*d.* in the premium. Another work, one of the largest undertakings probably at the present time, is the large block of flats now in course of construction on the site of the old Fisheries Exhibition, between the Albert Hall and the Imperial Institute. Some idea of the magnitude of the work can be obtained when it is mentioned that there are 16 acres of fireproof flooring in the mansions, which is being constructed on Fawcett's system. Also extensive alterations are being made at 4 and 5 Tokenhouse Yard, for the London and Westminster Bank, where the fireproof floors are being constructed on Fawcett's system.

THE well-known sanitary engineers, Messrs. J. Tylor & Sons, Limited, of 2 Newgate Street, London, E.C., have announced the issue of 250 five per cent. debentures of 100*l.* each, being the balance of an issue of 500, secured on the whole of the undertaking and property of the company. The capital of the company is 100,000*l.* in 10,000 10*l.* shares, of which 4,000 fully paid and 2,000 5*l.* paid shares have been issued. The company has also the power to issue 500 100*l.* mortgage debentures, bearing 5 per cent. interest, having a first charge on the undertaking and property of the company, and continuing subject to notice, and repayable as drawn, over 20 years, commencing in 1896. Of these debentures a second issue of 250 is now offered for subscription, to provide for the purchase of a freehold site of 2¼ acres (near King's Cross), and the erection of necessary buildings for a largely-increased factory. These debentures are only offered to customers and personal friends, and will be allotted in proportion to the amounts applied for. Applications to be made not later than July 29, 1891.

WITH reference to the invitation of the municipality of Sofia for tenders for the canalisation or drainage of Sofia, a complete set of the plans has now been received at the Foreign Office, and may be inspected there between the hours of eleven and five.

AT the meeting of the Birmingham School Board, attention was called to certain allegations made at a recent meeting of the Trades Council, to the effect that some of the Board's schools were being provided with "shoddy" furniture. It was asked if these allegations were true, and what had been done in the matter. Dr. Gardiner said that an expert in whom he had the greatest confidence assured him that for the price the Board had given the furniture was such as might be expected. The Board's mistake had been in accepting the lowest estimate. Mr. Jephcott said that the Cabinet-makers' Society, who were chiefly interested, would be content if they could learn that the Board were prepared for the future to have furniture worthy of the name. Mr. Kenrick said he quite agreed that all the furniture should be of a better character; and indeed the com-

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mittee at its last meeting resolved that the architects should obtain samples of furniture which, if approved, would serve as patterns. In the past the Board had been driven by the Department to cut down the expenditure on buildings (which included furniture), and rather than deprive the children of space by modifying the structures, they had thought it well to make the retrenchment on furniture; but happily the Department had of late taken a broader view, and he hoped the difficulty would not recur.

THE Town Council of Burton-on-Trent have decided to advertise for tenders for carrying out certain works of electric lighting in Wetmore Road, High Street and Station Street, lest powers might be given to an outside company to bring the electric light into the borough.

WORKS have commenced this week for the extension of the Shipley Local Board Waterworks. The head of the supply is 800 feet above sea-level, as compared with 700 feet and 750 feet, the highest altitudes in Shipley and Windhill respectively. The estimated cost is 10,000*l.*

THE local authorities have instructed the town clerk to communicate with a harbour engineer and request him to prepare the necessary plans and give a probable estimate of the cost of construction of a harbour at Macduff.

"FARMHOUSE and Country Lodgings in Essex, Hertfordshire, Cambridgeshire, Suffolk and Norfolk," a pamphlet issued by the Great Eastern Railway Company, will be useful to many during the holiday season. It contains nearly 1,000 names and addresses, with description of the houses, details of the districts, train service, &c.

IN Brookfield Church, Gorton, a new baptismal font has been dedicated. It is a memorial to the late Rev. George Henry Wells and the late Mr. Peacock, and is in keeping with the architecture of the building. The bowl and stem, which are of quatrefoil form, are executed in white Sicilian marble with red Devon shafts, and it stands on an octagonal platform of Bolton Wood stone, 5 feet 6 inches in diameter. Upon the rim of the bowl is carved the dedicatory inscription :—"In memoriam. George Henry Wells. Richard Peacock. Erected by the congregation, 1891." The font has been designed by Messrs. Worthington & Elgood, architects, and Messrs. Patteson, of Oxford Street, Manchester, have executed the work in a very satisfactory manner.

ON Wednesday, June 24, the members of the Civil and Mechanical Engineers' Society visited the Chemical and Creosoting Works of Messrs. Burt, Boulton & Haywood, at Silvertown. They were received by Mr. Holmes, the manager, Mr. Gabbett, the engineer, and Mr. Ashley, the works foreman, who showed and explained the operations by which coal tar was distilled and converted into valuable products. The most useful of these from an engineering point of view was the creosote, or oil of tar. In this department the new mixer, designed by the engineer of the works for incorporating heavy liquids and semi-solids, attracted attention. In the timber department was seen an ingenious combination of rollers and canals for transferring the logs from the ship's side to the timber ponds. The creosoting cylinders, about 7 feet diameter and 60 feet long, were inspected, and the method of stacking and creosoting sleepers and pile timbers was seen in progress. The party then, by permission of the Thames Iron Works, passed through their yards, and came to the works of the Stamped Steel Axle Box Company, at Orchard Place, Blackwall. Mr. Cavanagh, the secretary of the company, introduced the members to Mr. T. Donelly, managing director. The advantages claimed for stamped steel as against cast-iron are extra strength combined with elasticity and less weight.

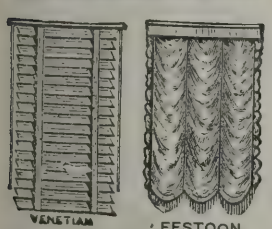
A COMPANY has been formed to acquire "The Tivoli" Theatre, Restaurant, &c., in the Strand.

AMERICAN NOTES.

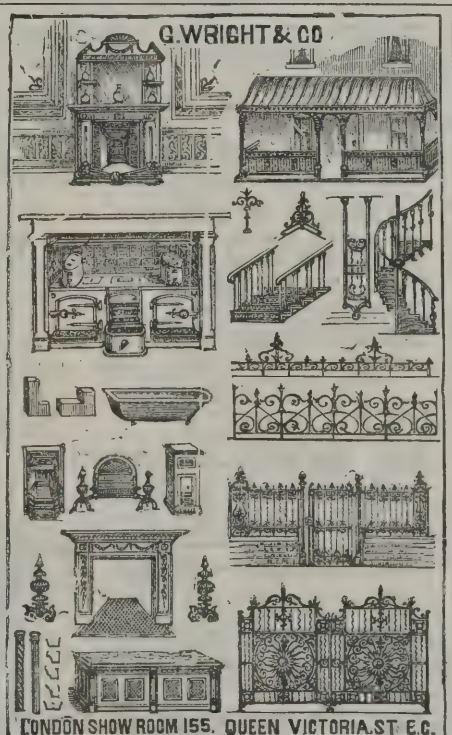
THE *American Manufacturer*, of Pittsburgh, says :—The temperature tests taken by Mr. Hallack, of the Government Geodetic Surveying Corps, in the well of the Wheeling Developing Company located at Boggs' Run, just below the city, although not yet completed, have embraced a sufficiently wide range of conditions to give approximately correct results. The well is now down to a depth of 4,500 feet, and is the second deepest well in the world, the only deeper one being at Schladelbach, near Leipsig, Germany, which penetrated the earth to a depth of 5,740 feet. It was primarily for a salt well, but having attained an extreme depth the Government took the well in hand and continued it for scientific purposes. The temperature tests at the Boggs' Run well are taken twice a day, at 9 A.M. and 5 P.M. Reports from the different points in the well are secured at once by suspending three buckets, each 500 feet from the one next to it, in the well at one time. Each bucket is of copper, about 20 inches deep, filled with water, in which two maximum thermometers are suspended. The

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buckets fit snugly to the sides of the hole, which is 4⅞ inches in diameter. The buckets are allowed to remain stationary for about twelve hours, and the heat from the surrounding strata in that time communicates itself through the buckets of water to the thermometers, where it is recorded. The highest temperature yet recorded is 110 deg. Fahr. at the bottom of the well, and the average increase of heat has been found to be about 1 degree for each 78 feet of descent.

AN illustration of the Coalbrookdale Bridge appears in the *Scientific American*, one of the most interesting bridges in England. It is located at Coalbrookdale, and is the oldest cast-iron bridge in the world. It was erected by Mr. Darby, the quondam owner of the Coalbrookdale Ironworks. It was erected in 1779. It reaches across the Severn with a span of 100 feet, while it has a total rise of 40 feet.

IN Sonoma county, California, may be seen a peculiar piece of engineering, namely, an actual railway bed on tree tops. Between the Clipper Mills and Stuart Point, where the road crosses a deep ravine, the trees are sawn off on a level with the surrounding hills and the timbers and ties laid on the stumps. In the centre of the ravine two huge redwood trees, side by side, form a substantial support. These giants have been lopped off 75 feet above the bed of the creek. This natural tree bridge is considered one of the wonders of the Golden State, and for safety and security is stated to far exceed a bridge built on the most scientific principles.

BUILDING AND BUILDERS.

WARRANT for the reconstruction of St. Cuthbert's parish church, Edinburgh, has been granted by the Dean of Guild Court. Mr. Hippolyte J. Blanc explained the special means proposed to be adopted to secure the comfort of the congregation in the matter of fresh-air supply and vitiated air outlets, and also in the arrangement of staircases and exit doors, heating apparatus, &c.

THE extension of the Warrington Infirmary has been commenced by Messrs. Gibson & Sons, contractors. A separate building will be erected on a plot of land in the gardens purchased from the Corporation, and outside the land owned by the Infirmary trustees. The plans have been prepared by Mr. W. Owen, architect.

PLANS are being prepared by Mr. C. J. Ferguson, architect, for a new workhouse chapel for the Carlisle Board of Guardians.

AN order of the Local Government Board sanctioning the scheme proposed by the Corporation of Salford under the Housing of the Working Classes Act, 1890, on Tuesday, the 7th inst., came before a Committee of the House of Commons in the form of a confirmatory Bill. The order relates to five unsanitary areas condemned by the local authority, and the estimated cost of purchasing the property, laying out new streets and erecting dwelling-houses for the working classes is 63,370*l.*, and the Bill was passed for third reading.

THE scheme for the erection of Market Buildings and a Corn Exchange was discussed at length at the meeting of the Gainsborough Board of Health. Some of the members advocated setting back the building to widen Flag Lane, and give the building a more uniform aspect. The architects informed the Board that to set back 3 feet at the widest part of the building would effect a great saving in regard to the main cost. The Board, by a majority, declined to sanction the loss of covered market space that would be thus involved, and the building will be erected to the utmost limit of space.

NEW municipal buildings erected near the old Guildhall at York have been opened. They provide offices for the departments of the town clerk, the city surveyor, and the city accountant, together with a council-chamber and various anterooms. The estimated cost of the building, including furniture and site, is 16,000*l.* The building has been erected by Messrs. Lowe & Sons, of Burton-on-Trent.

THE Local Government Board have sanctioned a loan of 3,000*l.* for the erection of the Oswestry Municipal Buildings.

AN inquest has been held at Windhill, Yorks, concerning the death of John McLaughlin, who died as the result of injuries received in the fall of a scaffold at Windhill. John Dovenor, the foreman at the buildings, stated that the broken piece of wood was beyond the usual strength of such erections. He thought the workmen must have let the stone fall, or the "needle" would not have broken. A witness who was on the scaffold swore positively that the stone was not allowed to fall. The jury returned a verdict of death from "shock" resulting from injuries accidentally received.

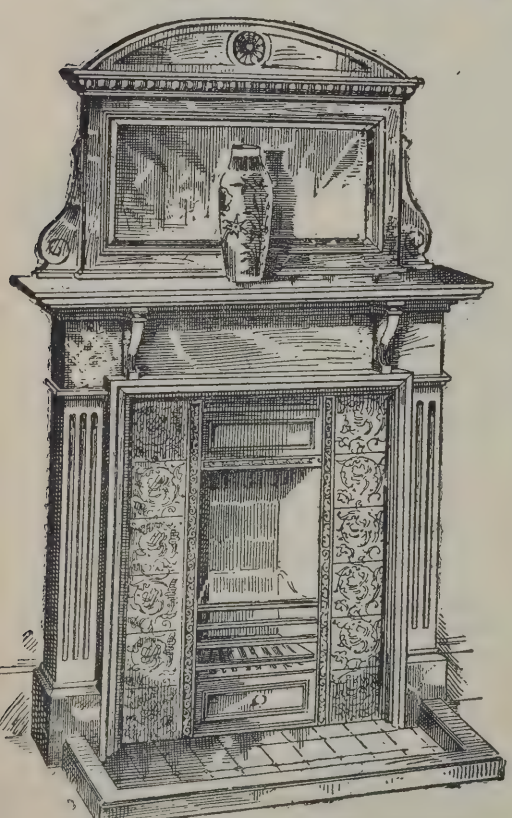
THE new head-quarters of the 2nd W. Y. V. Royal Engineers, Leeds, was formerly opened on the 4th. The buildings comprise accommodation for the officers, non-commissioned officers and sappers, with a grand entrance parade, armoury, armourer's shop, clothing store, the commissioned officers' committee-room, band-room and music

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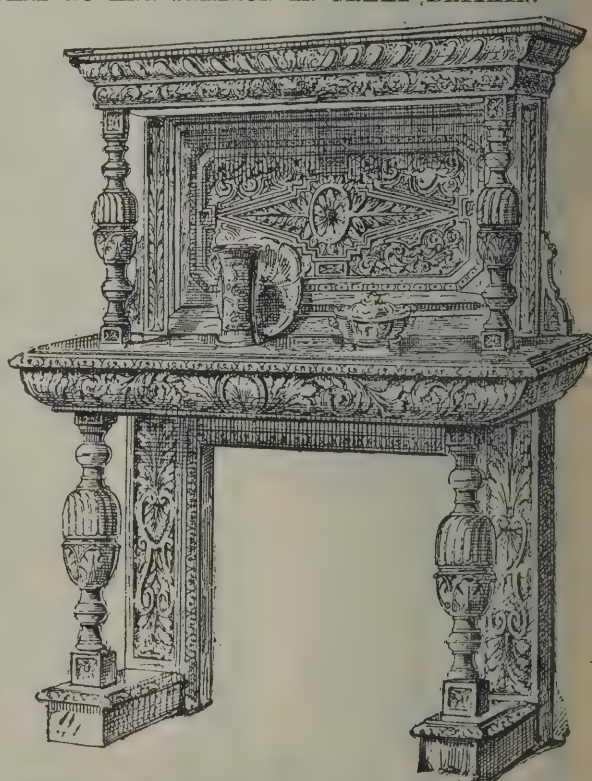
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store, old clothing store, commanding officer's-room, adjutant's office, magazine and caretaker's quarters. The design has been prepared and carried out under the supervision of Mr. William Bakewell, architect (an ex-officer of the corps). Mr. Joseph Pullan is the contractor, and Mr. Charles Goulden has acted as the clerk of the works.

VARIETIES.

IN accordance with the provisions of the Warrington Borough Extension, Water and Improvement Act passed last year, the waterworks undertaking has now become vested in the Corporation. The cost of purchase is over 250,000*l.*

THE *Bolton Chronicle* says:—The extension of the Swan Hotel and the pulling down of the block of old property adjoining has led to the discovery of a number of old relics, but the most important so far is that made in one of the passages of the hostelry, and which led to the drawing-room. It is an old stone window, bearing the date 1637, and was found built up with brick and covered with plaster, the structure being apparently too heavy to be removed at the time an extension was made. From the position of the window and its surroundings it is evident that the Swan Hotel in the time of Charles I. must have stood quite twelve yards back from the present front, and had probably a courtyard extending to the old roadway, beyond which an excellent view of the country could be obtained. Old coins have been found during the excavations, and also a secret passage from one of the upper rooms.

IN the Holiday Fashion Number of *The Gentlewoman* is found—for the first time in a ladies' journal—a complete set of fashions for costumes for every purpose required during the holidays. There is also a story by Walter Besant and one by Nathalie, ex-Queen of Servia.

WE record with regret, the *Aberdeen Press* says, the death of Mr. James Keith, secretary and cashier at the granite works of Messrs. A. Macdonald & Co., Limited, Constitution Street, which occurred on Saturday morning, the 4th inst. Mr. Keith, who was about seventy-five years of age, has been in the employment of the company over forty-six years.

THE death is announced of Mr. Gibson Watt, whose mother was a granddaughter of James Watt. Mr. Gibson Watt assumed by letters patent the name of Watt in addition to his paternal name, under the will of his great-uncle, from whom he inherited the property of the Watt family, including the Heathfield estate and the mansion of Heathfield, Handsworth, Staffordshire (now occupied by Mr. George Tangye), where the famous private workroom of the great James Watt is carefully preserved, with all his tools, &c., just as he left it.

THE Mayor of Sheffield, Mr. Samuel Osborn, died on the 7th inst. at Blackpool, where he had been staying for the benefit of his health. He was head of the firm of Samuel Osborn & Co., Clyde Steel and Iron Works. He was master cutler in 1873, in which year, owing to unexpected difficulties, Mr. Osborn was compelled to suspend payment, with heavy liabilities. Mr. Osborn bought back the business by paying a composition of 12*s.* in the pound, and within ten years of his failure he was able to send cheques to all his creditors in full discharge of the debts owing by him when he became bankrupt.

PLANS are to be prepared for the immediate extension of the East and New Croydon railway stations of the London and Brighton Railway Company.

THE ironmasters of South Staffordshire have resolved to invite the Iron and Steel Institute to hold their annual meeting in Birmingham. The date of the gathering will be September.

APPLICATION has been made by the Huyton-with-Roby Local Board to the Local Government Board for sanction to borrow 3,000*l.* for the erection of public offices.

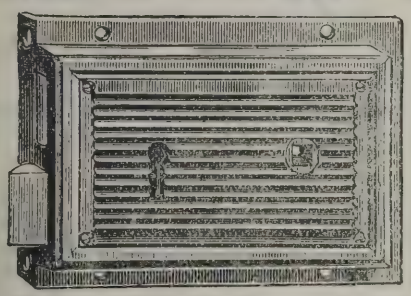
AT the meeting of the Dublin Corporation it was decided to obtain the opinion of expert consulting engineers on the question of the main drainage.

THE Bill promoted by the Salford Corporation to empower them to borrow an additional sum of 134,000*l.* for the purposes of the gasworks, 18,000*l.* on account of the waterworks and 50,000*l.* for drainage and sewerage has been reported for third reading.

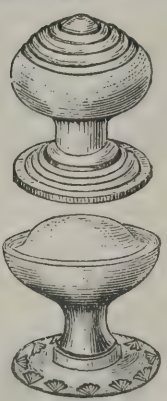
THE Baths Committee of the Aston Local Board, with a view of reducing the cost of the proposed public baths, suggest modifications which will effect a saving of about 1,000*l.* They have conferred with Mr. Stephens, builder, and recommend the acceptance of his tender at the price of 13,059*l.*, subject to the deductions. A sum of 3,341*l.* is provided in the contract for engineering works, though the committee propose to deal with this portion of the works by separate contracts.

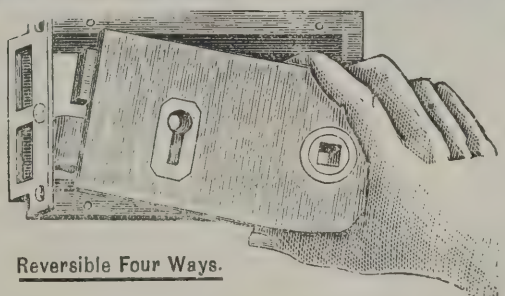
A LANDSLIP has occurred in the centre of Bilston, causing the destruction of a number of buildings, and threatening serious damage to the premises of the Great Western Railway, which

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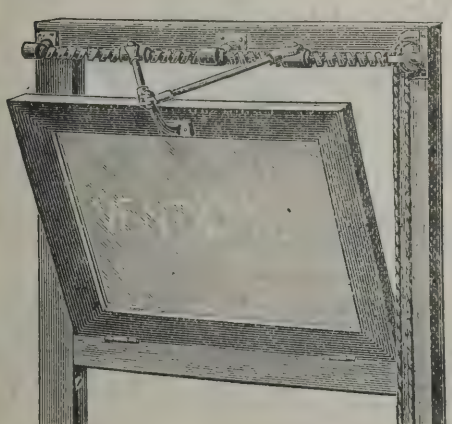


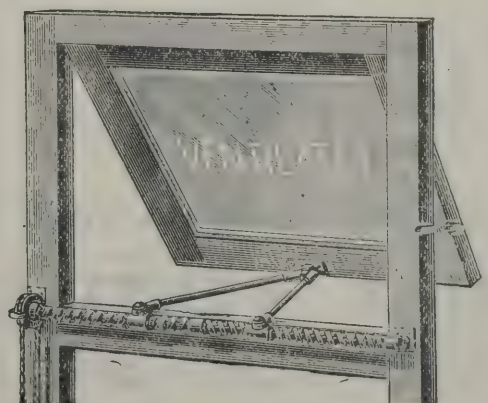
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runs near the scene of the principal damage. The settlement is believed to be caused by mining operations, the district being honeycombed by explorations in search of coal and ironstone.

"Hints on Sanitary Fittings and their Application" is the title of a little sixpenny book, written by Mr. R. M. Wharam and published by Messrs. H. & W. Brown, of Fulham Road. Mr. Wharam's practical acquaintance with the subject enables him to speak with authority, that the book will prove a useful guide now the majority of the public are so much engaged in setting their houses in order in respect of sanitary arrangements.

The Manchester Society of Architects has just been registered with limited liability without the addition of "limited" to its name.

NEW CATALOGUES.

An illustrated price-list has been issued, under date May 1891, by Mr. George Gunton, Costessey, Norwich, of ornamental brick chimneys. The chimneys illustrated are accompanied by sectional drawings, which show the details interiorly of plan, bases, caps, &c., all being drawn to scale. Mr. Gunton has a reputation for turning out good work, while in the matter of design the samples of chimneys shown are an evidence that, even in the plainest descriptions, the once proverbial ugliness of chimneys gives place to what is ornamental, the constructive details in a marked way helping to produce the design. About thirty-four designs are given in the list, and they show exceedingly tasteful treatment in the way of designing moulded brick chimneys. They are manufactured in either red or white brick. It is hardly necessary to add, what is pretty well known already, that Mr. Gunton carries out ornamental brickwork to architects' design, while the illustrations are evidence of what may be done with such humble appendages of our houses by thoughtful treatment.

SUBWAY UNDER THE THAMES.

The water supply for Nunhead and district is obtained from Hampton, being pumped thence by the Southwark and Vauxhall Water Company through some fifteen miles of iron main and stored for distribution in the reservoir at Nunhead. The supply of water has had to be increased, and this has been done under Mr. J. W. Restler, the engineer to the water company, by laying a second main from Hampton to Nunhead. This involved the construction of an iron subway under the Thames just below Kingston Bridge, which subway has recently been completed. It is circular in section, 9 feet diameter, and is constructed of cast-iron plates 1 inch thick, and bolted together in segments forming rings 18 inches deep. The method employed in driving the tunnel and fixing the plates was similar to that adopted in the construction of the City and South London Electric Railway. An iron shield of slightly larger diameter than the subway itself was forced forwards into the clay by powerful hydraulic jacks for a distance of about 18 inches, sufficient to insert one ring of the cast-iron plates. These plates were then fixed and bolted together in position, and the shield again impelled forward as before. By these means the earth in the tunnel was taken out as nearly as possible to the precise dimensions of the iron rings to be inserted. In order, however, to make the work perfectly solid and secure a grouting of liquid cement was forced in behind and around the rings when finally fixed, thus filling up every possible fissure and crevice between the iron and the surrounding clay. The subway is 600 feet long under the river, and it has been completed in the remarkably short space of nine weeks. The whole length of the tunnel is in the London clay, and at one point the thickness between the top of the subway and the bed of the river is only 2 feet 6 inches. It is fortunate for the contractors that the water did not break in at this point, or they would have been considerably delayed in their operations. The cast-iron main of 42 inches diameter, which conveys the water from Hampton to Nunhead, is divided in the tunnel into two pipes of 31 inches diameter each. The work has been carried out by Messrs. John Aird & Sons as contractors.

FIRE-RESISTING FLOORING.

The term "fireproof" as applied to flooring has almost become obsolete among those who have studied and endeavoured to improve the fire-resisting conditions of our buildings. Iron itself is not fireproof; as a matter of fact, it is very combustible when divided into small particles, and thus it may increase the intensity of an extensive conflagration when melted. In every elementary lecture on metals, pyrophoric—that is, atomic—iron is shaken from an hermetically-sealed tube, to show its ignition by contact with atmospheric air. Now, reasoning from this experiment, it is obvious that we must protect the iron

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from becoming so heated that the air has sufficient access to its molecules to cause its own internal combustion. The running of iron under heat will first occur in cast metal, such as columns supporting the structural ironwork of large buildings. The writer of this article observed in Leeds a goods depôt belonging to the North-Eastern Railway, in which during a fire the cast-iron columns had run like melted lead, because the columns were not protected from the intense heat of the merchandise burning around them. This was a lesson not to be forgotten by architects connected with engineering work, and especially when dealing with depôts at large stations. Thus it happened that steps were taken to ascertain the best means of preventing the recurrence of such disasters, and the first full application of the results arrived at were shown in the goods station at City Road, Bradford. Certain experiments were made by Messrs. Dennett & Ingle, which conclusively proved that their concrete, 1½ inches thick, would not pass heat enough in eight hours to melt tinfoil. Therefore, by coating the columns of the City Road station depôt with 2 inches of this concrete, the architect was assured of the safety of the structure, so far as fire might affect the columns. There yet remained the wrought-iron girders to consider, for those would bend under intense heat, and, moreover, this work was designed with large spans—10 feet, as far as our memory serves. So not only was a fire-resisting material required, but one that would be stable and reliable under heavy loads. The course pursued was to use Dennett & Ingle's concrete for the flooring, and to encase the wrought-iron girders as well. This particular work has stood for something like fifteen years, and similar material has been used in other places and for other purposes. Engineers, who have sometimes the responsibility of advising architects in the construction of heavy works, may at times become conservative, and adhere to that work which they have found to stand the test of years and of heavy loads. Now, what we have found good in Messrs. Dennett & Ingle's concrete is that it is a non-conductor of heat, and that it can safely carry loads which are considerable on long spans, and therefore it is to be recommended for all works of magnitude or importance. We wish it to be understood that in these remarks, which refer especially to large structures, we do not depreciate the advantages of other fireproof floors, where small spans only are used, such as may suit dwelling-houses or small warehouses, which are entirely different in their requirements from the structures to which we have referred, and which require floors capable of supporting heavy loads.

REGISTRATION OF PLUMBERS.

THE District Council for Devon and Cornwall held its annual meeting in the Guildhall, Plymouth. In the unavoidable absence of the chairman (the Mayor of Plymouth), Mr. A. Groser presided. The secretary (Mr. T. N. Andrews) read a report, from which it appeared that two examinations had been held in the district during the year, and that the number of candidates who passed were 61 per cent. and 52 per cent. respectively. The Council had met eight times. The number of plumbers registered in the district was 35 masters and 54 operatives. A deputation from the Council had attended a large meeting at Penzance, and a local committee had been established there to carry out the registration system. The Council hoped that similar local committees would shortly be established at Exeter, Torquay, Truro, Barnstaple and Honiton. A special committee of the Council had drawn up by-laws for the district, which had been approved by the Plumbers' Company. Organisations for carrying out the national registration system were now completed in forty counties of England and Wales, and the system was also thoroughly organised in all the chief cities and towns of Scotland and Ireland. Upwards of 900 members of the organisation were acting on councils and boards of examiners in carrying out the system, and between 1,300 and 1,400 apprentices and operative plumbers attended the classes. During the past year about 1,500 plumbers had been added to the register, and in some districts they found that nearly all the plumbers had already registered. It was found that the general character of plumbing work in those places was improving, and that where registration had been most largely adopted the plumbing classes were best attended.

Mr. T. Brook, J.P., in distributing the certificates of registration granted by the Plumbers' Company to local master and operative plumbers, mentioned an instance where, through the carelessness of a plumber, the lives of 150 workpeople were endangered. He said it was for the possessors of those certificates to let it be their constant aim to act up to the knowledge they possessed and to never bring dishonour to the diploma or to the national registration scheme.

The Chairman said he regarded the movement with which most of those present were connected as being the practical application of the sanitary science of the country. No one concerned for the sanitary welfare of the people could fail to be interested in, and wish well to, the plumbers' registration system

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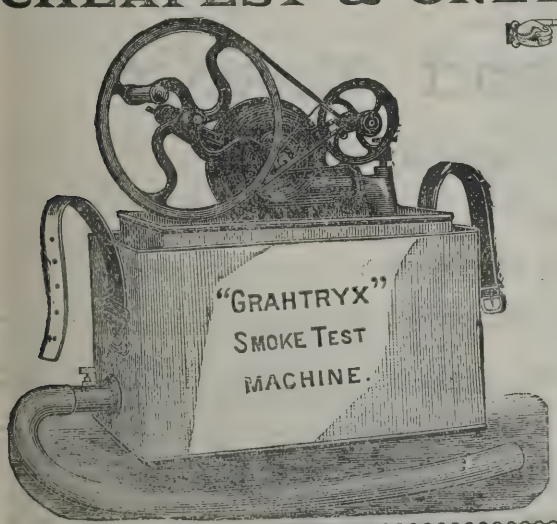
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and all that tended to its advantage. What they wanted was that those who were skilled and trusted in their profession should be able to be identified by the public as distinct from those who were not to be trusted, and who therefore were put on one side. It was not the work which cost least which was really the cheapest, and he hoped that those who had to employ plumbers and all other men connected with skilled trades would recognise that fact and not urge the acceptance of the lowest tenders, but look for the men who would do their work properly, and whose work, because best done, was certain to be the cheapest in the end.

ECKSTEIN *v.* THE ST. PANCRAS IRONWORKS COMPANY.

THIS was an action brought in the Chancery Division of the High Court of Justice for an injunction to restrain infringement of copyright in a trade catalogue issued by Messrs. Hayward Brothers & Eckstein, of Union Street, Borough, manufacturers of pavement lights, &c., against the St. Pancras Ironworks Company, of St. Pancras Road. Mr. Marten, Q.C., and Mr. Carpmael (instructed by Messrs. Wilsons, Bristow & Carpmael) appeared for the plaintiffs; Mr. Renshaw, Q.C., and Mr. Lawson (instructed by Messrs. Faithfull & Owen) appeared for the defendants. The hearing of the case occupied Mr. Justice Kekewich for four days, and his lordship, at the conclusion of the reply on behalf of the plaintiff, gave judgment on Tuesday last as follows:—

Mr. Justice Kekewich: In this case, as now and again happens, it falls to my lot to discharge at one and the same time the functions of judge and jury, and I have found it convenient on other occasions to follow the precedent set me by Sir George Jessel in similar circumstances, and, with a view to explaining to the parties the reasons for my conclusion, and to enable me, if so wishing or advised, to review that conclusion in the Court of Appeal, to direct myself; that is to say, to express by way of opinion such directions as a judge would give to a jury if there were a jury in the box, to which had to be submitted the question of fact. I should be obliged under such circumstances to lay down the law for the jury, and in saying that I of course put aside all questions arising on the title of the plaintiff to sue. Those questions have been deferred. They may or may not hereafter be argued, but I am not touching upon them in any wise. I am not concerned with them either as judge or jury. I assume for the present purpose that the plaintiff is entitled to sue; that is to say, that he is owner of the copyright in the publication in respect of which he sues the defendants. I think it is sufficient to limit that to the catalogue of 1889. If the plaintiff fails as regards the catalogue of 1889, it seems to me that he necessarily fails as regards all else, but I must not be understood therefore as excluding that of 1885, which has been referred to by Mr. Marten in his reply, and which is present to my mind.

Then assuming for the present purposes, and not at all deciding either one way or another that the plaintiff has a title to sue, first let me consider what the action is. It is an action to restrain the defendants from infringing the plaintiff's copyright on this catalogue; in other words, from copying their catalogue. Before proceeding further, it is necessary to consider in what that copying consists—that is to say, copying which is actionable copying. A catalogue is obviously a different publication from almost any other that is conceivable. It is different essentially from a publication such as is more common in actions of copyright and which occurs to one's mind more readily, such as a book—for instance, a novel. One might take many other instances equally well, but an ordinary novel will answer the purpose. The author of a novel written in the English language has no right to the words—that is to say, unless he invents words for his own purpose, and perhaps not even then; but he has no right to the words. The creation lies in the collocation of words which express situations, which express thoughts and sentiments, and the author has a right to have that collocation of words protected. It is easy, as a rule, to ascertain whether there has been any infringement of his right. You may in another work find the accidental combination of the same words in expressing the same idea. If you find that repeated; if you find the persons the same, even though they may be called by different names; if you find the situations similar, then you are driven irresistibly to the conclusion that there has been copying—and very little, in fact, determines one in the conclusion that where the collocation of words is the same there has been actionable copying, and for the reason which I have mentioned, that you are dealing with the creation of the mind, which is evidenced by what you have before you.

Another instance which sometimes occurs, and which may be referred to as distinguished from the novel, and more nearly approaching that which we have in hand, is the dictionary.

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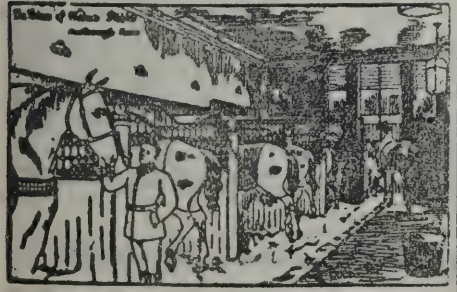
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There have been actions for infringement of copyright in dictionaries. I apprehend that a man who is proposing to compile a dictionary, whether in English or any other language, is entitled to the use of all the words in that language—that is to say, English; and he is entitled to place them in his dictionary in the order in which they naturally occur, according to the alphabet—that is to say, words beginning with *Ab* before those beginning with *Ac*, and so on. It would not be any ground of complaint by the author of an old dictionary that the new one followed that order, or that it contained all the words which were in his own dictionary. If the old dictionary is a good one, the new one will contain at any rate the same words: it may contain more. One looks further, and one finds the etymological explanations traced to different dead languages or compared with other living languages. Again, that may be identical in the two dictionaries. Again, if the old dictionary is really perfect, the new one must approach, in order to be good, very near to it. Then there is another matter with which we are all familiar in consulting dictionaries—the quotations. There you get a more doubtful ground; but it certainly is competent to the compiler of the new dictionary to quote Shakespeare or other well-known authors, and if he does he would probably quote some of the same passages which have been quoted before, and it renders the task of anyone who attacks a new dictionary as an infringement of copyright extremely difficult. What you have to do in a case of this kind is, as well as you can, to say, "Has the new dictionary maker industriously used the common materials, or has he slavishly followed the example of his predecessor?" He was entitled to consult his predecessor's dictionary, of course. He would have been wrong not to do so, but he was not entitled to copy. If you could come to the conclusion on identical pages that he had really by independent industry arrived at the same result, you would be wrong in holding him to infringe the copyright, notwithstanding the identity. The question is one of independent industry, but of course when you find line after line—still more when you find page after page—identical, what is in the first place suspicion tends to become, and probably will in the end become, conviction that that independent industry has been wanting. That seems to me a sort of middle case between the novel or other work of creation and the dictionary, which is more a work of industry.

Now we pass to such a case as a catalogue. The questions respecting catalogues always arise, and do arise in this instance, where the author of the catalogue complained of has carried on, or is proposing to carry on, a business precisely similar to that carried on by the author of the old catalogue. I put aside all patent rights. I put aside all rights arising out of registration of design or anything of that kind. Therefore the tradesman or the manufacturer has a perfect right to construct, make and vend the same article that his rival, already in possession of the field, has sold before him. He may make and sell not only a similar article, but an article precisely the same. He is, of course, not allowed to sell it as otherwise than his own. He must not hold out any idea that he is selling his rival's goods. But, again, that does not enter into the present case. As long as he does not do that, he may sell the very thing or so exactly a similar thing that no minute examination will find the slightest difference between them. He must depend on the excellence of his work and upon his *clientèle* for giving him the work rather than his rival. And if he may make, surely he may advertise it. He may advertise the very same thing. There is no reason, as he may sell an article precisely the same, why he should not describe it as being precisely the same. He may have actually line by line, and, if it comes to a question of figures and describing the contents, he may have the same figures and the same contents. If he passes from that and wishes to describe, of course he must take care about what I have called the collocation of words. The same thing may be aptly described in the same language, but when he comes to letterpress, he must be careful not to use the same words—certainly not the same words in the same collocation, unless he is ready to encounter the suspicion that he has been guilty of copying. But though he may, as I say, not only sell the same thing, but advertise the same thing for sale, he must not copy his rival's catalogue. He must arrive at the conclusion by independent industry, and the sole difficulty of course, in this case as in any other, as regards the patterns, is to decide whether the defendants here have arrived at the same or a similar result by independent industry or not. I have dwelt upon his liberty to make and sell the same thing, because that seems to me of first importance. Being at liberty to sell the thing, he has the thing from which he can make his patterns; that is to say, he has, or may have, the actual thing before him. If he has not already made it, he can probably find it in the market, or he can find some example of the article already sold, and from that he may take his pattern. In this particular case it is not proved thoroughly, but there is a suggestion—Mr. Marten, I thought, complained of it—that one of the objects delineated here was really one of the plaintiff's, and made by

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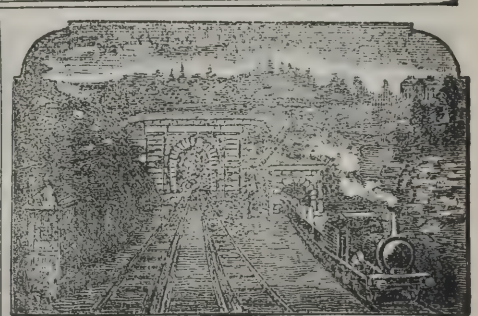
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the plaintiff, and, having been placed in Manchester, was copied by the defendants. I can see no possible harm in a rival trader, knowing that an article had been made, going to the place, copying it from the article itself, making and selling other examples of the article made exactly according to the pattern, and, having so got the pattern, reproducing it by means of a drawing in his catalogue. But he must not take his rival's catalogue and copy that. Then is he entitled to make any use of his rival's catalogue at all? I think he is. I think a manufacturer intending to issue a catalogue by way of advertisement is entitled to look at all the catalogues of all his rivals, and to consider what advantages they offer him, in what form they are to tempt the public, what their colours are, and so forth; and I see no objection to his determining to include in his catalogue some or all of these articles which he finds described in one or more of the other catalogues. But, again, having done that, and being at liberty to do that, he must not copy anything. He must use (I repeat the phrase) independent industry; and again, if you do find, on minute examination, such similarity—particularly if that similarity is repeated in several instances—as makes one suspicious that there has been copying, that suspicion may be readily increased into conviction, and the copying may be held to have occurred without proof, beyond that repetition of exact similarity that there has been a copying in fact.

Those are my views respecting the liberty of the rival intending to issue a catalogue. Having said so much about that, I do not propose to go at great length into the particular instances in this case, and I am dealing for the moment only with the patterns or pictures. As regards one about which much has been made, the sketch on the outside of the defendants' catalogue, I confess that I think now, as I thought when Mr. Garnham gave his evidence, that what he said put the plaintiff out of court. He was the first expert witness, as well as the only expert called by the plaintiff—a man called to show how precisely similar the defendants' pictures are to those of the plaintiff's; and he said, in terms which did not, to my mind, admit of any doubt, that he placed no reliance on that, on the question of similarity or dissimilarity. But that there might be no mistake about it, I called the plaintiff's counsel's attention to it on the spot and at once, but I really got nothing to contradict Mr. Garnham at all. But my own eye tells me that there are great differences between them, and that the differences seem to me to be in points of substance, whereas the similarities seem to me to be in points of less importance, always bearing in mind that this is an article which is common to the trade—that is to say, which can be made by the two, and therefore I think also described by the two. Therefore I put that aside.

Now one word before I go on as to the evidence, and this applies not only to the pictures, but to the rest of the case. I am not dealing here with any question of honest and dishonest witnesses, because if the question is to be discussed elsewhere it is right that the judges of the Court of Appeal should know how I regard the evidence. Mr. Eckstein is of course a deeply-interested witness. Mr. Pye Smith is the same, and so is, I think, Mr. Halford. I must regard him as interested as well. Therefore of course I treat the evidence of all those gentlemen with that care and drawback which is right whenever you are dealing with the evidence of an interested witness. But subject to that one remark, I think that I am bound to treat them all as desiring to give their evidence honestly, and to put their views and the facts within their knowledge before the Court fairly. There were some witnesses called on behalf of the plaintiff, a gentleman who came to tell us what the view of the trade was as regards these patterns. I do not pay much attention to that. Far be it from me to throw a doubt on their honesty of purpose or the straightforward character of their evidence, but they did not condescend to details. They took a particular view. They knew Haywards, they were not sympathetic with the defendants, and they regarded the defendants as intruders who were robbing the plaintiff of his established position, and their evidence was rather tinged by that kind of feeling towards him, and therefore their evidence is of less weight. As regards all the others I say it is not a case of disbelieving anyone, only weighing the evidence as well as one can.

That being so, what conclusion ought I to arrive at as regards the different patterns without going through every one of them? Now it seems to me, according to the evidence, that in every instance there was some material, at least, outside the plaintiff's catalogue. The plaintiff's catalogue was avowedly consulted, and according to my view the defendants had a right to consult it, but I do not think it was followed—that is to say, not beyond this, that the defendants intended to present to the public a catalogue illustrating and advertising articles of a similar character to those which the plaintiff had already advertised and was selling. I think that in every instance there were materials beyond that. How far Mr. Pye Smith, in making his sketches, had the plaintiff's catalogue before him, how far he drew it from his recollection of that catalogue, how

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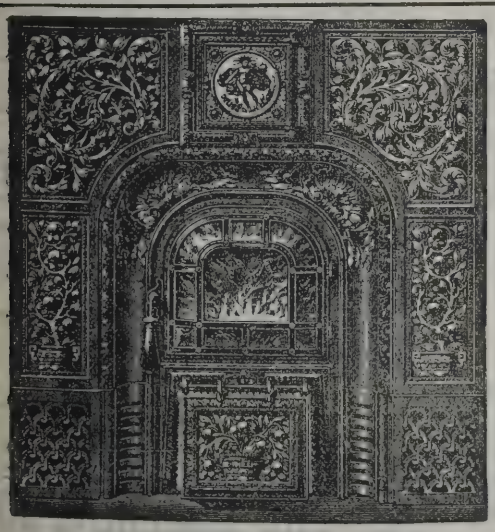
far he made those sketches from his recollection of the articles, or had the articles before him, it is difficult, perhaps impossible, to say. But I think where he made sketches there is not the slightest evidence to show that he copied the plaintiff's catalogue, and where he did not make sketches I do not think the evidence goes to show that instructions were given by him or by Mr. Halford directly from the plaintiff's catalogue. I think they were sufficiently independent to enable their draughtsman to draw quite independently of the plaintiff's catalogue. Then in many cases I know that there were either castings or wooden patterns or pieces of castings, something in a concrete form before them, and that they drew from them. On the whole, I think that the defendants acted fairly in that matter and endeavoured to make patterns which were their own, that they did exercise what I have already styled independent industry in the matter and to my mind they have done so with considerable success. I think when one comes to look into these things with the assistance of the evidence, it is not only possible but easy to see differences in every one of the patterns which are said to have been closely imitated. One, perhaps, on which more stress has been laid than any other, and which, therefore, I select for observation, is what is called No. 8, about which one witness made a complaint that it was No. 8. Of course, on that I do not dwell. No. 8 in the defendants' catalogue is to my eye, even without the evidence, very different from the No. 8 of the plaintiff's, and the same is in a less degree true of No. 10, which, with No. 8 and No. 9, makes a particular group. There there is more similarity, but it is only fair to observe that the pattern is of the simplest possible kind, and that there is very much less room for difference; but there is a difference, and when you come to compare them narrowly they are really not of the same sizes, the lines are different, and of course the surroundings are different. I say nothing about the words indicating the maker, because that I should not consider of the slightest importance either way.

As regards the rolling basement-lights there is certainly more difference than in the one, No. 10, to which I have just been alluding. One can see at a glance that there has been much introduced, and if you compare not only the rays of light but the wheels and the character of the wheels, without professing to enter into any question of mechanics, one sees that the artist here has introduced something entirely different. Then the only other one forming a separate group by itself is the cellar-flap. There there is a different point of view, as proved by the sketch which was handed up yesterday, and which, on the other hand, as Mr. Marten has pointed out, is not so different as at first sight appears. But there are there again very great differences, whether you look at the open cellar-flap or the shut one. It is sufficient to point out for the present purpose the glass, which is entirely different, in the one case being a flat and in the other case being a prism, and looked at in an entirely different way.

Now before I part with this there is one which I ought to refer to on an entirely different line, and that is the pavement-light which is made smooth for indoor use, but may be made rough, and it has been argued that a pattern in a catalogue, which is there represented to be rough sufficient to stand the wear and tear of outdoor use, may be copied by a similar one made smooth for indoors. If you could prove the fact of copying, that may or may not be so, but you must prove the fact of copying; and to my mind there is no proof here, and everything short of that goes to show that there has not been any infringement here of the plaintiff's rights. I ought perhaps to have mentioned that in passing on to No. 8 before going to the last one.

Then I pass on now to some matters which are not so much covered by my preliminary observations, and that is the letter-press made up really of the figures. I shall not say anything about the sections which I think follow what I have said about the patterns. As regards the figures there is some difficulty, and it is the part of the case which most impressed me in Mr. Marten's opening, and which has required more care than anything else. I leave out the superficial area, which is an introduction of the defendants' and which is not attempted to be complained of in any way. The plaintiff conceived the idea of grouping the patterns in a sort of schedule to each picture under heads of three or four, so as, I am told, to catch the eye; so that looking down for a moment under No. 15, "No. of lenses in length," 4, 5 and 6 are printed together, then there is a break, then 7, 8, 9 and another break, and then 10, 11 and 12. So that you have a grouping of nine things taken three together. That I think has been copied by the defendants, but I cannot see the slightest harm in their so doing. It is an idea. It is a mode of catching the public eye and so tempting the public attention, which does credit to the plaintiff in these days of advertising ingenuity. But why no one else should do the same I do not understand. If the plaintiff's case is sound at all as regards that, it follows that a man who desires to advertise, say, musical instruments, shall not group his violins or any other articles that he has to sell in that way—that the idea of group-

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ing them in little lots of three or four so as to catch the eye is the plaintiff's own property and cannot be copied by anyone else. I mean that if the plaintiff is right in that at all he is right not because the defendants are rivals in his own trade, but because he has a copyright in that grouping. To my mind it is quite impossible that he should have any such right, and I dismiss that.

Then come the figures. It matters not for this purpose which you take, but in each case there is, against the particular example which has a certain number of lenses in length, placed the length and height of the article having a certain number of lenses in height, and then going on varying and increasing the number of lenses in height along the row, so that you get a continuous multiplication of figures making the superficial area in each case. It is said that the defendants have copied that. I am not saying anything about the "stock sizes" or the right of the plaintiff to protect that at all. That is one of the questions of law which Mr. Renshaw has reserved, and which he may not have occasion to argue hereafter. I will assume that the plaintiffs, if they can show that there has been slavish copying in that, that is to say, that there has been no independent industry, can protect their description. Have they shown a want of independent industry? Or, rather, to put it the converse way, have not the defendants shown that they have exercised independent ingenuity? I think they have. I think that they have shown that they did all that was necessary. They knew that the plaintiff had done this; they knew that other persons had done this, but of course it has not been proved, and it could not be proved really, that in every single case in all these hundreds of instances the calculation was exactly made, either by Mr. Pye Smith or by Mr. Halford or by any one else. But the evidence goes, to my mind, to show that with rare exceptions the calculation was exactly made, and I am by no means satisfied on the evidence that the calculation was not made in every instance. I do not think it has been proved to me that in any instance it was not made.

That brings me directly to the one case to which Mr. Halford refers in his affidavit, and which he was cross-examined upon to-day, and which Mr. Pye Smith also gave evidence upon. As regards some particular numbers, the defendants admittedly have taken what they called the arbitrary sizes of the plaintiff's. That applies particularly to No. 1 pattern on page 7 of the defendants' catalogue. It is said also to apply to 16, 17 and 18 in that pattern and elsewhere. The 16, 17 and 18 have no doubt been taken from the plaintiff's to this extent. They had not been common in the trade as far as catalogues were concerned before this. The plaintiff had been selling sizes 16, 17 and 18, and therefore they were introduced into this catalogue for the first time, except so far as the plaintiff had already introduced them. But we have it in evidence that these things were sold, and if they were sold there was no reason why they should not be catalogued and advertised, and therefore I fail to see any blame attaching to the defendants for having added them to their catalogues.

Then, again, as regards this, I think, on the evidence, there is some confusion from the use of the term "arbitrary sizes." It may be, and I do not say it is not the case, that what was said about the adoption of arbitrary sizes does not apply to 16, 17 and 18, as well as to some other items, particularly in No. 1 pattern. It may be so, though I am not by any means certain that it is so. Now, what is the meaning of the defendants adopting the arbitrary sizes of the plaintiff? I understand it to be this. The plaintiff has taken certain sizes—certain lengths and depths—and multiplied them together for the purpose of ascertaining the superficial area, and has not brought out the same result as would be brought out by the actual calculation made as it appears to have been made by the defendants, and yet the defendants have taken the same arbitrary sizes of the plaintiff. And why? Because they said, "It is known in the trade; we shall only introduce confusion to our own detriment, because nobody will have anything to say to us if we make ours a little larger when other makers make them smaller." The motive is, of course, not of the very highest character, but I do not understand that the defendants arrived at that conclusion without calculation. If I did I should think that in this particular instance there had been some copying. But I do not understand that at all. My construction of the evidence is that they looked into the matter and then adopted what was mathematically wrong to a small extent for the reason which I have mentioned; and that is what is meant by adopting the arbitrary sizes.

As I have already said, there is some confusion in the evidence on the point, and it may be that I have not thoroughly understood it; but even here, where there has been I think some departure from strictest rules which ought to govern persons under these circumstances, I do not think that there has been the want of a deliberate exercise of independent industry. If there has been copying in one sense of the word there has not been servile copying. There has not been copying without calculation—without a desire to see whether it is

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right or wrong—and I think I ought to say, though the event has not occurred to my mind, that if I found some slight copying of figures, a few inches here or there, in a catalogue of this kind, I should not be disposed to grant the plaintiff relief, provided that I was satisfied that on the whole independent industry had been honestly exercised. A case has been quoted to me to show that even the slightest copying would be sufficient to give the plaintiff a title to relief. I do not understand that case—Mr. Justice Chitty's decision I should rather say, because the point does not appear to have been mentioned in the Court of Appeal—as going so far as the plaintiff would wish to push it. I do not think, in a number of figures of this kind, that if it could be proved, as to my mind it has not been proved, that the defendants had taken here and there a few figures carelessly, having tested many others and having found that many others were right—if, for instance, their agent or clerk, who was instructed to test any particular point, had shirked his work and simply copied another catalogue, I should not think that that was enough to give the plaintiff a right to an injunction, if I thought that on the whole the catalogue was the result of independent industry. Without going further into it I think that that independent industry is shown. That a great deal of it is not only not copied but is absolutely novel one's eye tells one. What the merits of course of the two rival traders are I know not, and am not concerned with at all. But I think that notwithstanding that a very strong case was opened, full examination has shown that the plaintiffs were unduly alarmed, that there has been nothing here in the way of dishonesty, and that there being no dishonesty the Court cannot interfere. The result is that, without going into the questions of law, I find on the question of fact in favour of the defendants, and the usual result must follow.

Mr. Renshaw: My lord, the motion stood to come on with the trial. I ask that the costs of the action may include the costs of the motion.

Mr. Justice Kekewich: That is the action I advanced practically.

Mr. Renshaw: Yes. I see according to the endorsement on my brief the motion was to come on with the trial. I shall ask that the costs of motion be included.

Mr. Justice Kekewich: Yes; I think you will get them without more, Mr. Renshaw.

Mr. Renshaw: I think perhaps I should, but I thought I had better mention it. I do not know whether your lordship will allow the costs of the shorthand notes?

Mr. Justice Kekewich: I am afraid I cannot. You should have thought of that before.

Mr. Renshaw: We did not make an arrangement, but they have been a good deal of use.

Mr. Justice Kekewich: Perhaps they were wise—they saw clouds ahead.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

Applications for Patents.

10624. Donald Barns Morison, for "Improved machine or apparatus for grinding, polishing, brushing, planing, sawing, carving and the like."

10646. James Gregory, for "Improvements in fastenings for doors and the like."

10660. Dixon Provand, for "A new device for feeding fuel below the fire in grates, stoves and ranges."

10700. Ralph Evans, for "New or improved clip or holder for chimney mantel-boards."

10722. Walter Thomas Ramsden, for "Improvements in seasoning timber."

10844. Thomas Alfred Appleing, for "Improvements in apparatus for raising and transporting goods."

10869. Eugenio do Zuccato, for "An improved method of and apparatus for making stencils for use in the production of manifold copies of writings, drawings and the like."

10911. Hugh Hughes, for "Improvements in boat-holding, raising and lowering apparatus, applicable also for other purposes."

10904. Denham Whitehouse, for "Improvements in lever mechanism of locks and latches."

11002. Frederick Alfred Thyss, for "Improvements in baths."

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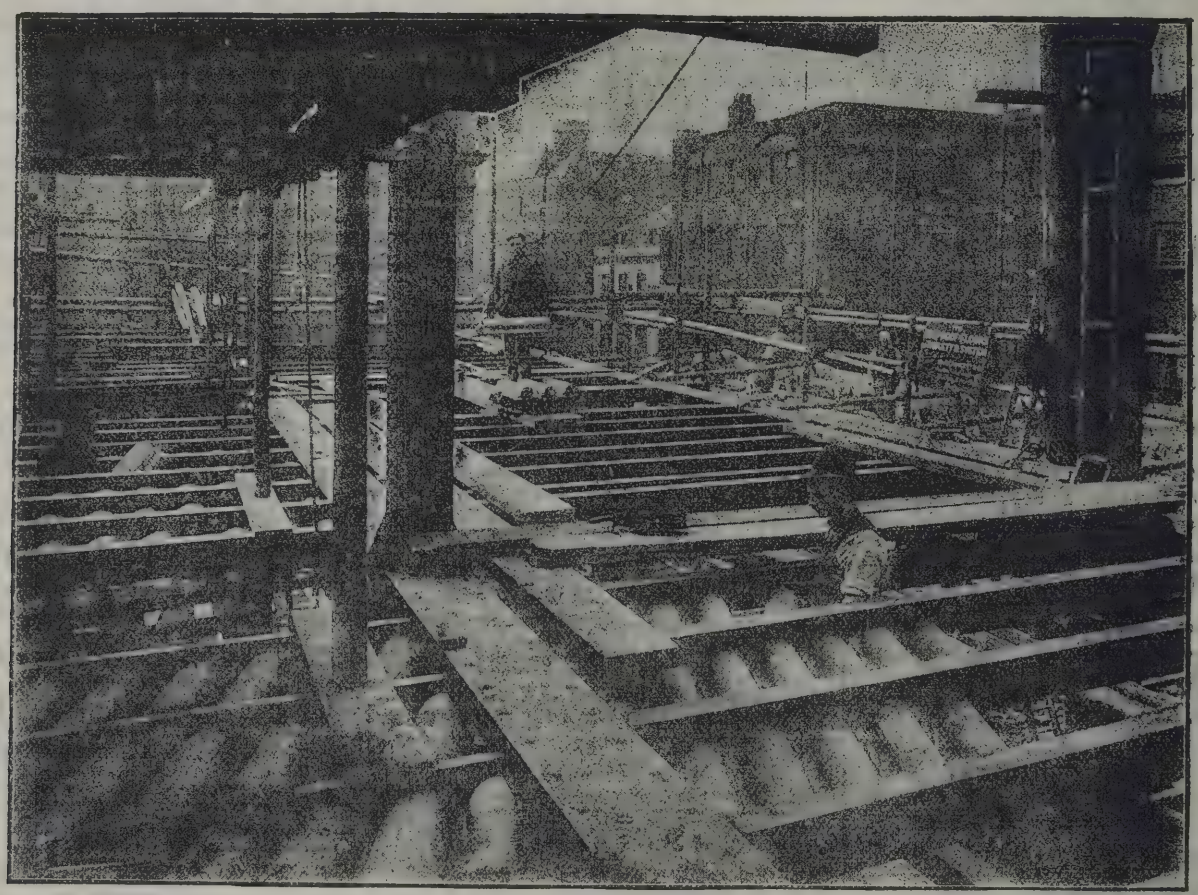
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Friday, July 10, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, JULY 17, 1891.

CONTRACTS OPEN.

ACTON.—July 28.—For Making-up-Roads. Mr. D. J. Ebbetts, Local Board Offices, Acton.

ALFRETON.—Aug. 3.—For Building Small Villa. Mr. William Watson, Victoria Buildings, Alfreton.

AVONMOUTH DOCK.—July 22.—For Erection of Police Station. Mr. F. E. Godwin, Surveyor, Heathville Road, Gloucester.

BATTERSEA.—July 27.—For Providing and Erecting Wrought-iron Gates and Railings. Mr. T. H. Bishop, St. Mary's Cemetery, Battersea, S.W.

BERMONDSEY.—July 20.—For Supply of Broken Guernsey Granite. Mr. J. Harrison, Town Hall, Spa Road, S.E.

BIRMINGHAM.—July 27.—For Erection of Pig Market, with Lodge, Offices, Water Bridge, &c. Mr. William S. Till, City Surveyor's Office, Birmingham.

BLACKPOOL.—July 20.—For Building Two Houses. Mr. W. Cardwell, Architect, Agnew Villas, Whitegate Lane, Blackpool.

BOLDON COLLIERY.—July 25.—For Building Miners' Hall. Mr. J. H. Morton, Architect, South Shields.

BOLTON.—July 20.—For Building Six-Storey Fireproof Mill and Warehouse, &c. Messrs. Bradshaw & Gass, Architects, 19 Silverwell Street, Bolton.

BRADFORD.—For Building Terrace of Houses. Messrs. Empsall & Clarkson, Architects, Tyrrel Chambers, Bradford.

BRAMLEY.—July 23.—For Extension of Weaving Shed, Wellington Mills. Messrs. John Kirk & Sons, Architects, Dewsbury.

BRISTOL.—July 23.—For Construction of Foundations, Retaining Walls, &c., for Electric Lighting Station. Mr. D. Travers Burges, 51 Prince's Street, Bristol.

BRIXTON.—July 24.—For Erection of Postmen's Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

BROMLEY.—July 21.—For Supply of Broken Granite, Rockstone and Flints. Mr. R. G. Mullen, Local Board Offices, Bromley, Kent.

CANTERBURY.—July 30.—For Supply of Broken Granite. Mr. W. N. Wightwick, Town Clerk, Canterbury.

CAPECASTLE.—For Building Limekilns. Mr. George Bradshaw, Railway Station, Ballymoney.

CARDIFF.—July 18.—For Building Baptist Chapel, Whitchurch. Mr. J. P. Jones, Architect, 27 Park Street, Cardiff.

CARDIFF.—July 20.—For Building Three Shops, Caerphilly. Messrs. Phillips & Holdgate, Architects, St. John's Chambers, Cardiff.

CARDIFF.—July 21.—For Extension of Ely Schools. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CARLISLE.—July 29.—For Additional Block of Piggeries at Asylum, Garlands. Mr. C. J. Ferguson, F.S.A., The Courts, Carlisle.

CASWELL BAY.—July 18.—For Building Cottage Residence. Mr. Henry Hall, Architect, 19 Doughty Street, Mecklenburg Square, W.C.

CHADWELL ST. MARY.—July 20.—For Erection of Board Schools. Mr. H. T. Bonner, Architect, 29 and 30 King Street, Cheapside, E.C.

CHAPELTOWN.—July 21.—For Shop and House. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

CHELSEA.—July 21.—For Cleaning and Decorating Council Chamber, &c. Mr. Thomas Holland, Town Hall, King's Road, Chelsea, S.W.

CHESTER.—July 18.—For Grand Stand, &c. Mr. T. A. Beckett, St. Werburgh's Chambers, Chester.

CROYDON.—July 21.—For Erecting Oak Park Fencing. Borough Engineer, 8 Katharine Street, Croydon.

DUBLIN.—July 22.—For Concreting (350 yards super) Floors at Workhouse. Mr. T. H. Atkinson, Clerk, Board Room, North Brunswick Street, Dublin.

EBBW VALE.—July 18.—For Waterworks Extension. Mr. T. J. Thomas, Engineer, Local Board Offices, Ebbw Vale.

GAINSBOROUGH.—Aug. 6.—For Building Market House, Corn Exchange, &c. Mr. D. G. Macdonald, Surveyor, Lord Street, Gainsborough.

GREAT NORTHERN RAILWAY.—July 23.—For Widening the Line between Stanningley and Wortley Junction. Mr. Wm. Latta, Secretary, King's Cross Station, London.

HALIFAX.—July 21.—For Building Church Institute and School. Messrs. Horsfall & Williams, Architects, Post Office Buildings, Halifax.

HARROW-ON-THE-HILL.—July 21.—For Additions to Wealdstone Schools. Messrs. Roumieu & Aitchison, 10 Lancaster Place, Strand, W.C.

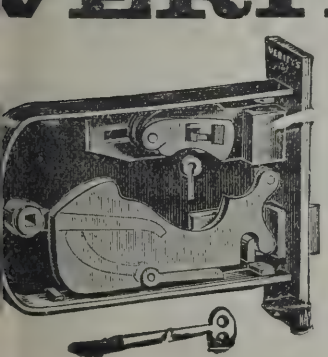
IPSWICH.—July 20.—For Building Twenty-four Houses. Mr. Frank Brown, Architect, Wimbourne House, Tower Street, Ipswich.

ISLINGTON.—July 20.—For Alterations, Repairs, Painting and Decorating at the Coroner's Court. Mr. Wm. F. Dewey, Vestry Hall, Upper Street, N.

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ISLINGTON.—July 24.—For Ventilation, Painting and Decorating Vestry Hall, and Construction of Strong Rooms. Mr. J. Patten Barber, Vestry Hall, Upper Street, Islington, N.

LAITHES.—For Constructing Bridge. Mr. Charles J. Ferguson, County Architect, The Courts, Carlisle.

LANCASTER.—July 17.—For Masons' Work. Mr. J. Parkinson, Architect, Castle Hill, Lancaster.

LEEDS.—July 18.—For Building Yorkshire College Hall of Residence. Messrs. Smith & Tweedale, Architects, 12 South Parade, Leeds.

LEEDS.—July 18.—For Building Four Terrace Houses, Beeston Hill. Mr. C. H. Thornton, Architect, 3 Park Row, Leeds.

LEWES.—Aug. 22.—For Supply of Broken Granite. Mr. Arthur Holt, Town Hall, Lewes.

LONDON.—July 21.—For Erection of Weights and Measures Office. Mr. H. De la Hooke, County Council Offices, Spring Gardens, S.W.

LONDON.—July 21.—For Erecting and Fitting-up new Laundry. Messrs. Wilson, Son & Aldwinckle, 2 East India Avenue, E.C.

LONDON.—July 21.—For Construction of Carriageways, Footways, Subway and Sewerage Works. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

LONG SUTTON.—July 21.—For Supply of Gravel and Broken Granite. Mr. Samuel S. Mossop, Local Board Offices, Long Sutton.

MOUNTAIN ASH.—July 24.—For Erection of Business Premises and Dwelling-houses. Secretary, Co-operative Society, Cwmbach, near Aberdare.

MOUNTAIN ASH.—July 24.—For Building Extensive Business Premises and Two Houses. Mr. M. Morgan, Maesyderwen, Mountain Ash.

NEW CROSS.—July 23.—For Formation of Paths, Levelling Ground, &c. Messrs. H. Jarvis & Son, Architects, 29 Trinity Square, Southwark, S.E.

NEWPORT.—July 28.—For Additions, &c., to Blackwood School. Mr. W. G. Griffiths, Architect, High Street, Newport, Mon.

NEW SWINDON.—For Building Hall, Reading and other Rooms. Mr. Brightwen Binyon, Architect, Ipswich.

PUDSEY.—July 21.—For Classrooms to Congregational School, Greenside. Mr. C. S. Nelson, Architect, 10 Park Row, Leeds.

RICHMOND.—Aug. 4.—For Erection of Municipal Buildings. Mr. W. J. Ancell, 3 Staple Inn, London.

SHEFFIELD.—July 27.—For Construction of an Inner Lining to Gasholder Tank. Mr. F. W. Stevenson, Sheffield Gas Co., Commercial Street, Sheffield.

SHOREDITCH.—July 21.—For Alterations and Additions to Stables. Mr. H. Mansfield Robinson, Town Hall, Old Street, E.C.

SHOREDITCH.—July 21.—For Alterations, Additions and Repairs to Gas-meter Testing Station. Mr. H. De la Hooke, County Council Offices, Spring Gardens, S.W.

SOUTHAMPTON.—July 18.—For Building Classroom, Lecture Theatre and Chemical Laboratory. Mr. W. B. G. Bennett, C.E., Municipal Buildings, High Street, Southampton.

SOWERBY BRIDGE.—July 21.—For Building Church Institute and School. Messrs. Horsfall & Williams, Architects, Post Office Buildings, Halifax.

STRATFORD.—July 31.—For Erecting Printing Works. Mr. T. D. Genlloud, Liverpool Street Station, E.C.

WATERFORD.—July 23.—For Works at Coast Guard Station, Helvick Head. Mr. W. B. Soadby, Secretary, Office of Public Works, Dublin.

WATFORD.—July 21.—For Erection of Recreation Hall. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

WESTMINSTER.—July 20.—For Building Public Library, Baths and Wash-houses. Mr. Francis J. Smith, 17B St. George Street, S.W.

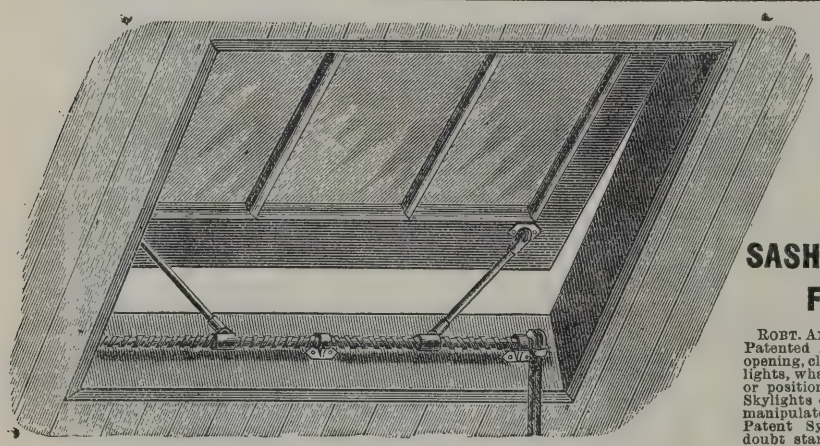
WORCESTER.—July 25.—For Laying Pipe Drains, Kerbing and Channelling. Mr. J. H. Garrett, County Hall, Worcester.

TENDERS.

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For Building Cottage, Stable and Farm Buildings, Bardon Pines, Blagdon, Paignton, for Mr. Percy Whitehead. Mr. W. M. TOLLIT, Architect, 10 High Street, Totnes.

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Vanstone, Paignton	942 0 0
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Rabbich & Brown, Paignton	818 0 0

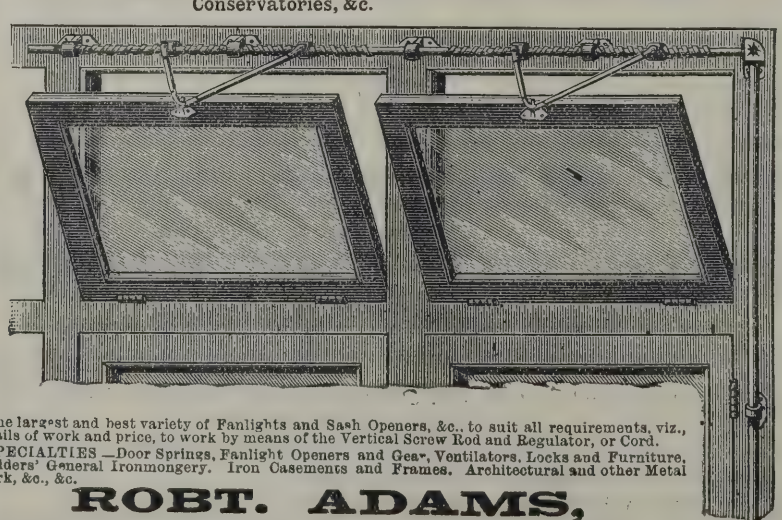


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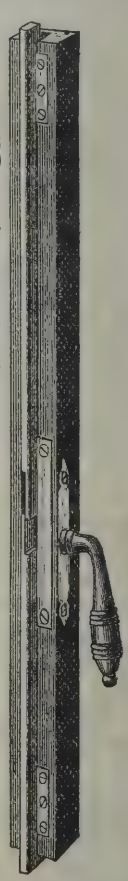
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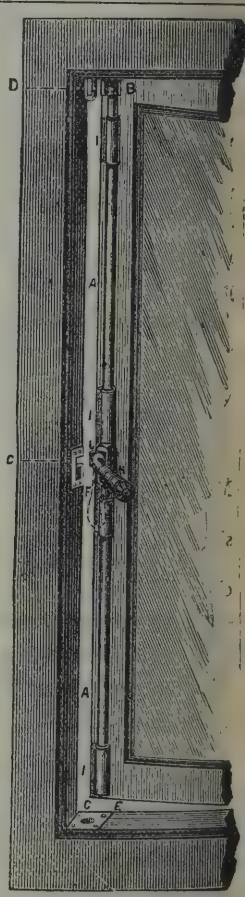
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J. Constable	214 9 0

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J. Richardson	158 0 0
F. Calvert	152 17 0

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For Construction of Second Reservoir, Bideford.

W. Gibson, Exeter	£6,406 0 0
R. Facey, Taunton *	6,277 0 0
Perrin & Long, Winchelsea, Sussex	4,733 0 0

* Or if the penal clause relating to completion in a certain time was modified, 5,927*l.*

BROCKWEIR.

For Building Moravian Sunday School, Brockweir, Gloucestershire. Messrs. FOSTER & LA TROBE, Architects, Bristol.

	Stone.	Brick.
Page & Selby, Brockweir	£525 13 0	£555 13 0
E. Walters, Bristol	475 10 0	514 10 0
W. Jones, Chepstow	475 0 0	475 0 0
G. HARRIS, Tidenham (*accepted*)	345 10 0	370 0 0

DEPTFORD.

For Re-erection of Two Recreation-rooms at Gore Farm Hospital, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street.

W. Johnson & Co., Limited	£900 0 0
KNIGHT, Sidcup (*accepted*)	729 0 0

BURNHAM.

For Alterations and Additions to National Schools, Burnham, Somerset. Mr. CHARLES S. LEECH, Architect, Boulevard, Weston-super-Mare, and Burnham, Som.

Chedzey Bros., Bridgwater	£349 0 0
J. Keats, Burnham	250 0 0
A. J. Dorey, Weston-super-Mare	218 17 0
H. Gibbs, Weston-super-Mare	200 0 0
G. RANDELL, Burnham (*accepted*)	185 10 0

For Building Villa Residence, also Coachhouse and Stables, Burnham, Somerset. Mr. CHARLES S. LEECH, Architect, 24 Victoria Street, Burnham, and Weston-super-Mare.

A. J. Dorey, Weston-super-Mare	£597 0 0
G. Randell, Burnham	554 0 0
J. Keats, Burnham	553 15 0
Gibbs & Co., Weston-super-Mare	546 0 0
A. Harding, Burnham	530 0 0

HIGHBRIDGE.

For Alterations to St. John's Schools, Highbridge, Somerset. Mr. CHARLES S. LEECH, Architect, Boulevard, Weston-super-Mare and Burnham, Somerset.

H. GIBBS, Weston-super-Mare (*accepted*).

HOVE

For Building Ward Block at the Hove Hospital, Portslade, for the Hove Commissioners. Mr. H. H. SCOTT, Town Surveyor, Architect.

R. Humphry & Sons, Hove (no sureties named)	£2,729 9 9
G. R. Lockyer, Brighton	2,662 0 0
C. & F. Cheesman, Brighton	2,440 0 0
Longley & Co., Crawley	2,382 0 0
J. Parsons & Son, Hove	2,300 0 0
W. Wallis, Balkam	2,292 0 0
N. W. Sawle, Worthing	2,224 0 0
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J. J. G. Saunders, Brighton	2,099 17 0
C. E. Kent, Brighton (no sureties named)	2,056 10 0

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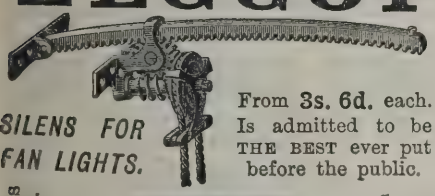
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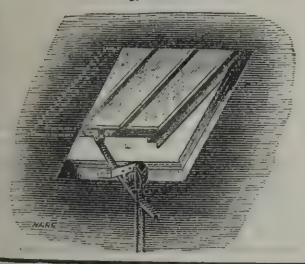
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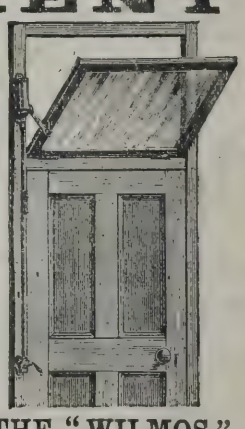
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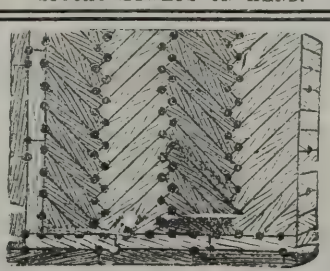
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For Building Board School, Kingswood, Wotton-under-Edge. Mr. WM. L. BERNARD, Architect, Bristol.

Stephens & Bastow, Bristol (credit for old materials £106)	£1,638	0	0
R. Fisher, Wotton-under-Edge (credit for old materials £300)	1,482	11	0
R. Williams & Sons, Bristol (credit for old materials £100)	1,408	5	2
W. Cowlin & Son, Bristol net	1,287	0	0
J. B. HUDSON, Yate (credit for old materials £175, *accepted*)	1,270	0	0
J. Roach & Sons, Charfield net	1,160	0	0

LEAVESDEN.

For Heating Coils to Two Drying Closets, at the Leavesden Asylum, near Watford, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street.

Potter & Son	£169	0	0
J. May	140	0	0
BRADFORD & Co., High Holborn (*accepted*)	127	10	0

LLANFECHAN.

For Building Residence for the Wesleyan Minister, Llanfechan. Mr. W. L. JONES, Architect, Bangor.

J. Pearson, Oswestry	£478	0	0
J. Williams, Trefynant, Ruabon	469	0	0
W. H. Thomas, Oswestry	469	0	0
I. JONES, Llanfechan (*accepted*)	468	0	0
E. Davies, Waterloo, Welshpool	394	0	0

LONDON.

For Painting, &c., at the Infirmary, Harrow Road, for the Guardians of Paddington. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street.

Hilder & Co.	£1,703	0	0
W. E. Jaques	957	12	0
Oetzmann & Co.	790	0	0
Akers & Co.	712	0	0
W. Dudley	585	15	0
G. Smith	530	0	0
GEO. FOXLEY, Regent Street (*accepted*)	355	0	0

LONDON—*continued.*

For Reinstating Warehouse at Tower Hill, for the Tip-Top Tea Company. Mr. H. H. COLLINS, Architect.

Harris & Wardrop	£3,300	0	0
Paramore	3,200	0	0
Mark	3,100	0	0
Patman & Fotheringham	2,978	0	0
Thompson	2,950	0	0
Outhwaite	2,900	0	0
Downs	2,841	0	0
Blow	2,780	0	0
Mowlem & Co.	2,768	0	0
Ward & Co.	2,694	0	0
Shepherd	2,585	0	0
Grover & Co.	2,480	0	0
W. Shurmur	2,367	0	0

For Rebuilding the Rose and Crown Beer-house, High Street, Lambeth, for the New London Brewery Co., Limited. Quantities supplied. Mr. W. M. BRUTTON, Architect, 1 Catherine Street, Strand.

Romaine & Co., Lambeth	£900	0	0
G. Ford, Lambeth	875	0	0
G. S. ARCHER, City Road (*accepted*)	789	0	0
B. Crook, Brixton	765	0	0

For Painting, &c., at the Infirmary, Cale Street, Chelsea, for the Guardians of Chelsea. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street.

F. G. Minter	£894	0	0
Rowe Bros.	748	0	0
G. Smith	650	0	0
W. F. Picken	550	0	0
Stewart & Co.	540	6	8
G. Foxley	488	0	0
G. Searle	485	0	0
J. Dorking	450	0	0
G. WADE, Chelsea (*accepted*)	425	0	0

For Alterations and Additions to the Rising Sun, Vauxhall Street, Lambeth. Mr. W. M. BRUTTON, Architect, 1 Catherine Street, Strand.

F. Hooper	£611	0	0
G. S. Archer	590	0	0
G. Ford	558	0	0
W. E. B. ROMAINE & Co. (*accepted*)	500	0	0

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MANSFIELD.

LONDON—*continued.*

For Building Block of Residential Flats, Oxford Street. Mr. H. H. COLLINS and Professor BANISTER FLETCHER, Joint Architects.

Whitaker	£14,644	0	0
Chappell	14,200	0	0
B. E. Nightingale	13,938	0	0
Brass & Son	13,920	0	0
Patman & Fotheringham	13,890	0	0
Lascelles & Co.	13,754	0	0
J. Grover & Son	13,640	0	0
Johnson & Co.	13,597	0	0
Bensley	13,554	0	0
Kilby & Gayford	13,500	0	0
W. Shurmur	13,446	0	0
Williams	13,407	0	0
Paramore	13,100	0	0
Grimwood	12,994	0	0
Perry & Co.	12,993	0	0
Allan & Son	12,300	0	0

For Building Premises at Rosebery Avenue. Messrs. T. CHATFEILD CLARKE & SONS, Architects.

C. Cox	£2,698	0	0
Holland & Hannen	2,610	0	0
Ashby & Horner	2,594	0	0
Colls & Son	2,582	0	0
Woodward & Co.	2,570	0	0
E. Lawrance & Son	2,511	0	0
E. Toms	2,418	0	0
W. Shurmur	2,394	0	0
W. Scrivener & Co.	2,392	0	0
Hall, Bedall & Co.	2,390	0	0
Ashby Bros.	2,387	0	0

For Rebuilding the Crown Public-house, Peckham. Messrs. WILSON, SON & ALDWINCKLE, Architects.

E. Harris	£5,460	0	0
Staines & Son	4,400	0	0
Balaam	4,254	0	0
E. Todd	4,129	0	0
W. Shurmur	4,020	0	0
J. & H. Mills	3,820	0	0

For Alteration to Gardeners' Arms, Coldharbour Lane. Mr. W. M. BRUTTON, Architect, 1 Catherine Street, Strand.

W. E. B. ROMAINE & Co. (*accepted*)	£119	10	0

LONDON—*continued.*

For New Female and Male Staff Blocks, additional Storey to Administrative Block, Nurses' Dressing-room, &c., at the Western Hospital, Seagrave Road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street. Quantities supplied.

B. E. Nightingale	£14,720	0	0
Rowe Bros.	13,200	0	0
Flew & Co.	12,670	0	0
W. Johnson & Co., Limited	12,547	0	0
H. M. Patrick	12,528	0	0
LESLIE & Co., Kensington Square, W. (*accepted*)	11,743	0	0

For Painting, Distempering, &c., at the Stepney Workhouse Infirmary, Bromley-by-Bow, for the Guardians of Stepney. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street.

Lilley	£319	0	0
Jaques	286	0	0
SHEPHERD, Stepney (*accepted*)	258	0	0

For Alterations to the Rose and Crown Public-house, Mare Street, Hackney. Mr. J. HAMILTON, Architect.

W. Harper	£1,300	0	0
W. Shurmur	1,296	0	0
S. Hayworth & Son	1,269	0	0
Godfrey & Son	1,134	0	0

PONTYPRIDD.

For Alterations and Building Factory, for the Pontypridd Coach Building Co., Limited. Mr. ARTHUR O. EVANS, Architect, Pontypridd. Quantities by Architect.

Johnson Bros., Cardiff	£2,039	19	6
G. E. Price, Cardiff	1,603	0	0
M. JULIAN, Pontypridd (*accepted*)	1,394	0	0
John Lubbock, Cadoxton (*received too late*)	1,304	0	0

PRINCETHORPE.

For Alterations and Additions to the Conventual Chapel, St. Mary's Priory. Mr. JOSEPH STANISLAUS HANSOM, Architect, South Kensington.

Accepted Tenders.

Claridge & Bloxham, Banbury, building work	£900	0	0
Jones & Willis, Birmingham and London, stalls, tribune, gallery, &c.	900	0	0
Bevington & Sons, London, improvement of organ	368	10	0

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For Alteration of Lavatories, Twenty-four New W.C.'s, Soil and Ventilating Pipes at Workhouse, from Plans and Specifications by Mr. S. SEGAR, Architect, Newton Abbot.

Bruford, Plymouth	£220 0 0
Helms, Torquay	176 0 0
Parker Bros., Newton	169 10 0
Burden, Teignmouth	168 10 0
Beynon, Torquay	166 0 0
Hall, Torquay	165 0 0
Collings & Hocking, Plymouth	155 0 0
Best, Newton	150 0 0
Mills, Newton	145 0 0
Mardon, Bovey Tracey	138 10 0

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For Improvements at Workmen's Institute, Spalding.

J. Stanger	£157 10 0
T. Pick	106 10 0
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C. A. WATSON (*accepted*)	90 0 0

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For Erection of One 20 horse-power Cornish Boiler, One 18 horse-power Horizontal Condensing Engine, and One Set of 9-inch Pumps. Mr. H. BROWN, Engineer, Tottenham.

J. Needham & Sons, Glasgow	£1,972 0 0
S. Owens & Co., London	1,950 0 0
Lilleshall Iron Co., Shropshire	1,895 0 0
Warner & Sons, London	1,734 0 0
White & Sons, Cowes	1,625 0 0
Bunyan, Potter & Day, Portsmouth	1,585 0 0
Calvert, Cornes & Harris, London	1,360 0 0
Marshall, Flemming & Jack, Motherwell	1,285 0 0
GIMSON & Co., Leicester (*accepted*)	1,228 0 0
Ellacott & Co., Plymouth	777 0 0

For Erection of an Engine and Boiler House, Coal Store and Chimney Shaft. Mr. H. BROWN, Engineer, Tottenham.

J. Linzell, London	£750 0 0
C. Gale, Cowes	673 0 0
W. Neil, London	652 0 0
W. J. THOMAS, Cowes (*accepted*)	647 17 0

WESTON-SUPER-MARE.

For Alterations and Additions to Hardelot House, Weston-super-Mare. Mr. CHARLES S. LEECH, Architect, Boulevard, Weston-super-Mare.

Gibbs & Solway, Weston-super-Mare	£305 0 0
A. J. Dorey, Weston-super-Mare	250 0 0
C. Taylor, Weston-super-Mare	229 0 0

VARIETIES.

IN the Cross-Country Railway Bill authorisation has been given for an iron viaduct, about as high as the clock tower at Westminster, to cross from the hilltop at one side to the hilltop on the other side of Monsal Dale—one of the most picturesque of the Derbyshire dales.

THE Leith Dock Commission propose the construction of a reclamation wall, a deep water wet dock, a dry dock and the deepening of the entrance channel, at an estimated cost of over 340,000*l.*

A FIRE has taken place which has resulted in the entire destruction of the Glenburne Hydropathic Establishment, the largest and finest institution of the kind in Scotland. The structure belongs to a limited liability company, and the damage is estimated at 50,000*l.* The directors have resolved to proceed at once with the rebuilding of the establishment as soon as the valuators have done their work.

THE death is announced of Mr. Barber Hopkinson, of Keighley, founder of the firm of Barber Hopkinson & Co., land surveyors, at Bridlington, where he had been staying for the benefit of his health, aged seventy-one years.

THE Continental Gallery in Bond Street is at present occupied by a collection of works by M. Jan Van Beers, an artist who has gained some notoriety, but who is amongst the most dexterous of modern painters. At the inaugural supper the gallery was illuminated by 575 incandescent lamps, fitted up by Messrs. C. Mellier & Co., art decorators, Margaret Street, Cavendish Square, who have obtained a reputation by the beauty of their work and the expedition with which it is accomplished. Mr. W. Lowry was the superintending engineer.

CANTERBURY is to have a new seaside suburb, and Whitstable, the town of "natives," a formidable rival, in the new building estate of Tankerton, which is now being rapidly bought up by builders who can recognise an eligible place when they see it. Further sales of building plots will be held during next month.

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ESTIMATES FOR ELECTRIC LIGHTING OR OTHER ELECTRIC WORK FREE OF CHARGE.

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TO ARCHITECTS AND BUILDERS.

Fountain Street, Bury, and Shiffnall Street, Bolton:
February 13, 1891.

Gentlemen,—We have pleasure in announcing that we have opened extensive Show Rooms at 117 QUEEN VICTORIA STREET, LONDON (opposite Civil Service Stores).

We have been very successful in Lighting and Ventilating Public Buildings in all parts of the Country.

We have a large stock of Sunlights, Turrets, Exhaust Roof Outlets, Tobin's Tubes, Air Grids, &c., &c. at our Show Rooms.

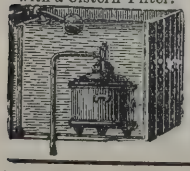
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A visit to our Show Rooms will be esteemed a favour. If inconvenient to call, send for one of our Illustrated Catalogues, inspect our Designs, and read our Testimonials.

Trusting to receive your favours, which shall have our prompt attention,
We remain, Gentlemen, yours obediently, **J. H. PICKUP & CO.**

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House Cistern, fitted with a Cistern Filter.



PATENT CISTERN FILTERS, Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. *Vide* Professor Frankland's Reports to the Registrar-General, July 1866; November 1867; and May 1870, The *Lancet*, January 12, 1867.
Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.
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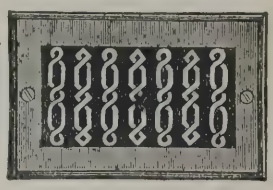
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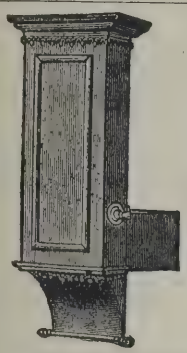
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JOHN GIBBS & SON.

CHEAPEST, STRONGEST, AND BEST VENTILATOR IN THE MARKET.

GIBBS' IMPROVED VERTICAL INLET.



No. 7 (Inlet). ORNAMENTAL BRACKET PATTERN.



No. 3 (Registered Design). GIBBS' PATENT WEATHERPROOF EXTRACTOR.

No. 16. (Registered Design.)



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No. 4 (Circular Front). STRONG GALVANISED BOARD SCHOOL PATTERN.

GOTHIC.

SOIL PIPE PATTERN.



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Extractor, 12 in. dia.			.....	4½ to 6 in. pipe..	£1	11	6	Extractor, 20 in. dia.			.....	8 to 10 in. pipe..	£3	17	0	Extractor, 36 in. dia.			.....14 to 18 in. pipe..	£9	15	0
„	14	„	.....	5 to 7 „ ..	1	17	6	„	24	„	.....	9 to 12 „ ..	5	5	0	„	42	„	.....16 to 20 „ ..	11	17	6
„	16	„	.....	6 to 8 „ ..	2	12	6	„	27	„	.....	12 to 14 „ ..	6	7	6	„	48	„	.....18 to 24 „ ..	16	15	0
„	18	„	.....	7 to 9 „ ..	3	5	0	„	30	„	.....	13 to 15 „ ..	7	10	0	„	54	„	.....20 to 27 „ ..	19	0	0

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C

THE Local Board of Holbeach, South Lincolnshire, have rejected a tender by the Gas Company to light the streets, and have decided to use oil lamps, as being more economical.

THE death has just taken place of Mr. M. D. Goodwin, J.P., and ex-provost of Motherwell. Mr. Goodwin was a member of the firm of Messrs. Goodwins, Jardine & Co., bridge builders and engineers. At the age of twenty-two he came to Motherwell, and entered into partnership with the late Mr. John Topping, the firm carrying on business as engineers and bridge builders under the name of Topping, Goodwin & Co. Shortly afterwards the amalgamation of the Motherwell works with those of Mr. Goodwin's brothers in Ardrossan altered the title of the firm to James Goodwin & Co., Mr. M. Goodwin acting as managing partner.

IN connection with the Aberdour-Inverkeithing water dispute, pending in the Sheriff Court, at Dunfermline, Sheriff Gillespie issued an order appointing the defendants (Inverkeithing Town Council) to lodge a minute stating whether they are willing to make arrangements with the North British Railway Company to have the effect of the flow of water to the company's tank at Inverkeithing upon the flow at the Aberdour meter tested by actual observation.

THE old and picturesque hostelry, the White Hart at Penkridge, a half-timbered building, has been well restored according to the opinion of archæological visitors. The hostelry is the property of Messrs. W. Butler & Co., Limited, and they have rebuilt the frontage of the house pretty much upon the old lines. Queen Elizabeth, in one of her royal progresses, stayed a night at the mansion.

A MEETING has been held to protest against the proposal of the West Derby Local Board to erect works in Rathbone Road for the destruction of the refuse of the whole township. It was stated that there was any quantity of land in the centre of Tuebrook on which the destructor could be erected, and the cartage to that ground would be cheaper than to any other point in the district.

THE Duchess of Albany has expressed her intention of being present on Saturday, July 25, to present the certificates awarded to ladies on a course of lectures on "Domestic Hygiene" at the Sanitary Institute.

THE Bangor City Council have been authorised to borrow 4,400*l.* for extension of their gasworks. At the monthly meeting an account was submitted showing that the profits on the gasworks in 1889 were 509*l.* 9*s.* 1*d.*, and the loss on the waterworks 310*l.* 16*s.* 11*d.* In 1890, the first year in which the reduction in the price of gas took effect, there was a loss of 484*l.* 6*s.* 3*d.* on the gasworks, and on the water 125*l.* 13*s.* 8*d.*, the loss on the former in 1891 being 435*l.* 8*s.* 2*d.* and on the latter 165*l.* 7*s.* The losses were reported to have been more than made up by the contributions from the rate.

AN inquiry has been held in the Mayoress's Parlour, St. Mary's Hall, Coventry, into the application of the City Council for sanction to borrow a loan of 14,000*l.* for the erection of new baths in Priory Street. Messrs. Spalding & Burgess, London, have prepared the plans.

IT was stated at the meeting of the Alloa Burgh Commissioners that the Water Bill, after a considerable amount of difficulty, had been safely passed by the Parliamentary Committee, and that forthwith 10,000*l.* would require to be paid to Lord Mar for the valuable rights he had signed over to the Commissioners. The total cost of the new supply to the town is roughly estimated at 50,000*l.*

A PRELIMINARY report of the proposed scheme for "social homes for young men" has been issued. It is hoped to provide rooms for those young men in the Metropolis, whose interests are being studied at an economical rate, while securing a sufficient return from the scheme to constitute it a sound commercial undertaking. At the same time the scheme has been devised to afford young men the advantages of a residential club, combined with the privacy and comfort of a home, including cheerful and comfortably-furnished private sitting-rooms and bedrooms, library, reading, writing and lecture-rooms, dining-rooms and recreation-rooms.

BUILDING AND BUILDERS.

A NEW Wesleyan church has been opened at Westbury Park, Bristol. The architect is Mr. H. D. Bryon, of College Green, Bristol. The design is after the Early Decorated style. The exterior walls are faced with hammer-dressed Pennant stone, with Coombe Down stone dressings, the roof being covered with purple Bangor slates, and the ridges will be finished with red terra-cotta cresting. The chancel has a rich glazed encaustic tile pavement, specially designed by the architect, and laid by the well-known firm of Maw & Co. The stone-carving was entrusted to Messrs. Davey & Bushell. Mr. T. R. Lewis was the contractor.

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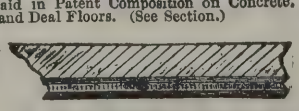
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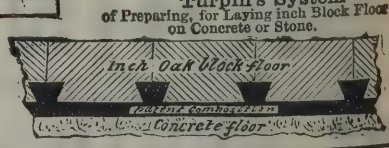


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of Preparing, for Laying inch Block Floor on Concrete or Stone.



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Plans have been passed by the Musselburgh Dean of Guild Court for the erection of a chapel at Loretto. The building, which will accommodate about 400 persons, is the gift of the old boys of Loretto. The cost will be about 3,000*l.* Mr. Honeyman, Glasgow, is the architect.

The foundation-stone of new workhouse buildings for the Grantham Union, which comprises upwards of fifty parishes in the counties of Lincoln and Leicester, has been laid. The site comprises 6½ acres, and with the buildings, when completed, will cost 25,000*l.* The contractors for the buildings are Messrs. Hodson & Son, of Nottingham. Mr. V. Green, of Grantham, is the architect. The buildings are to be in the "Pavilion" plan.

The erection of a new chancel to St. Andrew's Church, Wolverhampton, has begun. The contract for the work is in the hands of Mr. H. Lovatt, and the total cost is estimated at 2,800*l.*

It is proposed to build a new church at Gurnard, Isle of Wight. The cost, according to the plans prepared, is estimated to be about 1,200*l.*

The General Purposes Committee of the Bolton Corporation on Thursday evening approved of the recommendation of the Library Sub-committee that a library should be erected on land at the south-west corner, Town Hall Square, and plans with estimates relating to the project will be laid before the next meeting of the Library Committee. The committee's estimate of cost is 2,500*l.*, but, the *Bolton Chronicle* says, it is very questionable whether a building worthy of the borough and really adequate to its requirements can be put up for this sum.

The Walsall Board of Guardians have accepted the tender of Mr. Boden, of Wednesbury, for alterations and sanitary improvements at the workhouse for 759*l.* One of the guardians objected to the extension scheme, arguing that there had been a wasteful expenditure of money in the purchase of the land at the back, and that the better plan would be to erect another workhouse elsewhere, the present building being inconvenient and not in a suitable locality. The tender of Messrs. James Allan & Son, Glasgow, for the supply of the external staircase, for the sum of 193*l.*, was also accepted.

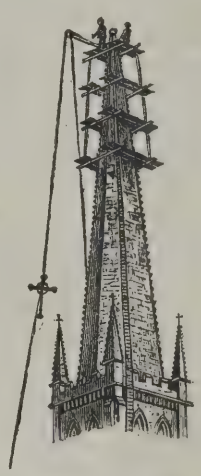
The foundation-stone of a public school at Leith, of which Mr. George Craig, of Leith, is the architect, has been laid. The total cost of the school is estimated at about 18,000*l.*, and among the contractors for the work are :—Builders, Messrs. A. & W. Fingzies ; slaters, Messrs. W. & S. Christie ; plumber and gasfitter, Mr. T. M'Pherson ; painters, Messrs. Haddon & Son—all of Leith ; with Messrs. W. & J. Watson, Edinburgh, in charge of the carpenter and joiner work.

A complimentary banquet has been given to Major W. V. Morgan, chairman and treasurer of the London Homœopathic Hospital, in recognition of his services to the institution. The Major was congratulated on obtaining 26,000*l.* for the rebuilding of the hospital on its present site, and a further amount of 4,000*l.*, necessary to make up the total of 30,000*l.* requisite for the new building, it was stated would be placed in his hands.

NEW CATALOGUE.

A new catalogue has been issued by the Midland Wire Cordage Company of the Orchard Works, Vincent Street, Balsall Heath, Birmingham. The question of protecting buildings from lighting has for long engaged the attention





of the company, and the works they have carried out have been to the complete satisfaction of their clients, all works being carried out by skilled workmen under their personal supervision. Mr. William H. Davison, the managing partner, is also consulting electrician.



MAW & CO., LIMITED, will forward on application Pattern Books or Special Designs, with Estimates for all kinds of Floor and Wall Tiling. Patterns can also be seen and particulars obtained at the Show-rooms of their appointed London Agents, Messrs. W. B. SIMPSON & SONS, 100 St. Martin's Lane, W.C.

AMERICAN NOTES.

ONE of the features proposed for the World's Fair at Chicago is a casino and pier. The casino, which will stand out in the lake 1,000 feet from the shore, is intended to reproduce Venice on a small scale in Lake Michigan, and has been designed by Messrs. Burling & Whitehouse, of Chicago. The building, which will comprise an area of 180 feet by 400 feet, will be built on piles, and connected with the shore by a pier 80 feet wide. It will consist of nine pavilions, two storeys in height, and, with the exception of the central one, 80 feet above the surface of the water. The centre pavilion will be 180 feet high. There will be communication between the nine pavilions both by gondolas and bridges. Surrounding the central pavilion will run a gallery 56 feet wide. The pier connecting the casino with the shore will form a broad promenade. In front of the casino will be a harbour for small pleasure craft; at night this harbour will be lighted by incandescent lamps sunk beneath the surface of the water on floats.

THE fine arts exhibit, it is now definitely and finally settled, will be at Jackson Park, the strong effort which was made to have it located in the Lake Front Park having been defeated in the Directory. The fine arts building, which will cost about 600,000 dols., will stand in the northern portion of the grounds, and will be nearly surrounded by the buildings of the several States of the Union.

A PERMANENT art palace will be built also in Lake Front Park, towards the erection of which the Exhibition will contribute 200,000 dols. During the Exposition this building will be used by the World's Congress Auxiliary for the holding of some of its numerous congresses. After the fair the Chicago Art Institute will take possession of it and make it the home of a permanent art collection.

COMMENTING on the failure of the railway bridge of the London, Brighton and South Coast Railway Company, the *Engineering News* of New York says:—American engineers, and Americans who could lay no claim to the title of engineer, have built some bridges in the past which deserved criticism, and received it, too. But as knowledge has increased, many errors have been rectified and great improvements have been made. Not all American railway bridges are what they should be by any means, but on our principal lines, at least, we believe that no bridge is kept in use without some sort of knowledge of its strength, and we doubt if there is a single bridge on an important American railway as treacherous as was this ill-designed cast-iron structure on one of the principal railways of England, the failure of which is remarkable chiefly because it did not occur many years ago.

TRADE NOTES.

UNDER the superintendence of Messrs. C. F. L. Horsfall & Son, architects, of Halifax, a handsome reredos has been erected in Warley Church, near Halifax, by Messrs. Jones & Willis, of Birmingham and London. The central panel is a spirited carving representing the Lord's Supper, the grouping being that of the famous fresco by Leonardo da Vinci. The figures are carved, in very high relief, in oak, of which wood the framework is also built. This consists of an elaborate canopy of seven arches, with crocketted gables above in the Early English style. A battlemented mould runs between the gables, the spandrils being filled with carving. The canopies are supported by columns at the end, flanked by buttresses terminating in crocketted pinnacles. The side wings form a framework for the Decalogue, Creed and Lord's Prayer, which are painted upon the wood, the panels being filled in with tracery of a simple character.

A DRAINAGE scheme has been proposed for Ayr, having for its object the concentrating of the sewage of the south side of the river in a single outlet, instead of its being deposited on the beach by seven outlets as at present. The work is estimated to cost about 8,000*l*. The proposal is to carry the sewage out to sea a quarter of a mile beyond the south pierhead. At present it is stated that there are 100 sewage outlets into the river on both sides between the mill-dam and the south pierhead.

A DESTRUCTIVE fire has taken place at the works of Messrs. C. Hindley & Sons, cabinetmakers, in Erskine Road, Regent's Park Road, N.W. Messrs. C. Hindley & Sons write that, notwithstanding the fire at their cabinet factories, their machine shops and stock of timber were saved, and work has already been resumed in temporary premises.

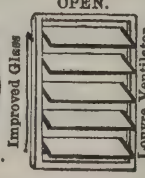
AT the meeting of the Walsall Town Council the General Purposes Committee reported that, having had under consideration the report of Mr. F. Brown, of the Walsall Electrical Company, on his recent inquiries in America as to the working of tramway lines there with electric motors, to be supplied with

H. W. COOPER & COMPANY, LIMITED.

HEALTH EXHIBITION.



MEDAL AWARDED, 1884.



Manufacturers of Cooper's Glass, Revolving, Circular, and Sliding Ventilators (H. W. Cooper, Sole Inventor).

Improved Glass Louvre and Venetian Ventilators, for Private and Public Buildings, Churches, Halls, and lights of every description. Improved Iron, Copper, Brass, and Gun-Metal Casements. New Hopper Ventilators for Skylights, &c. Medal awarded to H. W. Cooper from Glass Sellers' Company Exhibition, London, 1876. Diploma of Merit, Sanitary Institute of Great Britain Exhibition, Glasgow, 1883. Diploma of Merit, National Health Society Exhibition, London, 1883.

H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.



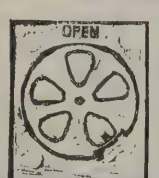
GLASS SELLERS' COMPANY EXHIBITION,



MEDAL AWARDED, 1876.

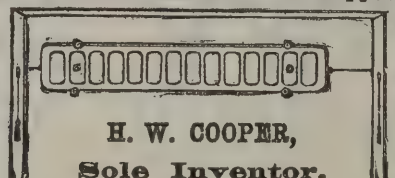


Improved Casement.



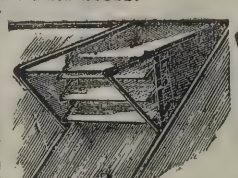
Circular Glass Revolving Ventilator.



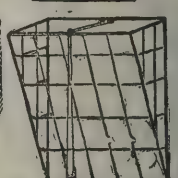


H. W. COOPER, Sole Inventor.

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electricity by means of overhead wires, they recommended that, subject to arrangements being made by the company to the satisfaction of the committee as to the terms and conditions upon which poles shall be placed in the public streets, and overhead wires shall be carried along and across such streets, and cars run on the tramways by electricity, the consent of the Council be given to the company working these lines by means of overhead wires, and that the committee be authorised to employ an electrician to advise them as to the conditions and terms to be imposed upon the company. Alderman Evans proposed the adoption of the recommendation, and stated that Mr. Brown was completely satisfied with what he saw in America, and the fact that town after town, to the extent of hundreds, had adopted the system. Mr. Powell seconded the proposition, giving particulars of the proposed arrangements, and the recommendation was agreed to.

ON August 6 Messrs. E. & H. Lumley will sell at St. Helen's Park Hotel, Hastings, a number of lots of valuable freehold building land in St. Helen's Park. It is not so many years since this part of Hastings was a tract of country made up of green fields, vales and hills; and the rapid conversion of the country-looking spot into a populous suburb with a charming park is evidence of the attractions the locality has for residents.

THE new schools, Warrington, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

WE are informed that Messrs. Chambers & Co. have removed from 41 Bishopsgate Street Without to extensive premises, No. 90 Worship Street, E.C., where they show a carefully-selected stock of stoves, ranges and mantelpieces, also builders' and general ironmongery of all descriptions.

AT the monthly meeting of the York City Council it was reported that Mr. Leonard Bottoms, the contractor of the new sewerage works under contract No. 2, had ceased operations and had paid off his workmen. Mr. Bottoms having broken his contract, the committee recommended the Council to accept the tender of Messrs. S. & E. Bentley, of Leicester, at the sum of 69,387*l.*, with certain small allowances. The committee had given notice to Mr. Bottoms and his sureties that the Corporation would hold them responsible for any loss which they might be put to in consequence of the works which Mr. Bottoms tendered for costing more than his contract price. Mr. Bottoms had served a writ upon the town clerk, claiming (1) damages for breach of his contract, (2) for 3,500*l.* for work and labour done and materials supplied, (3) an injunction. The town clerk had entered an appearance to the writ on behalf of the Corporation.

A REPORT of the Gas Committee of the Stafford Town Council has been adopted. It contained recommendations that contracts should be accepted as follows:—Railway weigh-bridge, Messrs. Pooley & Son, Liverpool, 112*l.*; river bridge, Messrs. Eastwood, Swingler & Co., Derby, 285*l.*; retort-house roof and lattice girder, Messrs. Rubery & Co., Darlaston, 269*l.*; telescoping gasholder, Messrs. W. R. Renshaw & Co., Stoke-on-Trent, 1,443*l.* 10*s.* The committee also recommended that tenders be obtained for the erection of brickwork and ironwork for new coal stores. The committee received thirteen tenders for telescoping the No. 3 gasholder, the tenders varying from about 1,500*l.* to 2,600*l.* Messrs. Renshaw & Co.'s was the lowest. The committee received twenty tenders for the lattice girder, and twenty-five tenders for the construction and erection of ironwork for retort-house roof. Messrs. Rubery & Co.'s tender was the lowest. Twenty tenders were received for the supply and erection of river bridge. Messrs. Eastwood, Shingler & Co.'s tender was not the lowest, but being a firm accustomed to large railway work, the committee thought it well to place the order with them.

THE local district council, Bristol, in connection with the National Registration of Plumbers held an examination at the Merchant Venturers' School, when the candidates attended from Bristol, Bath and various parts of Gloucestershire and Wilts, and were examined in the theory and practice of the trade. Sixty per cent. of the candidates succeeded in passing the full examination qualifying for registration. The examiners were Mr. T. S. Pope, architect; Messrs. S. Sydenham (Bath) and J. H. Holbrook, master plumbers; Mr. T. J. Edmonds, journeyman; and Mr. Walter H. Perry, assistant hon. secretary.

THE Bradford Town Council have accepted the tender of Messrs. A. Broxup & Son for the erection of a retort-house (exclusive of roofing) at Birkshall Gasworks for the sum of 4,390*l.* The chairman of the committee explained that the supply of gas was not equal to the demand. In December 1888 the consumption of gas was 192 million cubic feet; in 1889 it was 205 million; and in 1890 it was 217 million. It was proposed to put down retorts only as they were required, and before the building was filled two or three years would have to

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elapse. Up to the present time the Birkshall works had cost 154,225*l.*, and the maximum quantity of gas which could be produced in one day was 2¼ million cubic feet; but when the second portion of the works was complete they would be able to produce 3 million cubic feet, and as this second portion would probably be finished for 55,000*l.*, the cost of the production of gas would be largely reduced.

CONTRACTS for streets and other works have been accepted by the Streets and Buildings Committee of the Edinburgh Town Council:—Stewart's Granolithic Company—Tantallon Place pavement, 79*l.* 7*s.* 1*d.*; Sciennes Hill, 117*l.* 3*s.* 9*d.*; Morningside Road, 142*l.* 5*s.* 10*d.*; Rose Street Lane, 106*l.* 11*s.* 3*d.*; and Belford Road, 61*l.* 14*s.* 7*d.* Works in connection with the public sewer, William Street—James Morrison & Son, 568*l.*; sewer works, Lower Gilmore Place—R. Wallace, 115*l.*

THE volunteer drill-hall, Dumfries, has been lighted by Messrs. Milner & Son, of Edinburgh, by means of Wenham regenerative gas-lamps, with the approval of the architect, Mr. A. B. Crombie.

THE tender of Mr. Wilson Hartnell has been accepted for the providing and fixing of fittings required in the lighting by electricity of rooms in the Municipal Buildings, Bradford, for the sum of 630*l.*

THE Perth Gas Commission have resolved to borrow 1,000*l.* for three years, at 3½ per cent., in connection with the extension of the works. In reply to Treasurer Dewar, Bailie Bridges, Convener of the Works Committee, said that they were now within 600*l.* or 700*l.* of their borrowing powers, but they would not require to borrow any more.

The Plans and Works Committee of the Edinburgh Town Council recommend that the main staircase in the Municipal Buildings should be continued lower down the block in order that access might be had to the town's property below, which it is intended to utilise as offices. The cost will be 680*l.*

TWO or three years ago Mr. E. Pritchard, C.E., of Birmingham, was instructed by the Municipality of Cape Town to report upon the best means of sewering the district and disposing of the sewage. Mr. Pritchard prepared a report in which he recommended a sewerage scheme with a large carrier for conveying the sewage to a point in Table Bay where it could be discharged into a current of water constantly setting out to sea. Mr. Pritchard was asked to adopt certain modifications, which included a much shorter carrier. He, however, demurred on the ground that it would lead to the pollution of the bay. The result was that nothing was done. Ultimately, however, an appeal was made to the Government, who appointed Mr. Clement Dunscombe to investigate the subject. That gentleman has made a report. Although it makes no mention of Mr. Pritchard's report, the recommendations it contains are practically identical with the scheme proposed by Mr. Pritchard, the *Cape Argus* of June 24 says:—"It is very hard on Mr. Pritchard, to whom we owe at least a recognition of his sound judgment in the scheme of his which was rejected, and there is all the more reason why we should accept substantially the same scheme when it comes to us recommended by an engineer of Mr. Dunscombe's standing."

THE stair-treads manufactured by Messrs. Mason & Co., Barbican, E.C., have been designed for durability, with the advantages of being fixed with ease and simplicity and affording a firm foothold. They are formed of a combination of chilled steel and lead, fibre or any non-slipping substance, and it is claimed for them that they are cheaper than anything of the kind at present in the market.

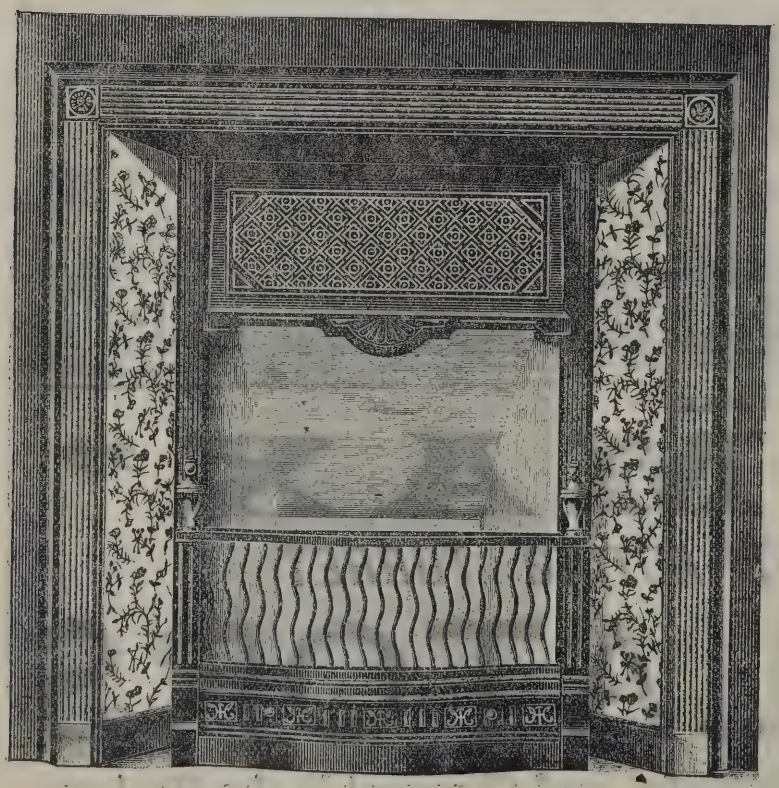
AFRICAN MISSION AND TRADING STATIONS.

THE Livingstone Committee have been endeavouring to devise a healthy house for Central Africa, and have sent out tons of galvanised iron roofing, the freight of which into the heart of Africa far exceeds the original cost. As the result of a conference of experts in Glasgow, Mr. Binnie has drawn up the following suggestions, which are now being carried out by the artisans and missionaries on the spot:—

1. The Site.—The whole space to be covered by the house should be raised two or three feet above the surrounding ground. The lower part of this raised platform should be formed of large stones; the upper part of small stones blended with gravel, and made suitable for a brick floor. Let a trench be dug round the house near the edge of the raised platform, say three feet wide by one and half or two feet deep, with channels cut to carry off any water that may collect.

Note.—Where stones suitable for the raised platform cannot be obtained, the site of the house should be thoroughly dried by drains not more than six or seven feet apart and one and a half to two feet deep, formed by filling the lower part of a trench with small stones, these drains to run into the trench above described.

CROSTHWAITE'S PATENT STOVES, WITH ADJUSTABLE CANOPIES.



No. 315c.—Register.
PATENT ADJUSTABLE CANOPY,
BRICK BACK, AND BARS.

A NEW ILLUSTRATED PRICE LIST, containing 80 pages of Stoves, Interiors, &c., is now ready. Those desirous of having a copy will please forward their name and address to the Patentee,

Robert Crosthwaite,
Ironfounder,
153 Queen Victoria Street,
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PATENT No. 2496. A.D. 1884.

2. Floors to be formed of hard-burned bricks of a large size, grouted with lime or cement.

Note.—As lime is difficult to be got and costly, only a little will be available, but whatever is used should be good—one part of lime to three parts of sharp sand. Poor lime is worthless.

3. Walls to be of hard-burned bricks, a course at the level of the floors to be built with good lime.

4. Roofs to be of galvanised corrugated iron, carried on wrought-iron bound couples and purlins. One class of roofs to be for houses 38 feet wide, another set to be for houses 18 feet wide; in both cases the roofs to be one foot wider than the houses are over the walls, to allow through ventilation under the iron sheets and over the mat ceilings mentioned below. The larger roofs should have verandahs on each side eight feet wide, and the smaller roofs verandahs six feet wide. These should be kept open to admit of through ventilation.

5. The verandahs will require to be supported by posts. These need not be very strong, and possibly some of the kinds of wood not attacked by white ants may be available. If wood subject to the attack of the white ants is used, the posts should be set on sheets of tin or large hard-burned bricks.

6. Ceilings.—The ceilings of the various rooms to be formed of native mats.

7. Fireplaces should be provided in all rooms for ventilation, even when they are not used for heating.

8. The main couples of the roofs should rest on large flat stones built in to the top of the walls. As a good deal of weight will be concentrated at the points where they rest, the building of the walls should be done with special care at these places.

LIVERPOOL WATER-SUPPLY.

IN the arbitration case before Sir John Coode in the action of Messrs. Monk & Newell, contractors, against the Liverpool Corporation for the construction of the tunnel under the Mersey, Mr. Hawksley, who was examined, was recalled. He said that since he was examined he had read the evidence of Mr. Deacon. It was not correct, as stated by Mr. Deacon, that the plan for the water scheme was his own with some modifications suggested by witness. The statement of Mr. Deacon as to the scheme had surprised him. The whole scheme was his and not Mr. Deacon's. He recollected the record of the borings made in 1881 being sent to him in 1882. The plan was not prepared for the purpose of being submitted to the Board of Trade, but for the purpose of carrying out the work. The design was never departed from. It was sent to Mr. Bower, the then chairman of the Water Committee, in order to show him what would have to be done under the altered circumstances. From that design a cartoon was made for Parliamentary purposes, and in September 1882 he wrote a letter to the chairman of the Water Committee stating that he thought that they would have to drive to a considerable depth, that in his opinion it was essential that the tunnel should go down to the red sandstone, and that the cost would be 70,000*l.* or more.

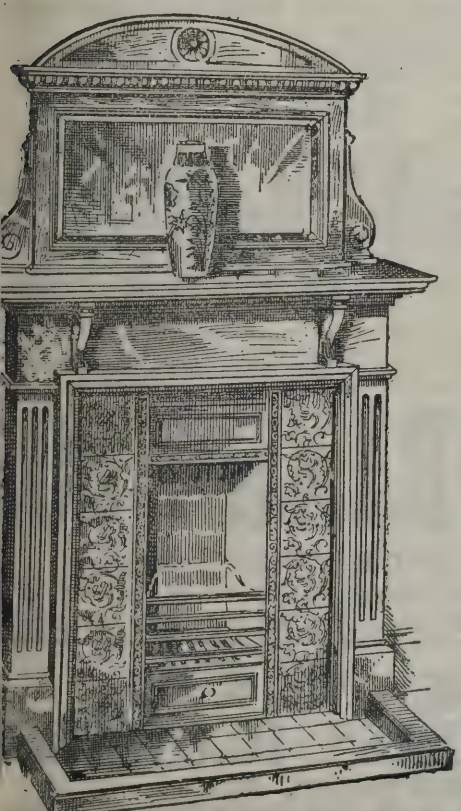
Cross-examined by Mr. Balfour Brown, witness said it was when the Bill was before Parliament that it became evident to him that they would have to go deep owing to the opposition of the Manchester Ship Canal Company and the Warrington Corporation. In consequence of that opposition a clause was inserted in the Bill to the effect that they would have to go to a depth to be prescribed by the Board of Trade. It then became evident that they would have to go a considerable depth into the silt. The Board of Trade would not allow the Corporation to lay the pipes at the depth they had shown on the Parliamentary plan. It was after that that he desired borings to be made in order to inform his mind as to the real nature of the strata below the surface. The Corporation went to Parliament with the idea they would be permitted to lay pipes in the trench of the river, but they were not allowed to do so.

Re-examined: The clay, as shown by the borings, was very liable to contain pockets of sand, which sand would bring in water from the river.

Mr. Francis Fox, C.E., Westminster and Liverpool, having given evidence to the effect that he and his brother, Sir Douglas Fox, were joint engineers for the construction of the railway tunnel between Liverpool and Birkenhead, described the nature of the strata through which they passed in doing that work, and said they never had occasion to use compressed air in connection with it. He visited the works at Fidler's Ferry in December, 1889, and found the shaft full of water. From what he saw he thought the contractors were trifling with the matter. The machinery was entirely inadequate, and of a wrong shape altogether. The pumps were of a wrong description, and he did not think the compressed-air apparatus was of the best kind.

Sir Frederick Bramwell, C.E., said he was well acquainted

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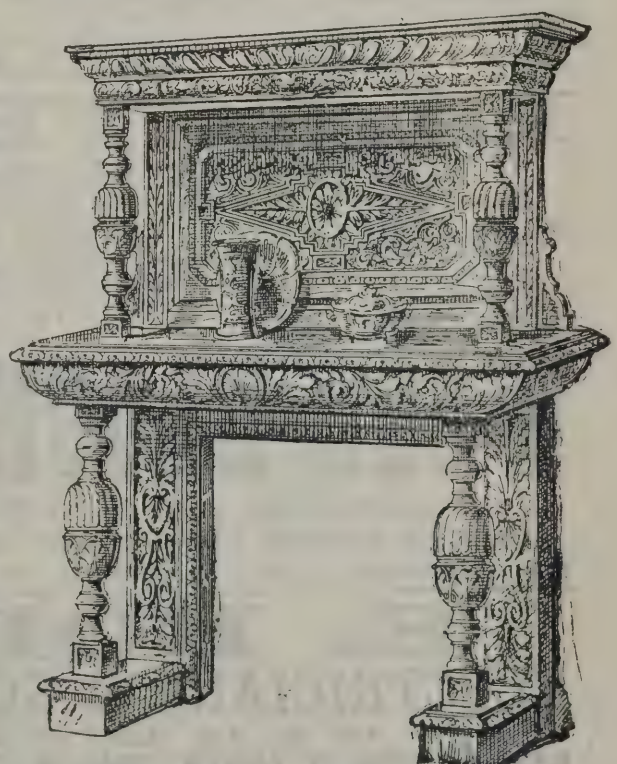
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with the Vyrnwy water supply. Tunnelling was always objected to on account of its expense, and that was the reason why the Corporation desired in their Bill to be permitted to lay down pipes in a trench to be cut in the bed of the Mersey. He had read the specification, and seen the drawings. There was no ambiguity about the specification. He never knew a specification which was more clear, and he certainly thought the contractors ought to have known from it what they were going to do. There was sufficient in the samples to warn the contractors that they would have to pass through water-bearing strata. It was a most imprudent thing to have taken the compressed air from the Cheshire side. If it had been permitted to remain, the difficulty which had occurred would have been got over.

Cross-examined: He still adhered to the opinion that the contract was for a lump sum, and that there was no ambiguity about the specification. As to the work at Vyrnwy, he had never seen better work. It was a credit to the Corporation and to the engineer, and would last for ever.

Mr. H. Williams, in a letter recently published, says:—I always regarded this Mersey crossing as the most difficult point of the scheme, and in my report of 1877 (which was in the hands of the Water Committee prior to Mr. Deacon's report) referred to it.

Mr. Williams, in his report, recommended bringing the water into Liverpool by means of an aqueduct. He says:—Being familiar with the geological features at the crossing point, I am able to say that the very condition of soil which presents almost insuperable difficulties for the construction of a tunnel, affords the greatest facilities for the screw-piling for the aqueduct under my scheme. Even now I am convinced that it would be to the advantage of the Corporation to abandon the present plan altogether, obtain powers for the construction of the aqueduct, and proceed at once with new works. I am convinced that to persevere on the present lines would be simply to pour the ratepayers' money into the Mersey, as the water is now pouring in. I have had special experience of the "flexible joint," which I believe I was the first to adopt at Pemberton as being suitable for a mining district, liable to subsidences. Under such conditions, and where it is accessible for frequent inspection, it is a suitable joint; but although it is my own design, I should be the last to recommend it for a submerged pipe, especially when there is an alternative method, viz., the method I designed in special reference to this Mersey crossing, which I explained in general terms in my report of 1877, and of which I still have the detailed drawings and estimates. I cannot help adding that I consider it most unfortunate for Liverpool that Mr. Hawksley's services were dispensed with at the time when they were of the utmost value. It was a mistake of the most disastrous character. I believe Mr. Hawksley's powerful assistance was needed to carry the scheme through Parliament, and that was why he was retained. But, after all, the actual construction of the works was the most vital point of all, and to take it out of the hands of experience, and turn it all over to the tender mercies of inexperience, was a mistake for which the ratepayers will have to pay, and which should be rectified without regard to private feelings, susceptibilities, or prejudices.

THE PANTILES, TUNBRIDGE WELLS.

ON Saturday, the 11th inst., application was made in Mr. Justice Stirling's Court by the representatives of the Lord of the Manor of Rusthall, asking for an injunction to restrain the Corporation from excavating or building upon any portion of the place known as the Pantiles or the Parade, Tunbridge Wells, in contravention of the provisions of an Act, 13 George II., c. 11, and also for a mandatory injunction to compel the Corporation to pull down and remove the building in course of erection by them upon the Parade and intended for use as a public urinal, water-closet and lavatory, and to properly fill up any excavations made by them upon the said ground for the purpose of such building. It appeared that underneath the Parade, which is one of the most popular places of resort in Tunbridge Wells and in close proximity to the band-stand, the Corporation had recently constructed an underground urinal, &c., and the plaintiffs objected to it on the ground (1) that it would create a nuisance; (2) that by a private Act of Parliament passed in 1739 the erection of such a convenience in this situation was expressly prohibited; and (3) that, even if it were not so expressly prohibited, the Corporation were acting in excess of their powers by excavating the soil of the street to a greater depth than they were entitled to do.

Mr. Justice Stirling, without calling upon counsel for the Corporation, said that this was a motion on behalf of two gentlemen in whom was now vested the manor of Rusthall to restrain the erection by the Corporation of Tunbridge Wells of a urinal, water-closet and lavatory under a well-known place of resort in Tunbridge Wells called the Pantiles. Three grounds were alleged in support of the application—(1) that the erection in question constituted a nuisance; (2) that it was contrary to the

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provisions of a private Act of Parliament passed in 1739; (3) that, even if that were not so, the Corporation had exceeded the powers under which they claimed to act. The first point was a question of fact, and his lordship, having carefully considered the evidence, was of opinion that in its present state there was such a conflict that he would not be justified in granting an interlocutory injunction. His lordship was further informed that it was not desired to abandon that part of the case, and that there was to be a further trial of the action. The two other grounds raised questions of law, and if he thought the right of the plaintiffs was clear, he should have thought it a proper case for an injunction. Under the circumstances, however, his lordship thought it was desirable that the case should be tried out once for all. In 1890 was passed the Tunbridge Wells Improvement Act, by section 93 of which it was provided:—"The Corporation may erect and maintain or permit to be erected and maintained in any street or public place or on land belonging to them or on land belonging to any person, with the consent of the owner, lessee or occupier thereof for the time being, water-closets, urinals and lavatories for the use of the public." Under the powers conferred upon them by that Act the Corporation had proceeded to construct the convenience now complained of. Passing to a consideration of the question whether the Corporation had exceeded their powers, his lordship said that under the Public Health Act, 1875, the streets were vested in them as the local sanitary authority. They were entitled to erect conveniences of this kind. But it was said that although it was open to them to erect such conveniences above the surface of the ground, and for that purpose to excavate the ground with a view of putting in foundations, &c., yet it was not open to them to construct the building entirely underground. That was a question of some doubt and difficulty, and none the less so having regard to the broad way in which the law had recently been laid down by Mr. Justice Chitty in the case of Fareham Local Board *v.* Smith. In that case the learned judge said:—

"The road was, under the Public Health Act of 1875, a street vested in the local board, and, according to the authorities, what was comprised in the term street was not merely the surface of the road, but the soil below the surface to such a depth beneath as was required for the purpose of enabling the local authority to execute its statutory powers and to perform its statutory duties. The depth to which the board's statutory right extended below the street was not defined by the Act of Parliament, but it was ascertainable. Another way of stating the same proposition was to say that there vested in the local board the area of user of the street below its surface. The exact depth to which such user might extend obviously differed in different cases; for instance, the depth of a properly constructed sewer would in some roads have to be lower than in others. The proposition was founded on the decisions given in the cases of Coverdale *v.* Charlton (4 Q.B.D. 105), and Wandsworth Board *v.* United Telephone Company (13 Q.B.D. 905) with respect to the rights of local boards under the surface. The latter case also, in his opinion, showed that a similar and corresponding proposition might be correctly stated with reference to the zone above the surface of the road. The local authority was entitled to take so much of the zone above as was required for the due execution of its powers and the due performance of its duties. To express the matter shortly, it was the area of user which showed what was vested, and the street comprised the zone. The local board had a proprietary right in the zone above the surface, or, at any rate, had a possession of so much above and so much below as fell within the objects of the Act."

It might be contended that the Corporation had a proprietary right in the zone below the surface, and that the excavation complained of in this case was required for the purpose of enabling the local authority to execute its statutory powers and to perform its statutory rights. That, like the other, was a question of law of some difficulty; and having regard to that, and that the questions of fact could not now be finally determined, his lordship thought that the better course would be to direct the motion to stand over till the trial of the action. His lordship added that as to the third point, viz., the right to excavate, all the injury was already done, and that was an additional reason, so far as regarded that particular ground of relief, for refusing the interlocutory injunction.

ORDERS FOR EXTRAS TO SUB-CONTRACTORS.

THE remarkable action brought by Messrs. Heighway & Dupree, builders, Piccadilly, against Messrs. Kirk & Randall, contractors, was again heard at the Maidstone Assizes. Plaintiffs claimed for certain alterations and additions carried out at the Tivoli Music-hall, London, under contract with defendants. The following report is from the *South-Eastern Gazette*:—

In the year 1888 the plaintiffs had contracts with Messrs. Kirk & Randall in respect of certain work to be done to the

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Café Monico, near Piccadilly Circus, and the Tivoli Music-hall, in the Strand. These contracts had proceeded to a certain extent when disputes arose between the parties as to their respective rights, and the plaintiffs in this action commenced proceedings in the Queen's Bench Division against Messrs. Kirk & Randall in respect of work done under the contracts existing between them. These proceedings were put an end to by an agreement, and it was upon this agreement that the present action was founded. The case was tried by Mr. Justice Stephen at the last Assizes, when the learned judge held that the plaintiffs' view in the matter was correct, but nevertheless sent the case to the Official Referee. This decision was carried to the Court of Appeal by plaintiffs, and it was there held that there was no case for the Official Referee at all, and the action was sent down for re-trial. The main question was as to whether the architect engaged by the Tivoli Company had power under the agreement entered into by the parties concerned to order the work, the price of which plaintiffs claimed. A jury had been empannelled to try the action, but before the case had proceeded far it was agreed by counsel that his lordship should deal with the matter in dispute, the questions involved being of a very complicated character. Evidence in support of the claim was given by Mr. C. J. Phipps, the architect engaged by the Tivoli Company, and Mr. Dupree.

Mr. Channell, Q.C., called Mr. Joseph Randall, one of the defendants, and this witness's brother was also put into the box, the evidence tending to show that all authority to order the work in question had been withdrawn from the architect, and that the extras ordered by Mr. Phipps comprised structural alterations which, even if authority had not been previously withdrawn, he had no power to order under the contract given Messrs. Heighway & Dupree, which had reference to decorative work only. Mr. Randall mentioned in the course of his evidence that he had sustained a loss of 25,000*l.* over the Tivoli contract, the company being in liquidation.

Mr. Winch, Q.C., submitted that the defendants had no power to revoke the agreement into which they entered with the plaintiffs, under which agreement he held Mr. Phipps was given full authority to order the work in respect of which the claim was made.

His lordship gave judgment for the amount claimed, 2,353*l.* He observed that plaintiffs' case was that the architect clearly had power to give the order for the work in question, that they had executed that work in good faith, had obtained their certificate, and were therefore entitled to be paid. The architect was called by plaintiffs, and he had stated that the work had been done by his authority and under his supervision, that he was perfectly satisfied with the way in which it was executed, and that in his judgment plaintiffs were clearly entitled to be paid the amount sought to be recovered. Now, for the defendants it was sought to be shown by the cross-examination of the plaintiff, and also by independent evidence, that the defendants ought not to be held to be liable. Mr. Channell's point was, he believed, that the agreement of March 6 between Kirk & Randall and the Tivoli Company was to do specific work, that there was a clear intention that there should be no extras which Kirk & Randall should be bound to do, that the plaintiffs, who were sub-contractors, were aware of that contract, and knew of the object of it, and that their contract in the month of October was entered into upon the same lines. His lordship held that under the contract entered into between the parties the architect was given full power to order the extra work in respect of which the claim was made, and that defendants could not escape from responsibility for the payment.

IMPROVEMENT OF THE DEE AT CHESTER.

THE following important report from Sir John Coode, C.E., on the treatment of the River Dee, in order that the health of the inhabitants of Chester may be protected, is at present under the consideration of the Public Health and Sewering Committees of the Corporation :—

Gentlemen,—In accordance with the instructions conveyed to me by your town clerk, Mr. Samuel Smith, I proceeded to Chester on April 9 for the purpose of examining the locality and making myself acquainted with the principal points bearing upon the matter referred to me. On the evening of my arrival I had the great advantage of a lengthened conference with the town clerk, who placed before me Dr. Ballard's report to the Local Government Board of April 1890 and his memorandum of June 1890 ; a copy of the decision of Mr. Horatio Lloyd on the question of the pollution of the River Dee by owners of certain property in Queen's Park ; analyses of the Chester water by Mr. Campbell Brown on October 6, 1890, and by Mr. Lowe, city analyst, on October 14, 1890 ; together with the annual report of the medical officer of health of the Chester Urban Sanitary Authority, Mr. Kenyon, to which is appended an analysis of the water supplied to Chester for each month of the year 1890. I should mention that the city surveyor, Mr.

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Matthews Jones, was present and took part in this conference, which proved of much service in placing before me matters connected with the salient points requiring my attention.

During the whole of April 10 and up to the middle of the following day I was occupied in examining the river between the Sewage Works at Sealand, below the city, and the Iron Bridge, near Eaton Hall, and met, about the time of high-water, a few of the committee appointed to confer with me, at the Old Dee Bridge, when a memorandum asking my attention to certain points was handed to me by Mr. John Whalley. On the following day I completed such local investigations as were necessary for me to make personally, and attended, at the town hall, a meeting of the special committee nominated to confer with me on the subject generally.

Finding it requisite to obtain exact and reliable data as to the tidal range at, and above, the site of the weir, levels of land liable to flooding, &c., I sent a competent assistant, Mr. Wilson, to make the necessary local observations, which have been obtained and are now before me. Having carefully considered, with the information thus provided, the points on which my opinion is desired, I beg now to submit my report thereon. The chief questions referred to me are :—(1) The practicability of preventing the tide flowing over the weir at the Old Dee Bridge ; (2) the advisability of so doing ; (3) the probable cost ; and (4) the likelihood of its being sanctioned by Parliament.

With regard to the first of these questions, I have to state that it is quite practicable, by more than one method, to prevent the highest tides flowing over the weir.

As to the second question, *i.e.* the advisability of so doing, the answer involves several considerations, the first, and by far the most important, of which is, the effect which such prevention would have upon the navigation of the Dee below the city.

It was mainly to obtain such data as would enable me to form such idea on this point that my assistant was directed to proceed to Chester. By means of the observations he was instructed to make, supplemented by others previously made in the locality, I have been enabled to arrive at a standard for comparison with the Admiralty time-tables, and thus to attain the results given below. It is, of course, to be understood in this, as in all similar cases, when dealing with tides, that the numbers and heights must, of necessity, be open to changes consequent upon the prevalence or otherwise of strong winds from the different quarters of the compass ; but, subject to this contingency, the figures given below may be accepted as sufficiently accurate for our present purpose for 1891, and indeed for any other year.

Stated in a tabular form, the number of tides that would top the Chester weir would be as follows :—To the extent of less than 1 foot, 101 ; from 1 foot to 2 feet, 51 ; from 2 feet to 3 feet, 35 ; from 3 feet to 4 feet, 19 ; from 4 feet to 5 feet, 11 ; total, 217.

We must arrive at the fact that three-tenths of the whole number of tides in the course of a year, or of any other lengthened period, flow over the top of the weir ; and further, it is important to note that practically one-half of the tides which do flow over the weir cover it to depths varying from 1 foot to 4 feet. It may be added that tides occasionally, but rarely, rise to such a height as to submerge the weir to a depth of 6 feet.

With regard to the volume of tidal water, I caused measurements to be made by my assistant on two successive days during his stay at Chester, from which I am led to the conclusion that, on the occurrence of every tide rising 2 feet 6 inches above the top of the weir, about 14,000,000 cubic feet would flow into the compartment of the river above the weir. In the absence of an extended series of observations, the expense of which would not be warranted under the circumstances, I am unable to say with exactitude what would be the volume of tidal water flowing into the compartment of the river on the up-stream side of the weir on the occurrence of a tide rising 5 feet above its crest, which, as will be seen by the foregoing table, occasionally occurs ; it may, however, be certainly taken as upwards of 30,000,000 cubic feet.

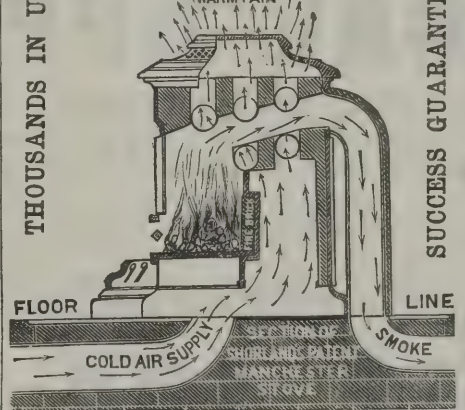
The exclusion of such a quantity of tidal water as now flows over the weir, even on a tide rising only 1 foot above its crest, would be prejudicial to the navigation of the Dee below Chester, in consequence of the reduction of the scouring power due to the loss of that quantity passing up and down twice during each twenty-four hours. I may mention in this connection that the Admiralty Commissioners, in their report of January 24, 1850, evidently entertained an opinion adverse to the exclusion of any further quantity of tidal water, inasmuch as they said, "In regard to the upper part of the navigation, we have to remark that eventually a considerable change may be affected in its character by the removal of the weir above Chester Bridge and the admission of a considerable length of tidal column."

Mr. H. E. Taylor, engineer to the Dee Conservancy Board, has been good enough to furnish, at my request, particulars, as given by the Custom House, of the shipping using the Dee,

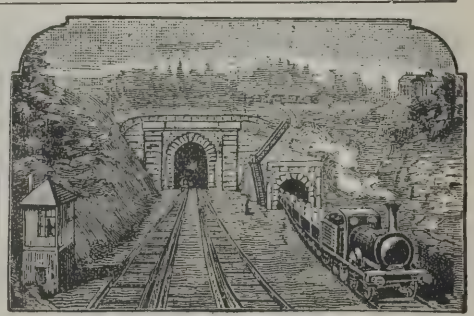
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from which I gather that the number of vessels navigating the river below Chester during the last seven years has been on the average 2,462 per annum, and the registered tonnage 190,722 per annum. Moreover, in consequence of the recent improvement in the depth of water, vessels of a larger class are now trading to Connah's Quay and the upper river than formerly.

It is evident from these considerations that the navigation is by no means an unimportant one ; it follows, therefore, that any such reduction of the present scouring power as that which I have above indicated would be seriously detrimental to the navigation of the Dee throughout the whole of its course below the city. In view of these facts, I am led distinctly to the conclusion, as regards the second question, that any raising of the weir would be unadvisable.

As regards the fourth question, I am equally decided in opinion—based on the same facts—that there is no likelihood that any raising of the weir would be sanctioned by Parliament, and I am fortified in that opinion by the circumstance that the modern and approved practice in the treatment of tidal rivers is opposed to such a raising as would be necessary to exclude the tidal water from the compartment of the river above the weir at Old Dee Bridge.

In view of what has been hereinbefore stated, I need not dwell at any great length upon the question propounded at the meeting of the special committee at the town hall on April 11. I may say, however, after having caused the land on either side of the river to be examined as far up as Lower Hall (which is the extreme limit of the tidal influence, and rather more than eighteen miles above the city), that the conclusions at which I have arrived may thus be stated in general terms :—

(*a*) If the weir were raised, the flooding of the lands above would be increased, and the various outfalls in the upper river would certainly be throttled in wet seasons, unless the tidal exclusion was effected by a series of movable sluices constructed along the crest of the weir, such sluices to be brought into play when the upland waters might so require ; but, inasmuch as the exclusion of the tidal waters could not be permitted, for the reasons hereinbefore stated, I need not enlarge upon this further than to remark that the evil consequences which would follow from the exclusion of the tide above the weir by means of movable sluices would, as far as the tidal waters are concerned, be just as great as if a solid weir had been constructed. I may say, nevertheless, that between Chester weir and the Iron Bridge there are about 460 acres of low-lying ground, that between the Iron Bridge and Farndon Bridge there is an area of about 2,400 acres, known as Trevalyn meadows, and that between Farndon and Lower Hall there is an area of about 1,250 acres, all of which would be immediately affected by flooding in a greater or less degree by any raising of the weir.

(*b*) As to the possible effect on the lower part of the town near Crane Street, I have considered this question in view of the tidal observations made to enable me to arrive at a conclusion on this point, and am of opinion that the raising of the weir would not cause any appreciable rise in the level of tide there at the time of high water.

(*c*) The raising of the weir would undoubtedly cause a considerable loss of "head" at the mills during dry seasons, seeing that, under present conditions, from eight to twelve tides during each fortnight overtop the weir, and during such seasons these tides compensate for the deficiency of fresh water in the river ; consequently the mills would be injured by the raising of the weir.

(*d*) With regard to the prevention of salmon getting up the river, if it were decided to raise the weir, the proper course would be to provide one or more salmon "ladders" by means of which this difficulty would be met.

(*e*) The effect on the navigation has already been dwelt upon.

(*f*) If the spring tides were arrested at the weir there would be occasions when some deposit would take place at the lower side, but such deposit would in all probability be scoured away on the occurrence of heavy land freshes, but it is by no means certain that the result might not be the formation of a shoal lower down.

(*g*) In the event of the weir being raised, provision could of course be made for the passage of boats from the upper to the lower river, and *vice versâ*, by means of a lock, as in the case of the Upper Thames and other rivers.

It will be readily understood, in view of what I have hereinbefore said, that I have regarded it as altogether superfluous to give instructions to my assistants to work out the details of an estimate of the cost of raising the weir, that being the third question contained in the town clerk's letter to me of February 26 ult.

As to the question of the sewage from both sides of the city, seeing that the exclusion of the tide from the compartment of the river above the weir is not advisable, having regard to all the circumstances of the case, I consider that no time should be lost in adopting some course whereby the whole of the sewage from both sides of the river should be so dealt with as

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to be removed to a distance from the city—indeed, as far as practicable, at a reasonable cost—and there passed through land, if such can be found suitable for the purpose, and if not, that it should be purified by chemical treatment. At any rate, in view of the fact that the passing tides must be permitted to flow over the weir for from eight to twelve tides during each fortnight into the compartment of the river whence the water supply for the city is drawn, the effluent from the sewage farm or works (as the case may be) should be brought to the highest possible condition of purity. Whether, even when this may have been done, it will be expedient to continue to draw the supply for the city from the present intake, or whether resort should be had to a more unexceptionable source, opens up a large question, and is a matter upon which I do not understand that I am asked to express an opinion.

It only remains for me to state, and I have much pleasure in so doing, that your city surveyor, Mr. Matthews Jones, rendered me every assistance that I desired during my own personal inspection, and I have to thank him also for the facilities afforded to my assistant whilst he was engaged in the locality.—I am, gentlemen, your obedient servant,

JNO. COODE.

RAILWAY VENTILATING SHAFTS.

THE Second Division of the Court of Session have reversed a decision pronounced in the Dean of Guild Court, Glasgow, and authorised the North British Railway Company to proceed with the erection of a ventilating shaft in West Regent Street. The Dean of Guild refused the lining craved, and dismissed the petition, holding that the proposed shaft was in contravention of the conditions in the feu contract, in respect (1) of being greatly in excess of the height of buildings allowed to be erected, (2) as proposed to be erected of brick instead of stone, and (3) for a purpose that could not but be nauseous and hurtful to the neighbouring feuars in a district which was almost entirely residential. Against this decision the petitioners appealed to the Second Division, and their lordships recalled the Dean of Guild's interlocutor, and found the appellants entitled to expenses.

The Lord Justice-Clerk said that the North British Railway Company, who had a line which ran below a considerable part of the city of Glasgow, were under an obligation enforceable by the Dean of Guild to have the underground part ventilated, and to carry out this obligation they had purchased a property not very far from Blythswood Square, and proposed to erect a ventilating shaft from the top of their tunnel running at right angles to the street, but at some distance from it, and then to erect a brick shaft for the purpose of carrying off foul vapours from the inside of the tunnel. It was not disputed that the railway company had a right to this ground, and a right to use it, except so far as they could be restricted by contract. Any question between the superior and the feuar was out of the case, because the superior did not object to what the company proposed to do, and the sole question was whether the neighbouring feuars had a right to prevent the railway company's action. Their right to interfere with one of the Blythswood feuars must be something of the nature of a servitude of a dominant over a servient tenant. There was no contract between the feuars who were objecting to this being done and the railway company, and therefore the servitude must be found, if it existed, to be imposed on the railway company by the conditions of the feu contract to which they got a right by purchasing the property from the previous proprietor. It had been very clearly and distinctly decided by the House of Lords in the case of Hislop, that where a feu charter from a common superior contained the same conditions as regarded the different feuars in a particular street or district, and where all the feuars had an interest in the observance of the conditions which were set forth in these contracts, that, notwithstanding, a feuar might have no right whatever to enforce the conditions against the other feuars unless he had a direct stipulation in the titles to do so. The result of a careful consideration of the feu contracts on this part of the Blythswood estate led his lordship to the conclusion that it had been thought advisable to give each feuar a servitude right against the remaining feuars, but most certainly, beyond what was there specified, there was nothing to touch at all the proposed erection by the railway company unless it were that they were to carry on a nauseous or hurtful business. The erection of a shaft to carry off vapours might be held to be so under this contract, but that was a totally different question, and independent altogether of the authorities. Whether, after this erection was made, it turned out to be nauseous or a nuisance to the neighbourhood which could not be put down, was a question which could not possibly be decided except upon the facts as they arose. To decide it at present was anticipating altogether what the effects of putting up the shaft would be. If it should turn out to be a nuisance, then it could be prohibited.

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HINTS ON TIMBER.—IV.

American Deal.—Having in our last article on this subject described the different kinds of deal imported into this country from the Baltic, we may now go on to the same description of goods obtained from America, namely, American white and American yellow deal.

White Spruce Deal.—American white deal is the wood of the *Abies alba* or *nigra*—or in other words, spruce, or white pine logs sawn into planks, deals, &c.—and is known in the timber market as white spruce deal (or American, Canadian or New Brunswick spruce), to distinguish it from the white deal imported from the Baltic, to which it is considered to be slightly inferior both in strength and durability, though, from its being of a freer growth, it is straighter in the grain, less knotty, and can be obtained in wider and longer planks. White spruce deals, &c., are sorted into first, second and third qualities.

American Yellow Deal.—The yellow pine (*Pinus Strobus*, or Weymouth pine) when sawn into planks, deals and battens, is known in our markets as "American" or "Canadian yellow deal," and is largely used for joiners' work on account of its being exceedingly straight in the grain and free from knots, besides being easy to work and obtainable in planks of very great width, frequently running as wide as 30 inches. When wrought with the plane it is readily recognised, from the surface being covered with short, fine, darkish marks, like scratches made with the pen, in the direction of the grain.

Deals, how Classed and Marked.—Baltic planks, deals and battens are, speaking in general terms, classed in the timber market as "Crown," "Crown brack," "1st Quality," "2nd Quality," &c., down to even "5th Quality." Very few crown or crown brack goods come into the market nowadays, there being little or no demand for them for building purposes. The different classes of deals, &c., will be found to vary very much in quality, one shipper's "2nd quality" being often equal to another shipper's "1st quality" deals. Hence some shippers have become well known in the timber market for the greater care with which their goods are bracked or sorted, and consequently their names or trade marks may be safely taken as a guarantee of a high standard in the different qualities into which they are classed. The marks used are always to be found at the ends of the deals, in which position they are readily observed when the timber is stacked.

Russian and Finland deals, which are chiefly 1st and 2nd quality—the inferior qualities not being, as a rule, exported to this country—generally come unmarked into the market, or only dry stamped at their ends by the blow of a hammer, such marks being also termed hard brands, in contradistinction to the wet or soft brands marked in red paint on the ends of Swedish deals. These first and second qualities are known to the shippers as *prima* and *secunda*. Onega and Archangel deals are dry stamped with the shipper's initials or some private mark, and often with a number in addition; this number, however, does not denote the quality, but merely the number of the yard in which they were stored before shipping. In some cases, when the goods are not regularly branded, the second quality have a red mark across the ends, the first and third qualities being readily distinguished from each other. The well-known Gromoff Petersburg deals are, however, stamped with C & Co., being the initials of the shippers, Clarke & Co. Another Petersburg brand in high repute is P B (Peter Belaieff) for *prima*, and P B 2 for *secunda*.

Swedish goods are never dry-stamped or hammer-marked, but are invariably branded with letters or other distinguishing marks in red paint, stencilled on their ends. These marks are made on so large a scale that they render it very difficult to judge of the quality of the wood by mere inspection when their ends only are visible, as is the case when they are stacked in the timber yards; hence an acquaintance with the meaning of the brands themselves becomes all the more necessary. Some of the common fourth and fifth quality Swedish goods are left unmarked, but they may generally be distinguished from Russian shipments by the bluer colour of the sap wood. The first and second qualities in Swedish goods are classed together as mixed, being scarcely ever sorted separately; after which we get third, down to fifth quality. Except for temporary purposes or for rough work, such as slate-boarding, no deals of a lower quality than mixed Swedish, or, as timber merchants would term them, best Swedish, should be used for first-class work. It must be clearly understood that the term mixed is confined to wholesale transactions between shippers, brokers, &c.; the timber merchants always call the mixed best, the thirds seconds, and so on. It is necessary to remember this, otherwise one may be buying deals of a class lower than was intended.

Amongst the Swedish brands which bear a high character—of course new brands are constantly coming into the market—are the following, taking each shipper's marks from the different

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K A B	= mixed	C ♔ B	= mixed
N A S	= 3rd	C + B	= 3rd
* * *	= 4th	C + + B	= 4th
♔ ✕ ♔	= 5th	C V B	= 5th
A ♔ S	= mixed	E K B	= mixed
A + S	= 3rd	E + B	= 3rd
A ◇ S	= 4th	E + + B	= 4th
E L F	= 5th		
K H B	= mixed	S K B	= mixed
H A B	= 3rd	D O M	= 3rd
		D M	= 4th

Holmsund and Gothenburg.

Dickson Bros. & Co.	D B & Co.	= mixed
	D D D	= 3rd
	D	= 4th

Stockholm.

Franke	J	= crown
	F	= mixed
	J E F	= 3rd
	J E F O	= 4th

Sandvik.

♔ S A S ♔	= mixed	
S + A	= 3rd	
S S	= 4th	
S	= 5th	

Kungsgarden and Hernösand.

Bergere	= mixed
Berger	= 3rd
E L B	= 4th
K + M	= 5th

Uleaborg (Finland).

U S (hammer mark)	= mixed	
U S (red)	= 3rd	

The above are but a few of the best known brands of established reputation, but a long list of all the brands of any consequence is published yearly in "Laxton's Builders' Price Book," and should be consulted by all those who wish to know the shipper's estimate of the quality of the goods he is buying, or which are intended to be used in any building under his supervision. A mere glance at the few brands here given will show how necessary it is to exercise care in reading and interpreting the brands on deals; for instance, in the case of Bergere and Berger, the simple omission of an e, which would escape the notice of any one relying on the name only, makes all the difference between mixed and third quality deals; and, again, the letters U S, when stencilled in red paint, indicate third quality, and the same letters, when dry stamped, denote mixed or first and second quality; the mixed being worth from 15 to 20 per cent. more than third quality, whilst the third quality are worth 12 to 15 per cent. more than fourth quality goods.

Norwegian marks are very numerous, but as the chief imports from Norway consist of cheap and very inferior battens (mostly 2½ inches and 6½ inches), they are not worth enumerating. From Christiania, however, some of the very best white deals come, marked H M H for first quality, and H M M for second quality. From Norway also come large quantities of cheap boards for flooring and other purposes, "matched" or grooved and tongued boarding, mouldings, doors, window-sashes, &c., prepared ready for fixing, which may often be advantageously employed for inferior and temporary purposes.

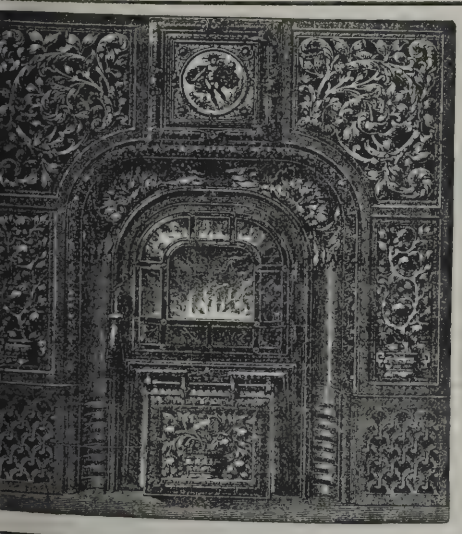
American yellow deal chiefly comes into the market in planks of various widths, which are classed as follows:—

Brights	1st, 2nd and 3rd quality
Dry floated	Ditto ditto
Floated	Ditto ditto

Their order of merit being first quality brights, then first quality dry floated, then first quality floated, after which the second quality of each description, and lastly the third qualities. "Brights" are so-called from the planks not having been discoloured by being floated down the rivers to the ports, and are, consequently, of a much cleaner and brighter yellow. The term "Dry floated" implies that the planks have, though floated down the rivers, been stacked and dried before shipment; whilst the "Floated" goods are more or less discoloured in the operation of rafting or floating down from the felling ground.

First quality yellow deals of each kind should be clean, straight grained, and quite free from shakes and knots. Second quality are a little inferior in these respects, and third quality inferior again. The floating of the deals, besides discolouring them, injures the wood considerably, causing it, from its soft absorbent nature, to warp and shake very much in drying, so

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that floated deals should never be used for the finer descriptions of work. The best ports are Quebec for yellow deals and St. John for spruce deals. Goods from the more southern ports, such as Richibucto, Miramichi, Shedac, &c., are of an inferior quality. Rafted or floated deals are shipped from all the Canadian ports, except St. John; and hence the superiority of St. John deals, which are always bright and unwatered.

American goods are not branded, as a rule, though some shippers use house brands in imitation of the Baltic marks, already described, without, however, following any definite rule, such as the red paint on Swedish goods, &c.; at the same time the quality of the stuff is often denoted by I, II, or III, in red paint upon the side of ends of the planks; but the qualities of American yellow deals are easily told by inspection, the custom in the London Docks being to stack them on their sides, so as to expose their faces to view and allow of freer ventilation, which latter point is of special importance in the case of the floated deals which have been soaked by rafting down the rivers.

Deals, how Sold.—Planks, deals and battens, whether Baltic or American, are usually sold in London by the six score or long hundred (120 pieces) reduced to the Petersburg standard, which is a piece $12' \times 11'' \times 1\frac{1}{2}''$, so that the Petersburg standard hundred = 120 pieces $12' \times 11'' \times 1\frac{1}{2}'' = 1{,}980$ feet super, or 165 feet cube = 1,440 feet run of $11'' \times 1\frac{1}{2}'' = 720$ run of $11'' \times 3''$.

The Petersburg standard of 165 feet cube is that chiefly employed, but the following standards are also sometimes used:—

	Pieces.		Feet cube.	Feet super.
London and Dublin .	= 120	$12' \times 9'' \times 3''$	= 270	= 1,080
Christiania hundred .	= 120	$11' \times 9'' \times 1\frac{1}{4}''$	$= 103\frac{1}{8}$ =	990
,, ,, .	= 60	$15' \times 11'' \times 1\frac{1}{2}''$	$= 103\frac{1}{8}$ =	825
Quebec short hundred .	= 100	$12' \times 11'' \times 2\frac{1}{2}''$	$= 229\frac{1}{6}$ =	1,100
,, long ,, .	= 120	$10' \times 11'' \times 3''$	= 275	= 1,000
Drammen ,, .	= 120	$9' \times 6\frac{1}{2}'' \times 2\frac{1}{2}''$	$= 121\frac{5}{8}$ =	585

Prepared flooring boards are sold by the customary square, which is a given number of feet run, as given below, varying with the width of the board, but always so arranged as to approximate to the ordinary square of 100 feet super.

9 inch.	8 inch.	$7\frac{1}{2}$ inch.	7 inch.	$6\frac{3}{4}$ inch.
140 feet.	160 feet.	170 feet.	180 feet.	185 feet.
6 inch.	$5\frac{3}{4}$ inch.	$5\frac{1}{2}$ inch.	$5\frac{1}{4}$ inch.	5 inch.
200 feet.	210 feet.	220 feet.	230 feet.	240 feet.

THE CHICAGO EXHIBITION.

THE decision of the English Government to take part officially in the great exhibition which will be held at Chicago in 1893 was notified to the Government of the United States some three or four months ago; and we are now able to announce, says the *Times*, that the necessary arrangements have been completed. The Council of the Society of Arts will be appointed a Royal Commission for the purpose of superintending and directing the formation of the British section, and will receive a grant of 25,000*l.* towards the expenses which will be incurred. This grant is less than any previous one which has been made for a similar purpose, that for Paris in 1867 having been 126,000*l.*; that for Paris in 1878, 67,000*l.*; that for Philadelphia in 1876, 40,000*l.*; and that for Vienna, 28,000*l.* The willingness of the Council of the Society of Arts to accept a comparatively small sum is due to the experience gained at the Paris Exhibition of 1889, when no grant at all was made by the Government, and the expenses of the British section were defrayed by the exhibitors themselves, aided by contributions obtained by the Mansion House committee. Sir Henry Trueman Wood, the secretary of the Society of Arts, filled the office of secretary to the British section on that occasion; and the results then obtained convinced him, and have enabled him to convince the Council of the Society, that the Government contribution will be supplemented to any necessary extent. The authorities at Chicago will allot space to the British Commission without charge, and a certain rent will be paid by every exhibitor. This source of income alone, it is believed, will be sufficient to bring up the 25,000*l.* to the full amount which will be required for the expenditure of the Commission. Not only does the Council of the Society of Arts carry with it the prestige of the President, the Prince of Wales, and of the Chairman of Council, the Attorney-General, but it contains many members who are well qualified, alike by knowledge and by experience, to conduct the affairs of the British Section to a successful issue; while the appointment of the Council as a Commission implies also that of Sir Henry Wood as secretary, and justifies the hope that he will be able to bring about at Chicago a success as distinguished as that which rewarded his untiring labours at Paris. The appointment of a "Council," the members of which will not be mentioned by name, as a Royal Commission, is a wide departure from ordinary custom,

HOWARD & SONS,

25, 26, 27 BERNERS STREET, W.,

MANUFACTURERS AND CONTRACTORS.

Deal Dadoes, from 1*s.* 2*d.* per ft. super.
Oak ,, ,, 1*s.* 8*d.* ,,
Walnut ,, ,, 1*s.* 11*d.* ,,
Oak, 1-inch Parquet Floors, laid and polished, from £7 10*s.* a square.
Solid 1-inch Oak, straight boards, laid and polished, at £6 18*s.* a square.

Solid ¼-inch Oak Parquet for covering Deal Floors, laid and polished, from £5 a square.
Oak Wood Tapestry Dadoes, from 1*s.* per foot super.
Walnut or Mahogany, from 1*s.* 3*d.* per foot super.
Ditto, with Heavy Mouldings, 4*d.* foot extra.
Ditto, ditto, with Carved or Painted Panels, prices according to sketches.

Prices given for all Interior Work, Doors, Architraves, Over-doors, Chimney-pieces, Stoves, and Hearths.
Architects' and Surveyors' attention particularly called to the above quotations for

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but in this instance it will be attended by certain advantages. The Council of the Society of Arts is a fluctuating body, some members of which retire annually to make room for others, and it is probable that the ordinary vacancies will be filled next year by gentlemen whose advice and assistance is likely to be of especial value. Whether the retiring members will lose or retain their status as commissioners is a question which the document appointing them will render manifest.

It can hardly be doubted that the Chicago Exhibition will in many respects surpass all which have previously been held; but the question still remains whether English manufacturers will, as a rule, find it worth their while to incur the trouble and the very considerable expense of contributing to the display. On this question opinions differ; and it is perhaps indisputable that, in some trades, no advantage would be likely to accrue to English exhibitors, at least as far as an American market is concerned. In steel rails, for example, Chicago can hold her own against the world. On the other hand, it must be remembered that the exhibition is likely to attract visitors from many countries, as from South America, Australia, China and Japan, and from many markets in which American and English manufacturers are now or soon may be in competition; while, even in America itself, the perhaps only temporary existence of high import duties will not induce the wealthier portions of the community to deny themselves the luxury of English manufactures in those departments in which this country stands unrivalled. In cutlery, in the finer varieties of glass and porcelain, in artistic manufactures of many kinds, rich Americans are likely for many years to be large buyers in England, and the more they see of the wares which England can produce the more certain they are to become impatient of a system which loads these wares with duties of an almost prohibitory character. Textiles should be well represented, and the many manufacturers of them who are even now contemplating the opening of branch establishments in the States would be certain, from the experience of the exhibition, to obtain valuable guidance as to the desirableness of carrying such intentions into effect. In fine art, more especially, this country should hold a foremost place, since American purchasers are already well known in English studios, and will be unable, at least for a long period, to supply their requirements with pictures and statuary of home production. On the other side of the question, it must be admitted that the distance is great, that transit will be expensive, and the trouble of management considerable. Labour also will be costly, and it is doubtful to what extent the Alien Labour Act will prevent the introduction of foreign workmen even for the better arrangement or production of foreign goods.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

11028. William Alexander Bernard, for "A parallel vice."

11064. Arthur Martin, for "Preventing draughts or dust at bottom of doors, automatically rising when door opened and falling when shut."

11068. George William Davis and Richard Southerton, for "An improvement in mathematical instruments and gauges."

11073. Thomas Niccol, for "New or improved means or apparatus for automatically closing watertight doors or valves, such as the watertight doors of ships' bulkheads."

11091. Thomas Andrew McKee, for "A new or improved means of producing enlarged or reduced scales for drawing, and also for dividing straight lines of any length into any number of equal or proportional parts."

11115. William Trebilcock, for "Improved apparatus for adjusting skylights and securing the same in position."

11154. Robert Edward Sudden, for "The prevention of down-draughts in any situation and as a ventilator, entitled the 'Combination' chimney-cowl and ventilator."

11239. Joseph Parkinson, Samuel Fawcett and Charles Frederick Parkinson, for "Improvements in ladders and trestles."

11312. Thomas Bowman Dunn, for "Improvements in or relating to window-sash lifters or handles.'

11360. Alfred Foster, for "Improvements in door locks and latches."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CASSELL, Patent Agents, 37 Chancery Lane, London, W.C.

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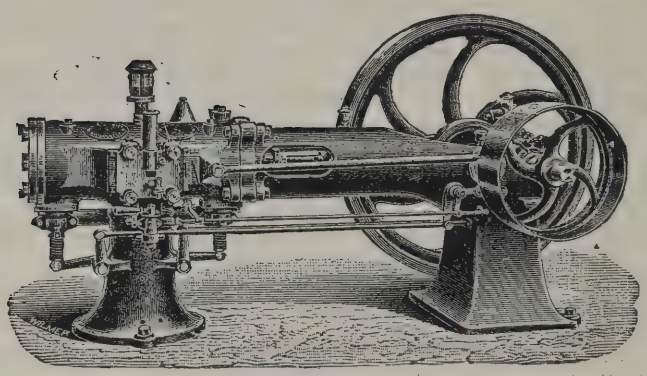
THE

"GRIFFIN" GAS ENGINE.

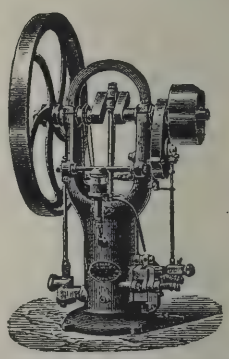
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From ½ to 4-Horse Power.

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SUITABLE AND USED FOR

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AND UNEQUALLED FOR ELECTRIC LIGHTING.

Professor JAMIESON, M.I.C.E., F.R.S., Glasgow, in his Scientific Report, says:—

"Throughout the whole of my electrical test the *Engine* WORKED VERY STEADILY; *in fact I have never before tested a Gas Engine which maintained such uniformity of speed* at full power; *no pulsation or blinking being observable in the incandescent lamps.*"

And Professor KENNEDY, F.R.S., M.I.C.E., University College, London:—

"There is no doubt that it is a most important practical advantage of the 'Griffin' type of Engine, that it can be made to accommodate itself to variations of resistance not only without alteration of mean speed, but also without alteration in the number of explosions per minute, and therefore, without any alteration of steadiness."

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Friday, July 17, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, JULY 24, 1891.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correr spondence will not usually permit our inserting lengthy communications.

CONTRACTS OPEN.

ACTON.—July 28.—For Making-up-Roads. Mr. D. J. Ebbetts, Local Board Offices, Acton.

ALFRETON.—Aug. 3.—For Building Small Villa. Mr. William Watson, Victoria Buildings, Alfreton.

BANTRY.—For Improvements to Provincial Bank. Mr. W. H. Hill, Architect, 15 Marlborough Street, Cork.

BARNSLEY.—Aug. 3.—For Building Glass-house and Warehouse at Stairfoot. Mr. J. P. Kay, Architect, 30 Park Square, Leeds.

BATTERSEA.—July 27.—For Providing and Erecting Wrought-iron Gates and Railings. Mr. T. H. Bishop, St. Mary's Cemetery, Battersea, S.W.

BIRMINGHAM.—For Building Block of Houses and Shops. Mr. F. J. Yates, Architect, 88 Colmore Row, Birmingham.

BIRMINGHAM.—July 27.—For Erection of Pig Market, with Lodge, Offices, Water Bridge, &c. Mr. William S. Till, City Surveyor's Office, Birmingham.

BOLDON COLLIERY.—July 25.—For Building Miners' Hall. Mr. J. H. Morton, Architect, South Shields.

BRADFORD.—July 29.—For Altering Warehouse. Mr. Jas. Ledingham, Architect, District Bank Chambers, Bradford.

BRADFORD.—July 27.—For Erection of Buildings in connection with Thornton Joint Hospital. Messrs. W. & J. B. Bailey, Architects, 9 Market Street, Bradford.

BRAMPTON.—July 28.—For Classrooms, &c., to School. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

BRIGHTON.—July 31.—For Supplying and Fixing Iron Fences, Gates, &c. Mr. F. J. C. May, Town Hall, Brighton.

BRIXTON.—July 24.—For Erection of Postmen's Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

BURY ST. EDMUNDS.—July 27.—For Erecting Police Station, Prison Cells and Superintendent's House. Mr. Frank Whitmore, County Surveyor, Chelmsford.

CAERLEON.—July 29.—For Building Villa. Mr. George Rosser, Architect, 20 High Street, Newport, Mon.

CARDIFF.—For Building Methodist Schoolroom, Splotlands. Messrs. W. G. Habershon & Fawckner, Architects, Pearl Street, Cardiff.

CARLISLE.—July 29.—For Additional Block of Piggeries at Asylum, Garlands. Mr. C. J. Ferguson, F.S.A., The Courts, Carlisle.

CARN BREA.—Aug. 13.—For a 90-inch Cylinder Cornish Pumping Engine, Steam Capstan, Four Cornish Boilers and Fittings. Mr. Nicholas Trestrail, Engineer, Claremont Road, Redruth.

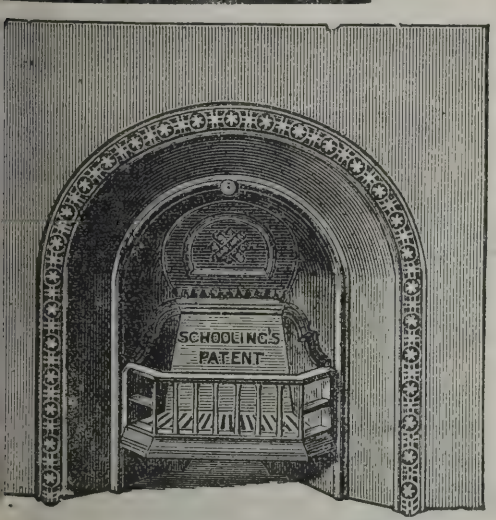
CORNWALL.—Aug. 11.—For Building Branch Bank and Manager's Residence at Helston, also at St. Colomb. Mr. Silvanus Trevail, Architect, 80 Lemon Street, Truro.

DALTON-IN-FURNESS.—July 30.—For Erection of Co-operative Buildings. Mr. J. V. McIntosh, Architect, Cornwallis Street, Barrow.

DEARHAM.—July 30.—For Building Dwelling-house. Mr. Thomas Glaister, Brow House, Dearham, Cumberland.

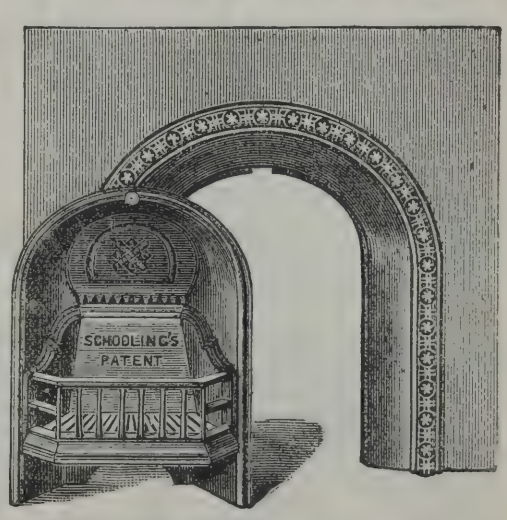
DEVONPORT.—July 31.—For Painting Work. W. H. Rathborne, Commanding Royal Engineer, R.E. Office, Devonport.

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FERRYHILL.—Aug. 5.—For Building Twenty-four Houses, North-Eastern Railway. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

FOLESHILL.—Aug. 10.—For Erecting Schools. Mr. T. F. Ticknor, 7 Bishop Street, Coventry.

GAINSBOROUGH.—Aug. 6.—For Building Market House, Corn Exchange, &c. Mr. D. G. Macdonald, Surveyor, Lord Street, Gainsborough.

GOOLE.—July 28.—For Building Goods Offices. Plans at the Architect's Office, Hunt's Bank, Manchester.

HERTFORD.—Aug. 5.—For Erecting Hall and Sunday School Rooms. Mr. James Farley, Architect, Old Cross, Hertford.

HORSFORTH.—July 31.—For Building Six Houses. Mr. J. P. Kay, Architect, 30 Park Square, Leeds.

HUDDERSFIELD.—July 27.—For Refuse-destructor Sheds. The Borough Surveyor.

HUDDERSFIELD.—July 31.—For Tall Chimney and Additions to Confectionery Works. Messrs. John Kirk & Sons, Architects, Huddersfield.

HUDDERSFIELD.—July 30.—For Building Six Houses, Moldgreen. Mr. J. Berry, Architect, 9 Queen Street, Huddersfield.

INDIA.—July 28.—For Supply of Iron Roofing. Sir George B. Bruce, 3 Victoria Street, Westminster, S.W.

ISLINGTON.—July 24.—For Ventilation, Painting and Decorating Vestry Hall, and Construction of Strong Rooms. Mr. J. Patten Barber, Vestry Hall, Upper Street, Islington, N.

KETTERING.—July 27.—For Building Board Schools, Out-offices, &c. Mr. H. A. Cooper, Architect, 16 Market Place, Kettering.

LEDBURY.—July 29.—For Rebuilding Fair Tree Bridge. Mr. J. F. Symonds, Clerk to the County Council, Shire Hall, Hereford.

LEEDS.—Aug. 8.—For Building Weights and Measures Office, Kirkgate Market. The Borough Engineer.

LEWES.—Aug. 22.—For Supply of Broken Granite. Mr. Arthur Holt, Town Hall, Lewes.

LIMERICK.—Aug. 1.—For Restoring South Aisle, Chapels, Towers, &c., St. Mary's Cathedral. Mr. R. Fogerty, Architect, Henry Street, Limerick.

LONDON.—For Pulling-down Houses. Mr. Frank Matcham, 3, Great James Street, W.C.

LONDON.—July 29.—For Erecting Wards, Dining-hall, &c., at St. Luke's Workhouse. Mr. H. Saxon Snell, 22 Southampton Buildings, W.C.

MOUNTAIN ASH.—July 24.—For Erection of Business Premises and Dwelling-houses. Secretary, Co-operative Society, Cwmbach, near Aberdare.

MOUNTAIN ASH.—July 24.—For Building Extensive Business Premises and Two Houses. Mr. M. Morgan, Maesyderwen, Mountain Ash.

NELSON.—July 30.—For Supply of Cast-iron Pipes. Mr. R. M. Prescott, Town Clerk, Nelson.

NEWCASTLE-UNDER-LYME.—For Extension of Workhouse. Mr. John Blood, Architect, Guardian Chambers, Newcastle-under-Lyme.

NEWPORT.—July 28.—For Additions, &c., to Blackwood School. Mr. W. G. Griffiths, Architect, High Street, Newport, Mon.

NEWPORT.—Aug. 17.—For Construction of Brick and Pipe Sewers. Mr. F. W. B. Waterworth, Town Hall, Newport, Isle of Wight.

NEWTON ABBOT.—July 29.—For Extension of Chancel and South Aisle of Highweek Church. Messrs. Fulford, Tait & Harvey, Architects, Cathedral Yard, Exeter.

PLYMOUTH.—July 29.—For Construction of Filter Beds at Antony. Mr. Inglis, Engineer, 1 Buckland Street, Plymouth.

PONTYPRIDD.—July 27.—For Alteration to Premises. Mr. F. Gibson, Architect, 29 Market Square, Pontypridd.

RADCLIFFE.—July 27.—For Building Stables, Loose Boxes, Harness-room, Dairy, &c. Mr. James Sellers, Architect, Union Chambers, Bury.

RICHMOND.—Aug. 4.—For Erection of Municipal Buildings. Mr. W. J. Ancell, 3 Staple Inn, London.

ROCHDALE.—For Alterations to Robin Hood Hotel. Mr. George A. Hammond, Architect, 305 Manchester Road, Rochdale.

ROMFORD.—Aug. 6.—For Supplying and Laying Norwegian Edge Kerb. Mr. A. H. Hunt, Local Board Offices, Romford.

SHEFFIELD.—July 27.—For Construction of an Inner Lining to Gasholder Tank. Mr. F. W. Stevenson, Sheffield Gas Co., Commercial Street, Sheffield.

SHEFFIELD.—For Building Wesleyan Schools. Mr. E. Winder, jun., Architect, Wharf Street, Sheffield.

FIRE! FIRE! FIRE!

ARCHITECTS

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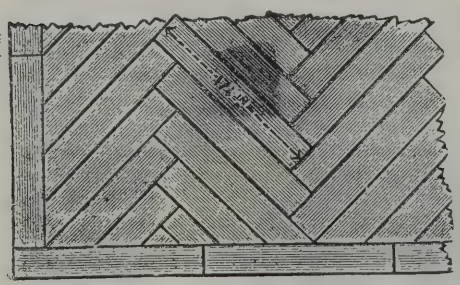
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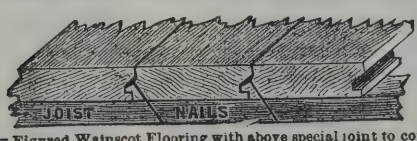
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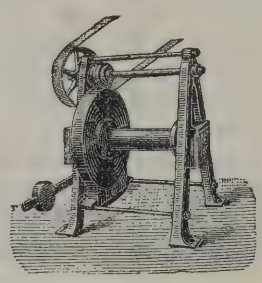
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The Tivoli Theatre
Junior United & other Clubs
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SOUTH ACTON.—For Building Laundry and Residences. Mr. F. T. W. Miller, Architect, 21 The Avenue, Bedford Park.

SOUTHAMPTON.—July 27.—For Alterations and Additions to Board School. Mr. E. T. Howell, Architect, Portland Street, Southampton.

STOCKPORT.—July 31.—For Building Infant Schools. Mr. W. Wright, Surveyor, Lancaster.

STORNOWAY.—Aug. 22.—For Construction of Concrete Breakwater and Harbour Improvements, Port Ness. Messrs. D. & T. Stevenson, Engineers, 84 George Street, Edinburgh.

STRATFORD.—July 28.—For Pulling-down and Removing House. Mr. Lewis Angell, Town Hall, Stratford, E.

STRATFORD.—July 31.—For Erecting Printing Works. Mr. T. D. Genlloud, Secretary, Liverpool Street Station, E.C.

TAUNTON.—Aug. 4.—For Building Engine-house, &c., at Sewage Outfall Works, Supplying Pumps, Gearing, &c. The Borough Surveyor.

WAKEFIELD.—July 27.—For Alterations at Eastmoor Board Schools. Mr. William Watson, Architect, Barstow Square, Wakefield.

WAKEFIELD.—Aug. 7.—For Constructing Sewers. Mr. Frank Massey, Tetley House, Kirkgate, Wakefield.

WALTHAMSTOW.—July 24.—For Construction of Sewers Mr. G. W. Holmes, Town Hall, Walthamstow.

WHEATLEY.—Aug. 3.—For Pulling Down and Rebuilding Sunday School. Mr. James Farrar, Architect, 29 Northgate, Halifax.

WOODFORD.—Aug. 8.—For Supply of Broken Granite. Mr. J. D. Hooper, Local Board Offices, Woodford Green, Essex.

WORCESTER.—July 25.—For Laying Pipe Drains, Kerbing and Channelling. Mr. J. H. Garrett, County Hall, Worcester.

WORSBOROUGH BRIDGE.—July 30.—For Building Wesleyan Chapel. Mr. John Whitaker, Saville House, Worsborough, Barnsley.

YSTRAD RHONDDA.—Aug. 3.—For Building Thirty Cottages. Mr. J. Rees, Architect, Pentre.

YSTRADYFODWG.—July 31.—For Constructing Main Outfall Sewers. Mr. H. Walter Morgan, Local Board Offices, Pentre Rhondda, near Pontypridd.

TENDERS.

ABERDEEN.

For Removal of Canteen Buildings and Boundary Walls and Erection of New Canteen and Boundary Wall, &c. Mr. W. BOULTON, Burgh Surveyor, Aberdeen.

D. Macandrew & Co., Aberdeen	£1,760 0 0

BALDERSTONE.

For Alterations at St. Leonard's Church, Balderstone. Messrs. STONES & GRADWELL, Architects, 10 Richmond Terrace, Blackburn.

Israel Simm, Balderstone.

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For Pulling-down and Rebuilding Retort-house, Engine-house, &c., at the Gasworks, Bangor, for the Water and Gas Committee.

T. Owen, Bangor	£1,996 0 0
W. Jones, Bangor	1,890 0 0
W. O. DANIEL, Upper Bangor (*accepted*)	1,800 0 0

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For Alterations and Additions to Bungalow at Furzefield Chase, Bellaggio, Surrey, for Mr. W. Stopher. Mr. WALTER J. EBBETTS, F.R.I.B.A., Architect, Savoy House, 115 Strand.

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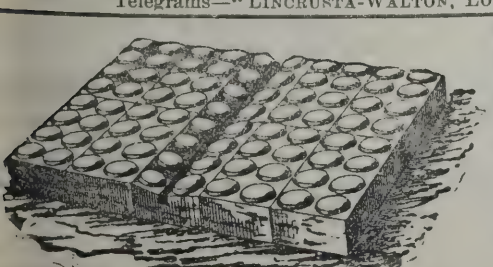
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W. Thomas, Cardiff	13,540 0 0	—
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D. Davies, Cardiff	12,740 0 0	—
J. Hopkins, Cardiff	12,700 0 0	—
W. Symonds, Cardiff	12,572 10 0	—
T. Gough, Cardiff	12,474 0 0	£10,256 1 8
Turner & Sons, Cardiff	12,078 0 0	10,167 0 0
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Surveyor's estimate	1,282 0 0

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G. Smith, Wednesbury	238 0 0
W. Willetts, Old Hill	223 0 0
J. Davis, Dudley	218 16 0
J. Jeavons, Dudley	215 0 0
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Surveyor's estimate	230 0 0

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G. Walker, Leeds	627 10 1
Slinger & Naylor, Scholes	615 0 0
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J. Godwin, Hanley	2,900 0 0
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G. Ellis, Hanley	2,851 10 0
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E. Hindle, Horbury	3,045 10 0
J. Dews, Ossett	2,987 4 6
G. Walker, Leeds	2,917 16 9
S. Ross, Bradford	2,900 0 0
J. Speight, Keighley	2,877 17 6
T. & G. Wilson, Wakefield	2,862 6 3
J. Pickersgill, Ossett	2,760 0 0
W. Godley, Ossett	2,670 0 0
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J. Zealley, Newton Abbot	97 0 0
S. Pack, Torre	96 10 0

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George Buch, Southsea	1,465 0 0
C. Brown, Southsea	1,428 6 0
Thomas Francis, Southsea	1,384 10 0
W. R. Light, Landport	1,337 0 0
T. P. HALL, Southsea (*accepted*)	1,166 0 0

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E. Lawrance	7,170 0 0
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WILLIAM SHEPHERD (*accepted*)	6,552 0 0

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For Sanitary Alterations, &c., at Prince of Wales Road, Kentish Town, for Mr. F. W. Rowney. Mr. WALTER J. EBBETTS, F.R.I.B.A., Surveyor, Savoy House, 115 Strand.

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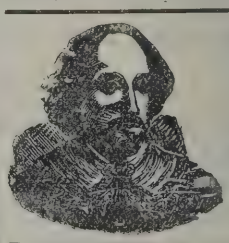


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LONDON—*continued.*

For Building Orphanage, Brook Green, Hammersmith. Mr. JOHN G. HALL, Architect.

JOSEPH BROWN & SON (*accepted*)	£7,200 0 0

For Alterations at the King's Head, Bow Road. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within.

Edwards & Medway	£1,420 0 0
Todd	1,347 0 0
Walker Bros.	1,293 0 0
Courtney & Fairbairn	1,252 0 0

For Alterations at the Wheatsheaf Tavern, Goldhawk Road, Shepherd's Bush. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within.

Voller	£2,645 0 0
Todd	2,615 0 0
Edwards & Medway	2,588 0 0
Courtney & Fairbairn	2,505 0 0
Spencer & Co.	2,320 0 0
Davies	2,047 0 0
Pewtering and Counter.	
HEATH (*accepted*)	244 0 0
Gasfittings.	
WINN (*accepted*)	209 0 0

For Alterations at the North London Hotel, Brondesbury. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within.

Voller	£935 0 0
Courtney & Fairbairn	915 0 0
Goodall	820 0 0
Todd	797 0 0

For Alterations at the Morpeth Castle Tavern, Cadogan Terrace, Victoria Park. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within.

Goodall	£865 0 0
Todd	829 0 0
Courtney & Fairbairn	803 0 0
Walker Bros.	753 0 0
Edwards & Medway	717 0 0
Pewtering.	
Heath	114 0 0
Thomson	106 0 0
Gasfittings.	
STEADMAN (*accepted*).	

LONDON—*continued.*

For Alterations at the Union Tavern, Great Portland Street. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within.

Davies	£205 0 0
Courtney & Fairbairn	195 0 0
Lundy	186 0 0
Lister	185 10 0
Clarke & Mannoch	179 0 0
Saunders	160 0 0
Gasfittings.	
WINN (*accepted*).	

For Rebuilding No. 7 Fenchurch Street, for Mr. C. J. Knowles. Mr. E. B. ELLIS, Architect. Quantities by Messrs. Campbell & Son.

Greenwood	£11,340 0 0
Grover & Son	11,266 0 0
Chappell	11,164 0 0
Colls & Sons	10,995 0 0
Perry & Co.	10,977 0 0
Ashby & Horner	10,966 0 0
B. E. NIGHTINGALE (*accepted*)	10,588 0 0

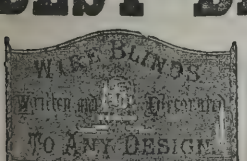
For Modernising the Surrey Tavern, Wandsworth Common, for Mr. J. T. Bonner. Mr. DEAR, M.S.A., Architect, 117 Great Russell Street, Bloomsbury. Quantities by Mr. J. Leaning, 11 Poultry.

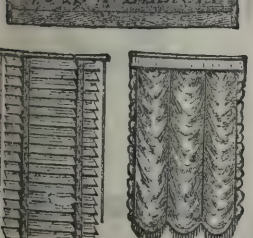
Burman & Sons	£1,170 0 0
Gould & Brand	1,050 0 0
Drew & Cadman	1,030 0 0
Sharpe	990 0 0
Lascelles	940 0 0

For Alterations and Additions to the Crouch End Schools, for the Hornsey School Board. Mr. T. CHATFEILD CLARKE, Architect. Quantities by Messrs. Leonard & Clark.

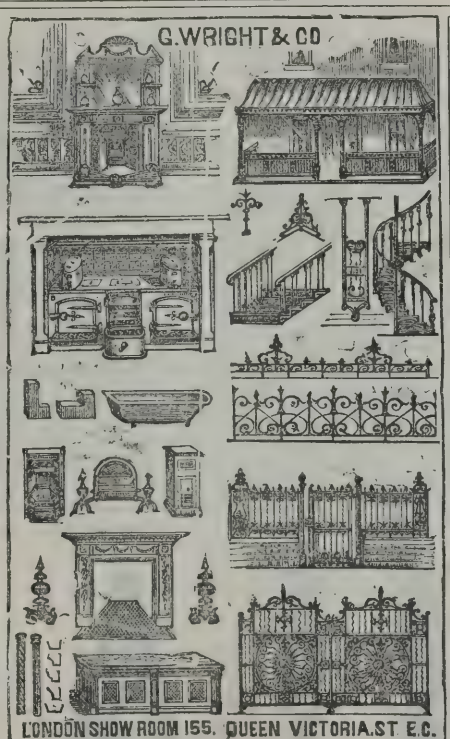
Woodward	£1,540 0 0
Kilby & Gayford	1,495 0 0
Scrivener & Co.	1,451 0 0
Lawrence & Son	1,431 0 0
Mattock Bros.	1,423 0 0
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Houghton & Son	1,169 0 0
B. E. Nightingale	1,116 0 0
Ashby Bros.	1,083 0 0

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175 STRAND, W.C.

LONDON—*continued.*

For Building Four Houses, Coborn Road, Mile End. Messrs. HAMMACK & LAMBERT, Architects.

F. & F. J. Wood	£1,897 0 0

For Painting, &c., at the Central Poultry and Provision Market, Smithfield, for the Corporation of the City of London. Mr. A. MURRAY, Architect.

Anderson	£8,730 0 0
Heeps	5,460 0 0
Lister	4,970 0 0
Mason	4,944 0 0
Harrison & Spooner	4,647 0 0
B. E. Nightingale	4,576 0 0
Taylor	4,387 0 0
McCormack	4,342 0 0
Wilmot	3,352 0 0

For Building Junior Mixed Department to accommodate 288 Children, and Cookery Centre, Mantua Street, Battersea. Mr. T. J. BAILEY, Architect.

		Tar Pavement and Drainage for Existing School.
Foster & Dicksee	£6,467 0 0	£451 0 0
Lathey Bros.	6,367 0 0	552 0 0
J. W. Hobbs & Co., Limited	6,032 0 0	500 0 0
W. H. Lorden & Son	5,987 0 0	519 0 0
Hart Bros.	5,944 0 0	508 0 0
J. T. Chappell	5,762 0 0	480 0 0
Holloway Bros.	5,631 0 0	463 0 0
J. Tyerman	5,601 0 0	485 0 0

For Alterations and Repairs at the City of London Schools, Victoria Embankment, for the Corporation of the City of London. Mr. A. MURRAY, Architect. Quantities by Messrs. Franklin & Andrews.

Gentry	£3,686 0 0
B. E. Nightingale	3,505 0 0
Philps & Bisiker	3,339 0 0
Lamble	3,276 0 0
Ledstone	3,145 0 0
Chappell	2,829 0 0
Lang	2,725 0 0
Mowlem	2,713 0 0
Lark	2,589 0 0
Holliday & Greenwood	2,535 0 0
Harrison & Spooner	2,487 0 0

LONDON—*continued.*

For Supplying Boilers to Heating Apparatus of various Board Schools.

Mansford Street, Bethnal Green.

Smeaton, Son & Co.	£107 0 0
Comyn Ching & Co.	105 0 0
Green & Son, Limited	98 0 0
G. Davis	93 0 0

King and Queen Street, Walworth.

Potter & Sons, Limited	105 0 0
Smeaton, Son & Co.	104 10 0
Green & Son, Limited	95 0 0
J. & F. May	95 0 0
G. Davis	90 0 0

Everington Street, Hammersmith.

Rosser & Russell	205 0 0
Comyn Ching & Co.	198 0 0
Kinnell & Co.	176 10 0

Tower Street.

Smeaton, Son & Co.	95 0 0
Comyn Ching & Co.	94 0 0
Green & Son, Limited	93 0 0

For Reinstating Upper Storey and Roof at No. 62 Gray's Inn Road, for Mr. T. Sage. Mr. W. GRAVES, Architect.

B. E. Nightingale	£362 0 0
Bowyer	358 0 0
Lawtence & Sons	321 0 0
Pitman & Son	312 0 0

For Alterations and Additions to Dowgate Wharf, for Mr. C. Poulter. Mr. E. A. CROCKETT, Architect.

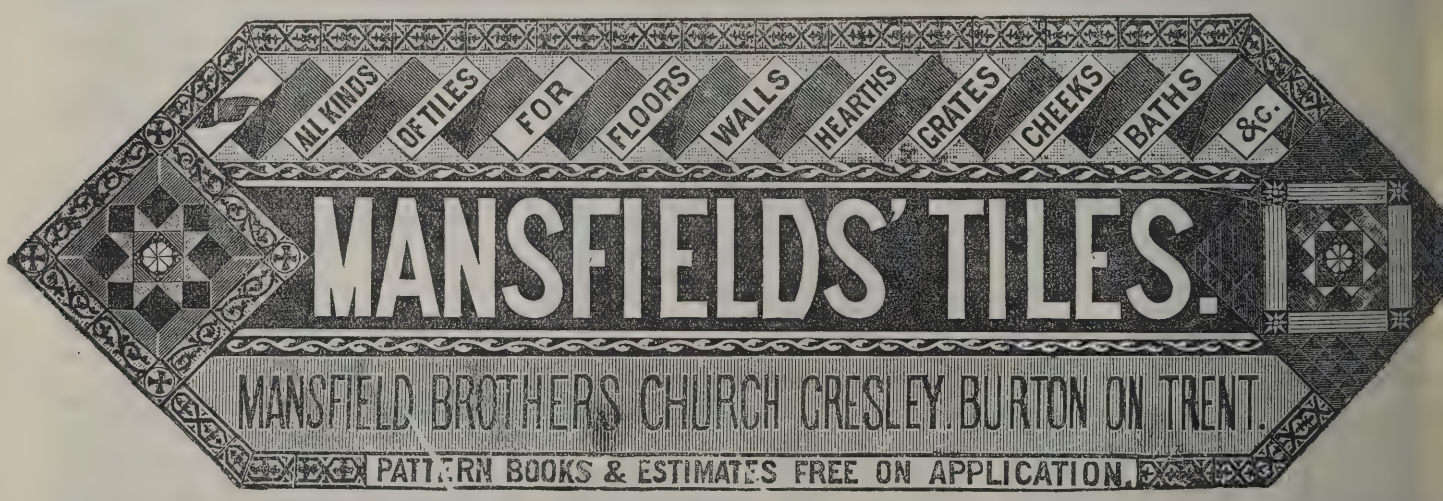
Greenwood	£1,999 0 0
B. E. Nightingale	1,899 0 0
Ashby & Horner	1,884 0 0
Outhwaite	1,820 0 0

For Alterations at the George Tavern, Commercial Road, East. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within.

SPENCER & CO. (*accepted*)	£2,370 0 0

For Pulling Down and Rebuilding the Jolly Gardeners' Tavern, Prince's Road, Lambeth. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within.

F. VOLLER (*accepted*)	£5,447 0 0

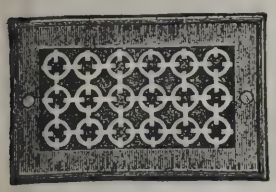


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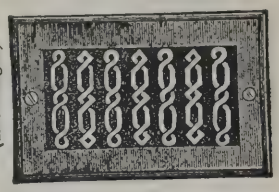
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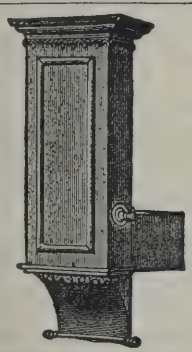
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"	16	"	6 to 8 "	2	12	6	"	27 "	12 to 14 "	6	7	6	"	48 "	18 to 24 "	16	15	0
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LONDON—*continued.*

For Repairs, &c., to 177 and 179 Lordship Lane, East Dulwich. Messrs. WALKER & RÜNTZ, Architects.

Barrett & Power	£688 0 0
B. E. Nightingale	594 0 0
Hughes	589 6 0

NEWCASTLE-UNDER-LYME.

For Alterations to Lloyds Bank, Newcastle-under-Lyme. Messrs. R. SCRIVENER & SONS, Architects, &c., Hanley.

H. & R. Inskip, Longton	£1,550 0 0
Rose Vale Brick and Tile Co., Chesterton	1,493 0 0
J. Gallimore, Newcastle	1,460 0 0
J. Godwin, Hanley	1,433 0 0
G. ELLIS, Hanley (*accepted*)	1,220 0 0
W. Cooke, Burslem	1,200 0 0

NORWICH.

For New Barley Store, Norwich, for Messrs. Lacon & Co. Messrs. BOTTLE & OLLEY, Architects, Great Yarmouth.

J. Downing & Sons, Norwich	£1,196 0 0
W. Cork, Great Yarmouth	1,099 0 0
J. S. Smith, Norwich	1,032 0 0
G. E. Hawes, Norwich	1,025 0 0
Youngs & Son, Norwich	975 0 0
H. LACEY, Norwich (*accepted*)	955 0 0

Exclusive of piling for foundations.

PETERBOROUGH.

For Building Dwelling-house, Out Offices, &c., Cromwell Road. Mr. J. G. STALLEBRASS, Architect, Peterborough.

Spencer, Peterborough	£272 0 0
Guttridge, Peterborough	269 0 0
Sibley, Peterborough	266 0 0
Wenlock, Peterborough	260 10 0
Wright, Peterborough	260 0 0
Hawkins, Peterborough	260 0 0
Noble, Peterborough	256 10 0
Gray, Peterborough	256 0 0
Nichols, Peterborough	255 0 0
BAILEY, Peterborough (*accepted*)	248 0 0

RINGWOOD.

For Repairs to Roof of Parish Church, Ringwood, Hants.

F. A. Ayles	£250 0 0
W. E. ALEXANDER (*accepted*)	222 0 0

RUSHDEN.

For Oak Seating for Rushden Parish Church. Messrs. TALBOT-BROWN & FISHER, Architects, Wellingborough.

W. Stevens, Wellingborough	£167 0 0
W. Wade, St. Neots	142 0 0
F. Miller, Rushden	135 0 0
T. LIONDALL, Rushden (*accepted*)	116 10 0

SOUTHAMPTON.

For Proposed Shop and Warehouse, for Mr. S. M. Silverman, Anglesea Place, Above Bar, Southampton. Mr. W. BURROUGH HILL, F.S.I., Architect, Southampton.

J. Crook & Son	£2,287 10 0
C. B. Jordan	2,190 0 0
H. J. Sanders	2,183 0 0
E. Sandon	2,096 0 0
Stevens & Co.	1,892 0 0
Morgan, Isted & Morgan	1,886 0 0

SWINDON.

For Construction of Settling-tanks, Mixing-house, Carriers, &c., at the Sewerage Farm, New Swindon, for the Swindon New Town Local Board. Mr. H. J. HAMP, Surveyor, Faringdon Street, New Swindon.

L. Lloyd, Ipswich	£3,495 0 0
A. Coe, Ipswich	3,295 0 0
W. Coker, Lymington	3,008 0 0
F. Reeks, Lymington	2,893 0 0
G. Wiltshire, Swindon	2,760 0 0
J. WILLIAMS, Swindon (*accepted*)	2,272 17 0
Surveyor's estimate	2,400 0 0

For Pulling-down and Rebuilding the Running Horse Inn, Wootton Bassett Road, Swindon. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

J. WILLIAMS, Swindon (*accepted*).

For Additions to the King's Head Tavern, Fleet Street, New Swindon. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

G. WILTSHIRE, Swindon (*accepted*).

For Alterations, Repairs and Decorator's Work, &c., at the Bakers' Arms Inn, Market Place, New Swindon. Mr. WILLIAM DREW, M.S.A., Architect.

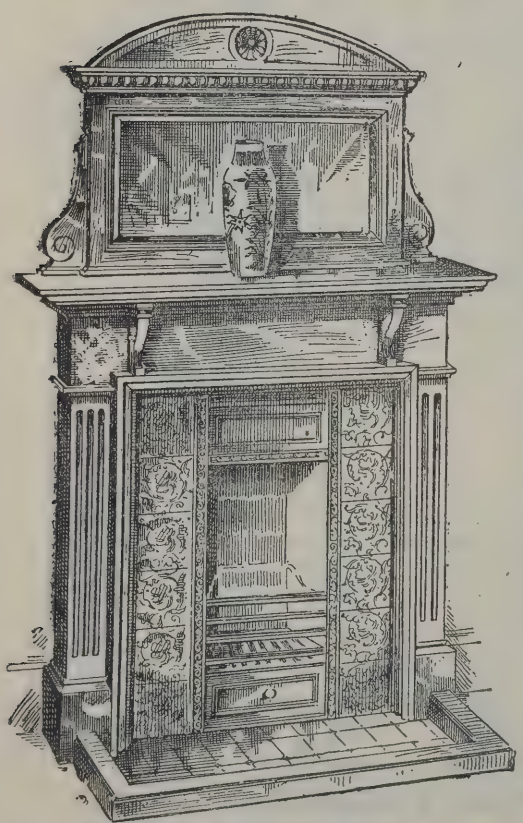
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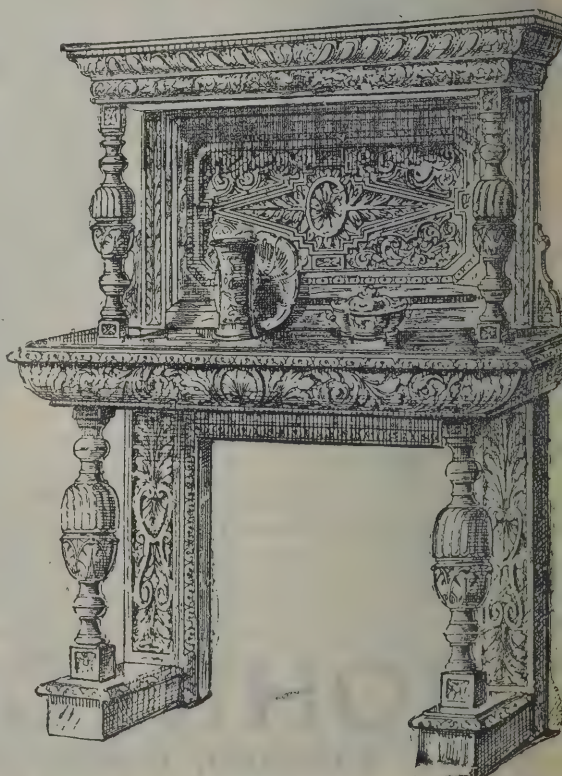
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For New Bank, Southwold, Suffolk, for Messrs. Gurneys & Co. Messrs. BOTTLE & OLLEY, Architects, Great Yarmouth.

R. J. ALLEN, Southwold (*accepted*)	£720 0 0

THORPE.

For Building Residence for Medical Superintendent, County Asylum, Thorpe. Mr. T. H. B. HESLOP, C.E., County Surveyor, Norwich. Quantities supplied.

Hall, Norwich	£1,990 0 0
Brett & Son, Harleston	1,980 7 0
Wilkins, Norwich	1,975 0 0
Evans, Norwich	1,938 0 0
BLYTH, Foulsham (*accepted*)	1,900 0 0

TILBURY.

For Building a School for 400 Children, for the Chadwell St. Mary School Board. Mr. HORACE T. BONNER, A.R.I.B.A., Architect, 29 & 30 King Street, Cheapside.

Reed, Blight & Co., Plymouth	£3,833 0 0
W. White, Grays	3,398 0 0
B. E. Nightingale, London	3,285 0 0
I. & M. Patrick, Chatham	3,180 0 0
Webb, Stratford	3,050 0 0
Carter, Grays	3,011 11 0
H. Fagg, London	2,957 0 0
C. Robson, Lewisham	2,850 0 0
T. W. TRAPPIT, Beddington *	2,764 10 0

	Playsheds.	Iron Fence.
Webb	£115 0 0	30 0 0
Reed, Blight & Co.	110 0 0	28 0 0
W. White	110 0 0	32 10 0
Carter	110 0 0	43 0 0
C. Robson	110 0 0	25 10 0
T. W. TRAPPIT *	107 10 0	21 16 8
B. E. Nightingale	105 0 0	52 0 0
I. & M. Patrick	105 0 0	12 14 0
H. Fagg	100 0 0	43 0 0

* Accepted subject to the approval of the Educational Department.

WATFORD.

For Alterations and Additions to Sanitary Works, at the London Orphan Asylum, Watford. Mr. WALTER J. EBBETTS, F.R.I.B.A., Surveyor, Savoy House, 115 Strand.

GEO. JENNINGS (*accepted*)	£490 0 0

WOOLWICH.

For Rebuilding Nos. 90 to 98 Powis Street, Woolwich, for Messrs. Cuff & Co. Mr. H. H. CHURCH, Architect.

Holloway Bros.	£5,500 0 0
B. E. Nightingale	5,497 0 0
Multon & Wallis	5,390 0 0
Kirk & Randall	5,350 0 0
Allen & Son	5,225 0 0
H. L. Holloway	5,173 0 0
J. Chapman	4,896 0 0

TRADE NOTES.

THE vestry hall of St. Martin's has been opened. Mr. C. H. Mabey executed the general carving on the building, and also the bas-relief panel at top—St. Martin and the Beggar.

ON Sunday last a new clock was started by the donor, Mrs. John Ashworth, in the tower of Astley Bridge Church, Bolton. It strikes the hours, chimes the Westminster quarters, and shows time on three dials. It will prove a great boon to the inhabitants, and will form a standard for the timekeeping of the neighbourhood. Messrs. John Smith & Sons, Midland Clockworks, Derby, carried out the work, and they have also just completed a large clock on the Victoria Pier, Douglas, Isle of Man.

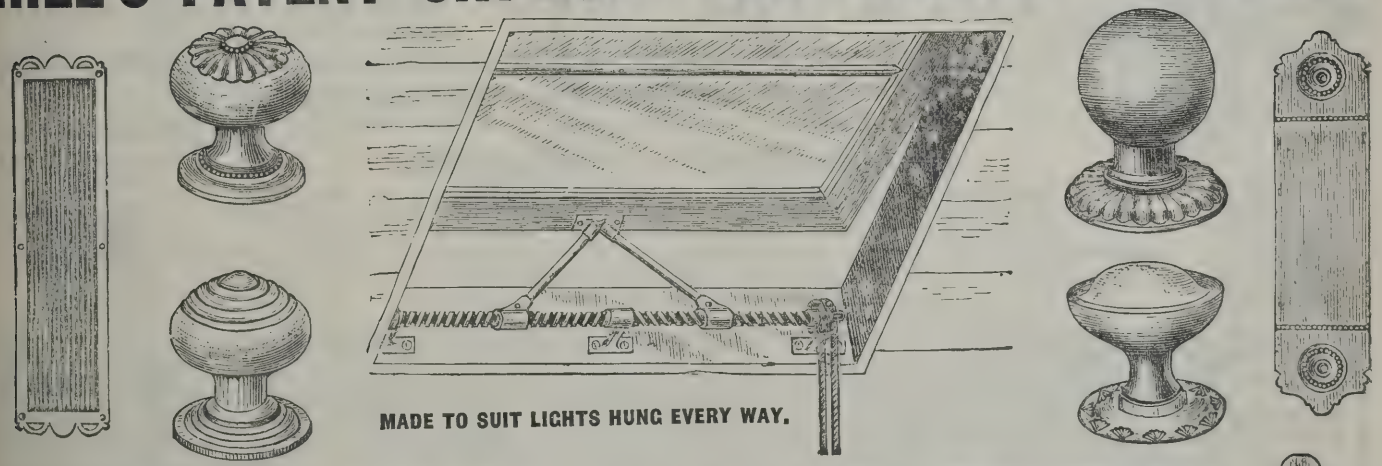
THE Cottage Hospital, Gartnavel, Glasgow, is being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

THE Local Government Board have given their sanction to a scheme for the water supply of Oundle, prepared by Mr. W. H. Radford, C.E., of Nottingham. The decision as to the sewerage scheme is expected shortly.

ON and after August 1 the premises of Messrs. C. & R. Light, wholesale cabinet and looking-glass manufacturers, Curtain Road, will close at two o'clock on Saturdays.

THE Manchester New College was commenced some weeks ago, and is now well in hand, Messrs. Worthington & Elgood being the architects. The whole of the fireproof floors are to be constructed on Fawcett's system. Quite recently, at Lincoln, by invitation of Mr. W. Mortimer, architect, a party, including architects and members of the Corporation, had an opportunity of inspecting this system of fireproof flooring in

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the warehouse in course of erection for Messrs. Doughty, Son & Richardson. Mr. Mark Fawcett, who is a native of Lincoln, was present and explained the system.

THE Birmingham Corporation have just ordered a new fire-escape capable of extension to 70 feet in height, for use by the Fire Brigade in connection with the lofty buildings in the centre of the city. The escape will be constructed by Messrs. Shand, Mason & Co., of London, on their patent "lattice girder" principle. A similar escape, 60 feet in height, has also been ordered for Leith, to replace one destroyed at the recent disastrous warehouse fire. Another 60-feet escape was recently supplied to Derby, and when publicly tested gave great satisfaction. Thirty seconds suffice for its extension to the full height by two men.

EXTENSIVE additions and alterations have been made to schools for the East Ham School Board, and the most careful consideration has been given to the ventilation, which has been entrusted to the "Climax" Ventilating Company, of 15 Great George Street, Westminster, whose appliances, both for admission and extraction, are adopted throughout.

THE tender of Mr. Thomas Coates, Durham, has been accepted for the execution of works required at the Government buildings in Durham.

THE committee of the Bolton Technical School, after special inquiries and investigation into the various gas-engines in the market, have decided to accept the estimate of Messrs. Dick, Kerr & Co., Limited, of Kilmarnock and London, the makers of the "Griffin" double-acting gas-engines. This is the best type of a double-acting engine, and is particularly steady in running. There is an explosion at every revolution and a half, first on one side of the piston and then on the other, insuring great regularity. It is of the greatest importance to have the steady running, especially for electric lighting, and the consumption of gas in these engines is as small as in the best single-acting engines. Two engines are required, each to indicate thirty-five horse-power. One will be used to work the machinery and the other the electric lighting, but they will be so arranged as to be worked separately for either purpose, so that any accident to either engine would not completely stop any part of the work of the school. In addition to the large engines a three horse-power engine will be provided and serve as a starting-engine for the large ones, and also will be available for use when it is required to run only a small portion of the machinery. This will enable students to use some of the machinery for special purposes without the necessity of running the large engines.

AT the meeting of the Eccles Local Board, it was resolved to take advantage of the power given them by Parliament (in connection with the Salford Gasworks Extension Bill) to promote a Bill next session for establishing separate gasworks for the supply of the district jointly with Swinton and Pendlebury. It is said that if the scheme is carried out, the Salford Corporation will claim 200,000*l.* compensation for loss of custom and value of gas mains in the joint districts.

WITH a view to alterations which it is intended to carry out in the Glasgow Sheriff Court-House, committees of the Court-house Commissioners and the Faculty of Procurators have held a meeting to discuss a scheme which would give satisfaction to law agents and litigants. A satisfactory arrangement, it is expected, will involve the reconstruction of the courts and sheriffs' rooms.

VARIETIES.

IN consequence of the successful termination of a negotiation by which the "Theodora" Company has acquired the option of a long lease of the New Olympic Theatre, Mr. W. W. Kelly, the manager, has decided to abandon his intention of opening the Globe Theatre next Thursday for a tentative season, and has arranged to revive "Theodora," with Grace Hawthorne in the title *rôle*, at the New Olympic Theatre, on Saturday, August 1 next.

AT the annual meeting of the Paisley Town Council as the Gas Corporation, the financial statement for the year ending May 28 was submitted. The gross revenue for the year amounted to 39,120*l.* 19*s.* 10*d.*, and the gross expenditure to 27,799*l.* 18*s.* 3*d.*, which left a balance of profit and loss to the extent of 11,321*l.* 1*s.* 7*d.* After setting aside 3,082*l.* 5*s.* 11*d.* for interest on mortgages, &c., and also for sinking fund, there was left a net surplus of 8,238*l.* 15*s.* 8*d.* It was proposed to reduce the price of gas from 2*s.* 10*d.* for 1,000 cubic feet to 2*s.* 8*d.*, in which case Paisley would have the cheapest gas in Scotland. It was decided, however, that the price should remain at 2*s.* 10*d.* to enable important and necessary improvements to be continued in the town as heretofore.

WITH the July number the *Art Decorator* has begun its third annual series. It contains "Emblems of Great Artists," viz. Dürer, Holbein, Michel Angelo, Raphael and Rubens;

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THE Lund Park, a new park at Keighley, named after Mr. James Lund, of Malsis Hall, who gave 15 acres of land to the town, has been opened.

THE site for the new general post office in Victoria Street, Liverpool, contains about 8,300 square yards, and is situated near the centre of the chief business part of the city. The greater portion of the site is unbuilt upon, the remainder being covered with buildings which are mostly unoccupied, leaving only a small part occupied by traders. It is believed that the cost of acquiring the site and erecting a suitable building will not exceed 400,000*l.*

PLANS have been submitted by Messrs. Browett, Lindley & Browett to the Eccles Local Board for the erection of new engine works at Higher Croft, Barton, near Manchester.

A MEETING has just been held of the Fife and Kinross Lunacy Board, at Cupar, when another discussion took place over the estimates for the proposed new hospital. The contractor's schedules had been carefully overhauled so as to cut down the cost to the lowest point. The result was a reduction on the previous estimates of 2,070*l.*, which brought down the net total to 20,630*l.* Lord Elgin pointed out the evils that would arise from delay and the impossibility of getting any further light on the question, as the whole subject had been fully discussed during the last fourteen months. He was also surprised at Mr. Welch's criticisms on the difference between the real and the probable estimates. Any one who had had any experience in building knew it to be invariably the case that the actual cost exceeded what was at first expected. It was decided to proceed with the building.

THE magnificent collection of classical antiquities from the site of the Temple of Diana, Nemi, Italy, presented to the Nottingham Castle Museum by Lord Savile, G.C.B., F.S.A., late H.M. ambassador at Rome, has been formally opened by the Mayor of the borough, in the presence of a distinguished company. In the absence of Lord Savile, through ill-health, he was represented by Mr. Felix Joseph, who, at the banquet which followed, responded for the toast of his health in very eulogistic terms, and commented on his many benefactions to the country.

A PROJECT is under consideration at Runcorn and Widnes to connect the two towns by the erection of a vehicular bridge over the Mersey. Sir Douglas Fox has drawn up a scheme for a bridge over the Mersey at a cost of 140,000*l.* It is proposed that the gradients on each side should be 1 in 30, and that the bridge should be constructed at an elevation of 75 feet above the high-water mark. This will be about 10 feet lower than the present railway and foot-bridge of the London and North-Western Railway.

AMERICAN NOTES.

THE Chicago *Journal of Commerce* says borers of the city artesian wells at Fort Worth, Tex., are of the opinion that the drill will soon penetrate a huge volume of boiling water, as the temperature increases with every few feet they go down, and at last accounts was 121 degrees at a depth of 2,900 feet.

IN excavating at Nimroud, the New York *Times* says, a number of drains were found covered over with pointed and elliptical arches, each layer being built slanting, so that it rests on the one immediately beneath it. This method of building renders a timber-centre or scaffolding unnecessary to support the stones until the keystone is in place.

THE current number of *Stone*, Indianapolis, contains an article on the sandstones of New York.

WHAT is said to be the first as well as the biggest tree that has ever been hauled on a railroad, is the trunk of a yellow fir-tree, weighing 90,000 pounds, to be exhibited at the World's Fair, Chicago. The tree as it stood in the forest in the Snoqualmie Valley, near the Cascade huts, and sixty miles east of Seattle, Wash., was 225 feet high and over 5 feet in diameter at its base. In the tree there are 23,000 feet of lumber, and from the rings at the butt it shows itself to be 441 years old. In the run from the West it has been exhibited at Tacoma, Portland and Omaha, and in spite of the immense tarpaulin which covers it it is chiselled, carved and marked with the names or initials of half the population of the West.

ACCORDING to *Stone*, Indianopolis, Mr. A. J. Gerstel, of Chicago, advocates granite paving for carriageways of that city. He says:—"I favour granite above everything else. Some people claim it is too smooth, and that dust arises from it, but you know that granite is everlasting, and that is what you want on our busy streets. I do not favour brick on a street where there is constant and heavy travel. Brick will not stand the



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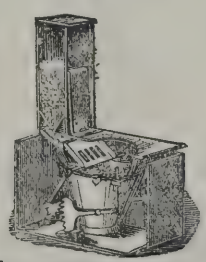
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wear. I see some people favoured asphalte for a time. That was an absurd idea. No responsible company would put in a plant to lay asphalte streets unless they were assured of fifteen or twenty miles of work. It costs not less than 5,000 dols. to establish such a plant, and no responsible company would put it in unless they saw work enough ahead to warrant it. If you want to see asphalte streets, go to St. Joseph, Mo. They had them. The company put in a plant and patched up the holes for two or three years. Then they packed up the plant and left. In European cities where asphalte is used extensively you will see barrels of pitch on all the streets, and men are constantly at work repairing breaks." Mr. Gerstel, or his informants, evidently have little acquaintance with asphalte carriageways out of America, as will be seen on reading the last sentence above.

THE Hudson River Tunnel has, the New York *Engineering News* says, about reached the lowest point in its total length of 5,500 feet. A 2 per cent. ascending gradient is now to be followed, and Messrs. A. Pearson & Sons, the contractors, have obtained from the War Department permission to cover the comparatively thin layer of silt, that would otherwise cover the tunnel roof, by a bed of well-tempered clay. The present depth of water at this low point is from 60 to 64 feet, and in some cases there are only 5 feet of river mud between the tunnel roof and the river bottom. As the air-pressure now used is about 25 lbs. per square inch, and this would have to be increased, it is evident that the shell of mud is not sufficiently thick to hold it. To go deeper into the river-bed means rock excavation, an exceedingly difficult and dangerous operation with the present plant. The Board of Engineers has granted the application on condition that not more than 20,000 cubic yards of clay be used in all, and that the clay bank nowhere rises more than 15 feet above the present bottom, nor anywhere above 31½ feet below low-water level in the river. This material must also be removed to the original depth on the completion of the tunnel. The company must also give a bond of 200,000 dols. for the faithful performance of their work under the above conditions, and pay for any damage to piers.

THE Census Bureau has issued statistics showing the extent and value of the limestone industry in the United States. The table of production shows that 19,095,179 dols. worth of ordinary limestone was produced during the census year from 1,954 quarries by a force of 30,644 men, to whom 10,121,985 dols. was paid in wages. The total expense of producing the limestone amounted to 15,092,714 dols., indicating a profit to the producers of over 4,000,000 dols. The capital invested amounts to 27,022,325 dols., of which 14,771,200 dols. is invested in land. The various purposes for which it is used is shown as follows :—

Building purposes	$5,405,671
Converted into lime	8,217,015
Stone for burning into lime	184,024
Flux for furnaces	1,569,312
Street work	2,383,456
Bridge, dam and railroad work	1,289,622
Miscellaneous uses	46,079

The figures are limited to lime manufactured by producers of limestone, and do not include lime produced by limeburners who purchase stone from quarrymen and burn it into lime. Limestone is produced in thirty-nine states and two territories, but nearly two-thirds of the product is confined to seven states. These seven states are Pennsylvania, Illinois, Indiana, Missouri, New York, Maine and Ohio, and the value of the product in each is in the order the states are named. Pennsylvania leads the list with 373 quarries and a production valued at 2,655,477 dols., as will be seen from the following table :—

Pennsylvania	373	$2,655,477
Illinois	104	2,190,607
Indiana	172	1,889,336
Missouri	123	1,859,960
New York	157	1,708,830
Maine	60	1,523,499
Ohio	221	1,514,934

These are the only States in which the value of the product reaches 1,000,000 dols. annually. In Wisconsin the value is 813,963 dols.; Minnesota, 613,247 dols.; Iowa, 530,863 dols.; California, 516,780 dols.; Kansas, 478,822 dols.; Alabama, 324,814 dols.; Kentucky, 303,314 dols. Maine heads the list in the value of lime produced, yet Pennsylvania produces more than twice the quantity produced in Maine. The Maine product comes entirely from Knox county, where large quarries of very pure limestone are operated exclusively for conversion into lime. Pennsylvania produces 4,043,679 barrels of lime, while the production of Maine is 1,903,639 barrels. The value of the Maine output is 1,523,499 dols., while that of Pennsylvania is only 1,195,955 dols. A large proportion of the lime produced in Pennsylvania is used for agricultural purposes which requires only inferior grades, whereas the lime from Maine is almost entirely used for building purposes in many of the principal cities on the Atlantic coast.

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THE BATTERSEA POLYTECHNIC.

ON Monday the Prince of Wales laid the memorial-stone of the Battersea Polytechnic, in the Battersea Park Road, the first of a series of polytechnic institutes proposed to be erected in London, and endowed under schemes prepared by the Charity Commissioners with funds arising from the City of London Parochial Charities Act, 1883. It is proposed that two of these institutes shall be erected south of the Thames (the other being in the Borough Road), in addition to the institute of the Goldsmiths' Company at New Cross, which the Prince opened on Wednesday. The institutes in the Borough Road and Battersea will be under the control of their own governing bodies, which will include representatives of the County Council and the London School Board, with the controlling influence of the central governing body of the City of London Parochial Charities and the Charity Commissioners. No intoxicating liquors are to be allowed, and the institutes are to be placed on an unsectarian basis. The cost of the buildings is estimated to be 40,000*l.*, and land and fittings will bring the total cost up to 60,000*l.* The bulk of the money has been provided in three generous donations, one of 20,000*l.* by the late Mr. Guesdon, of Clapham, and two of 10,000*l.* each by Mr. Henry Tate and Mr. Frank Morrison. All classes in the locality have, however, taken an interest in the scheme; collections have been made in workshops, funds have been raised by concerts, the children of the Board schools have contributed their mites, and the total amount raised is within 9,000*l.* of the total sum required. The site in the Battersea Park Road is some two and a half acres in extent, and is held on lease for 91½ years from Lady Day, 1886, but it is proposed to acquire the freehold. On the whole 60,000*l.* being raised, an endowment of 2,500*l.* a year will be secured, 1,500*l.* a year being already secured, payable when the work is commenced. It is intended that building operations shall be commenced shortly.

The plans of the institute have been prepared in competition by Mr. Edward Mountford on the basis of a report prepared by Mr. Rowland Plumbe, F.R.I.B.A., as to the requirements of a polytechnic, which in its turn was submitted to the criticism of experts. Mr. Mountford's plans were submitted to the criticism of Professor Garnett, principal of the Durham College of Science, Newcastle-on-Tyne, at whose suggestion certain alterations were made. The buildings will stand some 40 feet back from the road. In the elevation the effort has been made to give what is recognised as a distinctly collegiate character, consistent with educational purposes. The materials to be used are red brick and terra-cotta. There will be a main block with two or three annexes. The main block, fronting the Battersea Park Road, will be 260 feet in length and two storeys in height. The ground-floor will be occupied by the administrative department. Upon the first floor will be class and lecture-rooms, band and music-rooms, and above these will be art schools, photographic-rooms and various laboratories. The shops will include bricklayers and plumbers' shops, engineers' and turning shops, a pattern-maker's shop, carpenter's shop, electric workshop, and dynamo, boiler and engine-rooms. There are also to be social and refreshment-rooms for both sexes, with separate entrances. At the back will be gymnasia and a swimming bath. Economy in the working of the building led, it is understood, to Mr. Mountford's plans being preferred. Though there are to be three entrances, they may all be commanded by one attendant in the centre of the building. As the inauguration of the scheme took place only some three years ago at a meeting at the Mansion House, there cannot be said to have been undue delay in the raising of so large a sum of money.

METROPOLITAN SEWERS.

ACCORDING to Mr. Crawford Barlow the evidence given in connection with the ventilation of the Houses of Parliament brings into prominence a danger which, if not soon dealt with, will produce very serious consequences through the whole of the metropolis—that is, the overcharging of the sewers during storms.

The evidence given by the district-surveyor of Westminster was to the effect that during the storm of July 8 the low-level sewers in the vicinity of the Houses were fully charged. That this is the case in the majority of the sewers of the metropolis (especially those near the river) during every heavy fall of rain is a well-known fact to those who have had occasion to study the evidence of such investigations as have been made—for instance, the Royal Metropolitan Sewage Discharge Commission, 1884.

The evils resulting from this are twofold—first, as the increased volume of liquid enters the sewers the sewer-gas is forced out, and all the ingenious traps and other contrivances which modern hygienic knowledge has devised cannot resist its pressure, and the gas enters the houses with results which are too well known to need description; secondly, as the main

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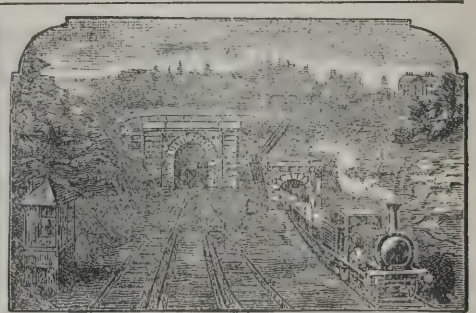
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outfall sewers are unable to carry off this enormous volume of liquid, "storm outlets" have been constructed, which discharge a liquid composed largely of sewage-matter from the sewers direct into the river in the heart of the metropolis. There were in 1884 forty-eight of these outlets, and since then others have been constructed; and as the volume of this liquid increases even faster than the population, and others will have to be constructed, it follows that the river is being more and more charged with crude sewage, and in course of time will arrive at the condition it was in before the main-drainage works were commenced. This result was foreseen by Captain (now Sir Douglas) Galton and Mr. Simpson, who then reported "that the limited provision for rainfall in the sewers proposed would cause the sewage to frequently overflow into the Thames within the metropolitan districts." The remedy for these evils is to construct special conduits for carrying the rain-water off all roads, open spaces, public buildings, &c., direct into the river, and thus leave the sewers for conveying away sewage, refuse of manufactures and the rainwater off private houses. These conduits might be constructed at a moderate cost and with practically no disturbance of the surface of the roads, if the system of construction adopted, first at Tower Subway, and still later at the City and South London Railway, were used. Such an arrangement would not only entirely remove the dangers above referred to, but also considerably reduce the annual expenditure now incurred for pumping those large volumes of liquid from the low to the high-level sewers, a fact which will (if the dangers do not) appeal to the ratepayers of London.

CITY TRAFFIC.

IN the preliminary report on the Day Census of the City, submitted to the Court of Common Council by Mr. James Salmon, the chairman of the Local Government and Taxation Committee, and adopted, it is stated that the census of street traffic was taken on May 4, the result of the twenty-four hours' counting being—

	1891.	1881.
Persons entering the City on foot or in vehicles	1,121,708	797,563
Vehicles	92,488	71,893

These particulars were collected at eighty inlets, as compared with sixty inlets on the last occasion, and consequently required a larger staff and increased supervision. It is almost impossible to grasp the idea that over a million persons flock daily to this centre of the world's commerce; but still more striking is the fact that during the last ten years the increase has been 324,145—a growth approaching one-half of the number in 1881.

Full details are in course of preparation showing the numbers at each separate inlet. These will appear in a subsequent report. Meanwhile it may be interesting to note, and it will assist us to comprehend, the marvellous increase of incomers, if I give an illustration drawn from the traffic at the cluster of railway-stations in Liverpool Street:—

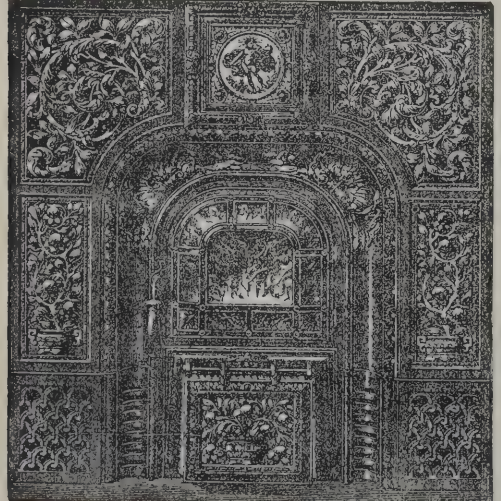
	1891.	1881.
G.E.R., Liverpool Street	52,413	33,890
N.L.R., Broad Street	43,042	30,444
Met. Ry., Bishopsgate	13,180	9,325

The vehicular traffic shows an increase of 20,595. I am having prepared a table setting forth every class of carriage and the number in every hour. It will be seen that though at all times during the day the traffic is great, yet there are certain periods of extra pressure when, but for the admirable arrangements of our police, our streets in many places would become impassable. In connection with this matter, many questions may arise in the future concerning the cost of paving and of street improvements, and I therefore have given especial attention to these returns of traffic.

VENTILATION OF HOUSE OF COMMONS.

THE Select Committee appointed to inquire into the ventilation of the House of Commons have finished taking evidence, and will meet again for the consideration of their report. It is believed that they will recommend alterations in the existing apparatus involving an expenditure of about 6,000*l.*, their principal suggestions being the enlargement of the air inlets and the provision of gratings and double windows in the committee-rooms. In foggy weather all air admitted to the House is passed through cotton wool, with fairly satisfactory results. It is not improbable that the committee will recommend the adoption of the same system in a somewhat modified form throughout the session. The committee are reported to be strongly of opinion that the impurities at present noticeable in the atmosphere come from outside the House, and it is possible that the London County Council may be urged to take some steps in the matter.

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HOLBORN IMPROVEMENT.

THE London County Council have just received a memorial from numerous ratepayers of Holborn, Southampton Row, and the adjacent neighbourhood, stating (1) that the traffic of Holborn is seriously impeded by the cross traffic emerging from Southampton Row and Little Queen Street; (2) that Southampton Row (from Bloomsbury Place to Holborn) and Little Queen Street are too narrow for existing traffic, and the narrow exits of these thoroughfares into Holborn only admit of two vehicles abreast; (3) that unless these thoroughfares of Little Queen Street and Southampton Row are first widened and rendered suitable for additional traffic, the proposed removal of the gates near the Euston Road will, by increasing the traffic through these narrow thoroughfares, seriously aggravate the grave inconvenience now experienced by the public and ourselves as traders in Holborn, Southampton Row and Little Queen Street. The memorialists, therefore, urge upon the London County Council to defer opening up a new public thoroughfare from North London into Holborn by removal of street gates toward Euston Road until such time as the Council shall be in a position to effect the necessary widening of Southampton Row and Little Queen Street, and give convenient access therefrom into Holborn.

EMPLOYERS' LIABILITY ACT.

THE House of Lords on Tuesday gave judgment in the appeal case of Smith *v.* Charles Baker & Sons. A very important question affecting the responsibility of employers for injury sustained by a workman was involved. The appellant, Smith, was employed by the respondents, a firm of railway contractors, in rock-cutting in the Halifax high level cutting. During these operations a large stone fell upon him, the accident being brought about by workmen employed on other operations. On proceedings being taken in the County Court the judge entered judgment for 100*l*. This being appealed against, the late Baron Huddleston and Mr. Justice Wills dismissed the appeal, with leave to carry the case to the Court of Appeal. The Court of Appeal directed judgment for the defendants. Against this judgment Smith appealed to the House of Lords. A majority of their lordships reversed the judgment of the Court of Appeal, and restored the judgment of the County Court judge. The Lord Chancellor, in the course of his judgment, said:—I think the cases cited at your lordships' bar established conclusively the point for which they were cited—that a negligent system, or a negligent mode of using perfectly sound machinery, may make the employer liable quite apart from any of the provisions of the Employers' Liability Act. In Sword *v.* Cameron it could hardly be doubted that the quarryman who was injured by the explosion of the blast in the quarry was perfectly aware of the risk, but nevertheless he was held entitled to recover notwithstanding that knowledge. It seems to me that in the present case the right of the plaintiff to recover is far more clear than in Sword *v.* Cameron. The interval given to the quarryman to seek shelter was the usual and ordinary one. But suppose in that case the employer had employed the quarryman to do something which by the very form of the employment prevented his hearing the signal which gave him warning to retreat. In this case, as I have pointed out, there was no warning and no signal, but the employer or his representative employed the plaintiff under such circumstances as disabled him from using his eyes for protecting himself against the risk. It seems to me, therefore, that this is a case in which the plaintiff is entitled to recover, and I therefore move your lordships that the judgment of the Court of Appeal be reversed and the judgment of the County Court judge restored.

NAPLES.

THE marked improvement in this city during the last five years, through the demolition of old buildings, construction of new streets, erection of public buildings and, more important than all, the complete system of drainage almost finished, whereby nothing offensive can be discharged into the bay, has led the Neapolitan Municipality to take steps to add to the attractions of the city by the introduction of bathing établissements of a novel, varied and comprehensive character. To this end we understand that a concession has been granted to a syndicate of Italian and English gentlemen, who will have the exclusive right in perpetuity to the bathing-arrangements of the whole bay, they having agreed to purchase and compensate all the present proprietors of the erections now used for that purpose. The concessionaires have undertaken to erect in their stead three elaborate établissements, on convenient sites in the bay, that will secure not only to the residents, but also to English, American and other visitors, all kinds of baths,

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hot, cold and medicated, together with open sea-bathing at safe and graduated depths. These establishments will combine a variety of recreative enjoyments with pension and restaurant accommodation. We purpose at an early date publishing sketches of one or more of these erections from plans that have been placed at our disposal by the English and Italian engineers who have been entrusted with the designs. We understand that the Royal Marina of Naples, as it is designated, will be under the patronage of and has already received valuable aid from several members of the Italian Government and other distinguished Neapolitan gentlemen.

THE STATE OF THE THAMES.

AN urgent protest has been sent to the London County Council by the Woolwich Local Board of Health on the subject of the River Thames, which, in spite of all the labour and cost bestowed upon the works of precipitation and deodorisation at the outfalls, is reported to be this summer in a worse condition than ever. The water is getting polluted over a broader area every year; it is almost as bad now at Greenwich as at Woolwich, it smells badly when stirred by the steamboats at Limehouse, and it is expected to become contaminated between London Bridge and Westminster within the next twelve months as badly as it was before the execution of the main drainage works.

NEW CATALOGUE.

WE have received from Messrs. Hayward, Tyler & Co., hydraulic engineers, a copy of their new catalogue, Part C, on pumps and pumping machinery, which will be further referred to next week.

THE hardware catalogue, "Architects' Illustrated Catalogue of Builders and Contractors' Hardware," just issued by Messrs. F. W. Reynolds & Co., of Southwark Street, S.E., is a large and nicely-bound volume containing nearly 400 pages, and compiled with care. Kitcheners, stoves, fireplaces, chimney-pieces, tilework, baths, hot-water and heating appliances, locks, brassfounding and the numberless articles that for brevity may be described as builders' ironmongery, stable appliances and fittings, sanitary goods, &c., are catalogued. But saying this does not exhaust the goods catalogued, for such diverse articles as safes, planing and moulding machinery are included, and the requirements of surveyors and also plumbers provided for; smiths' tools and apparatus, horseshoe nails and axles, springs, spokes, hubs, felloes, &c., matters which space would not allow of mentioning. Those consulting the catalogue will probably have to tax their minds considerably to think of an article or appliance that they will not find catalogued. The kitcheners, ranges and other cooking apparatus are shown in a large assortment to suit all needs and purposes. In addition to warming stoves, there are gas fire stoves and oil stoves, with gas cooking or oil cooking stoves included. The register stoves for rooms are of every description and the tiled stoves of a varied and handsome description, possessing the qualities now sought for, resulting in economy in fuel and in cleanliness. Good work is also catalogued in overmantels, of which, as well of mantelpieces, there are numerous patterns, and many tasteful ones to select from. Curbs are also an important matter nowadays; in addition to these, tilework for hearths and stove panels are illustrated. Windows' and lights' and door fittings and furniture need not be mentioned further than to refer to the specimens of cast-iron overdoors of good design: railings, gates, vanes, finials, cresting, rainwater goods, contractors' carts and vans, asphalte cauldrons, oils, colours, cement, galvanised iron material are a few of the many diverse matters dealt with in this comprehensive catalogue.

The Indestructible Water-tap.—This patent is the invention of Sir William Thomson, D.C.L., LL.D.; the Palatine Engineering Company, Limited, of Liverpool, are the sole makers. One of the main principles consists in dispensing with the washers used in ordinary cocks, which cause constant trouble and expense, metal to metal being for the first time, under Sir William Thomson's invention, rendered perfectly watertight. These taps have been under test and in use all over the country for more than a year with perfect success. They have been approved, after prolonged tests, by the official authorities of London, Manchester, Glasgow, Leeds, Liverpool, Birmingham and a number of other towns. In Manchester the approval was given only after twelve months' trial on a hot-water service in the Corporation testing-rooms. The engineer of the Portsmouth Waterworks Company, in a letter to the Palatine Company, says:—"I have pleasure in informing you that I have been having your tap tested under pressure and automatically opened and shut, such being recorded upon a recorder attached to the testing-machine, the result being that it was opened and closed 604,000 times, equal to about fifty-four

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years of ordinary wear, when it began to show signs of leaking. At this point the spring was taken out and tested for elasticity, and no perceptible difference could be observed then from that at starting, after which the testing was continued to ascertain its lasting qualities, when it finally gave out after it had been opened and closed 911,000 times, equal to about eighty-three years of ordinary wear." The directors have agreed to use these fittings through their district.

IN the notice last week of the new catalogue of the Midland Wire Cordage Company the word "lighting" has, by a printer's error, been substituted for "lightning."

VALUE OF LAND IN PALL-MALL.

A SITE belonging to the Crown, situate opposite the Athenæum, Reform and Travellers' Clubs, having a frontage to Pall-Mall of 59 feet, by a depth of 60 feet 3 inches, and comprising, including the area in front, 3,770 square feet, has, at the Mart, been offered for letting by auction on a building lease for eighty years, by Messrs. Driver & Co., of Whitehall, and after considerable competition was let at the yearly rent of 1,525*l.*, which is at the rate of 8*s.* 6*d.* per square foot of building area. This, if brought into fee-simple value, at twenty-five years' purchase, would represent nearly 500,000*l.* an acre.

AUGUST BANK HOLIDAY ON THE CONTINENT.

FOR the August Bank Holiday cheap tours have been arranged to the Belgian and Luxemburg Ardennes by the Great Eastern Railway, viâ the Harwich route, enabling holiday-makers to visit Belgium and the Grand Duchy of Luxemburg, including Antwerp, Brussels, Liège, Spa, Dinant, and the hitherto little visited picturesque valleys and interesting old towns of the Grand Duchy. Passengers leaving on Friday or Saturday reach the Ardennes the next afternoon, and can return on Monday in time to reach their homes early on Tuesday. For a longer visit, Holland, the Moselle and Rhine can be included in the above tours. The Great Eastern Railway Company has arranged, in conjunction with the General Steam Navigation Company, trips to Hamburg. Passengers will leave Liverpool Street Station at 8.0 P.M. on Tuesday, July 28, Friday the 31st, or Saturday, August 1, and return by any General Steam Navigation Company's steamer within two months of the date of issue. A steamer of the Wilson Line will also leave Harwich on Friday, July 31, for Norway, Christiansand and Christiania.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

11429. Gillery Smith, for "Improvements in the method of attaching knobs or handles to locks and latches, and various articles of furniture and the like."

11430. Alfred Lanning, for "A double grip spring safety hook."

11441. John Anderson, for "The ventilating of greenhouses, vineries or public buildings automatically."

11496. George Wheelhouse Robinson, for "An improved construction of floor covering."

11524. Charles Aubrey Day, for "Improvements in fireproof buildings and appliances therefor."

11577. Frederick Pugh, for "Oil-cloth as an improved substitute for wall-paper and for ceiling panel, railway carriage and other decorative purposes."

11635. John Stephens, for "Improvements in door bolts, sash fasteners and the like."

11642. Henry Heartfield, for "An improved water and fireproof fibrous material suitable for the manufacture of plain or decorated wall, ceiling or floor linings, electrical and other conduits, bases and coverings, and numerous other purposes for which wood, paper, plaster and cement are now used."

11721. George Hatton, for "Improvements in knobs or handles for door latches."

11812. Richard Hill Dawe, for "Improvements in apparatus and appliances to facilitate the opening, closing, fastening and securing of doors and gates."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CASSELL, Patent Agents, 37 Chancery Lane, London, W.C.

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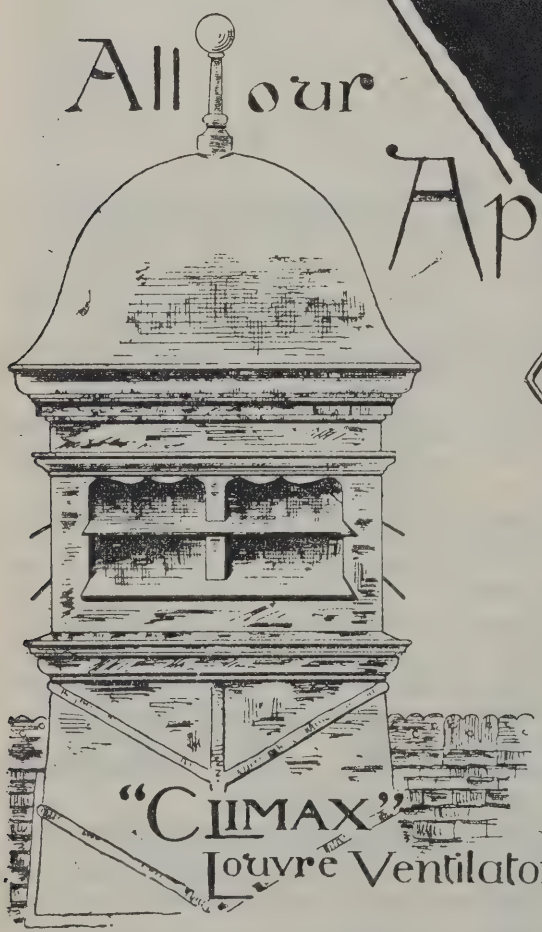
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Friday, July 24, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, JULY 31, 1891.

NOTICE.

THE SURVEYORS' INSTITUTION, Incorporated by Royal Charter, 12 Great George Street, Westminster.

Under the Provisions of the Charter of the Surveyors' Institution, the present "Practice" qualification for admission to membership will cease after August 26, 1891.

Applications for admission to the Fellowship without Examination must be made before the above date on forms to be obtained of the Secretary. The following are eligible, subject to the rules laid down in the By-laws, viz.:—

Surveyors, whether connected with Architecture, Engineering, Land, Building or Mining. Land or Estate Agents, resident or otherwise.

After August 26, 1891, the admission to the several classes of Professional Membership will be by Examination.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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Special arrangement may be made for a series of insertions on application to the Publisher, P. A. GILBERT WOOD, 175 *Strand, London, W.C.*

CONTRACTS OPEN.

ALFRETON.—Aug. 3.—For Building Small Villa. Mr. William Watson, Victoria Buildings, Alfreton.

ALNWICK.—Aug. 10.—For Rebuilding Star Hotel. Mr. George Reavell, jun., Architect, Alnwick.

BARNSLEY.—Aug. 3.—For Building Glass-house and Warehouse at Stairfoot. Mr. J. P. Kay, Architect, 30 Park Square, Leeds.

BARRY.—Aug. 10.—For Building Hotel, with Stables, &c. Mr. W. H. Dashwood Caple, Architect, 1 St. John's Square, Cardiff.

BELFAST.—For Building Dwelling-house. Mr. Henry Seaver, Architect, 128 Royal Avenue, Belfast.

BIRMINGHAM.—For Building Block of Houses and Shops. Mr. F. J. Yates, Architect, 88 Colmore Row, Birmingham.

BISHOP'S HULL.—Aug. 13.—For Building Schoolmaster's Residence and Boundary Walls. Mr. G. C. Strawbridge, 25 Alma Street, Taunton.

BLACKBURN.—Aug. 6.—For Extending Stables at Fire-engine Station. Mr. J. B. McCallum, Borough Engineer, Municipal Offices, Victoria Street, Blackburn.

BLACKPOOL.—For Building Stables and Covered Yard. Mr. T. Whiteside, Architect, 31 Foxhall Road, Blackpool.

BRECHIN.—Aug. 6.—For Building Public Library. Mr. J. M'Lellan Fairley, Architect, 122 George Street, Edinburgh.

BRIGHTLINGSEA.—Aug. 11.—For Building Battery and Drill Shed. Director of Works Department, Admiralty, 21 Craven Street, W.C.

BRIGHTON.—July 31.—For Supplying and Fixing Iron Fences, Gates, &c. Mr. F. J. C. May, Town Hall, Brighton.

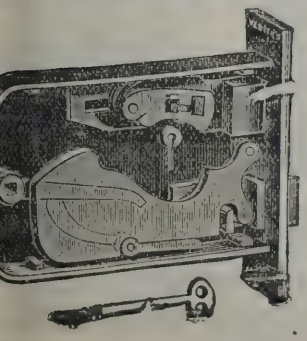
BRIGHTON.—Aug. 13.—For Erection of Shops, Lavatories, &c., on Site of Old Police Station, Grafton Street. Mr. F. J. C. May, C.E., Town Hall; Mr. F. J. Tillstone, Town Clerk.

BRISTOL.—Aug. 6.—For Building Chimney-shaft to Refuse Destructor. Mr. F. Ashmead, Borough Engineer, Sanitary Offices, Bristol.

CARMARTHEN.—Aug. 1.—For Additions, &c., to Elm Lodge. Mr. John Francis, Land Agent, Carmarthen.

CARN BREA.—Aug. 13.—For a 90-inch Cylinder Cornish Pumping Engine, Steam Capstan, Four Cornish Boilers and Fittings. Mr. Nicholas Trestrail, Engineer, Claremont Road, Redruth.

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CORNWALL.—Aug. 11.—For Building Branch Bank and Manager's Residence at Helston, also at St. Colomb. Mr. Silvanus Trevail, Architect, 80 Lemon Street, Truro.

DENBIGH.—Aug. 31.—For Building Chancel and Alterations to St. David's Church. Mr. R. Lloyd Williams, Architect, Park Lane, Denbigh.

DEVONPORT.—July 31.—For Painting Work. W. H. Rathborne, Commanding Royal Engineer, R.E. Office, Devonport.

DUMFRIES.—For Additions, &c., to Auction Mart. Mr. Joseph Graham, Architect, Carlisle.

FERRYHILL.—Aug. 5.—For Building Twenty-four Houses, North-Eastern Railway. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

FOLESHILL.—Aug. 10.—For Erecting Schools. Mr. T. F. Ticknor, 7 Bishop Street, Coventry.

GAINSBOROUGH.—Aug. 6.—For Building Market House, Corn Exchange, &c. Mr. D. G. Macdonald, Surveyor, Lord Street, Gainsborough.

GLASGOW.—Aug. 13.—For Works in Building Police Station and Barracks. Mr. J. Lang, City Chambers, Glasgow.

GOWERTON.—For Building House. Mr. T. B. Martin, Architect, Swansea.

HALIFAX.—Aug. 6.—For Altering Two Shops, Bull Green. Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

HANWELL.—Aug. 10.—For Laying Pipe Sewer. Mr. E. J. W. Herbert, Local Board Offices, High Street, Hanwell, W.

HENDON.—Aug. 10.—For Supply of Gravel and Broken Granite. Mr. W. A. Tootell, Rural Sanitary Authority Offices, Hendon.

HERTFORD.—Aug. 5.—For Repairs, Painting and Decorating at Corn Exchange. Mr. C. E. Longmore, Town Clerk.

HERTFORD.—Aug. 5.—For Erecting Hall and Sunday School Rooms. Mr. James Farley, Architect, Old Cross, Hertford.

HORSFORTH.—July 31.—For Building Six Houses. Mr. J. P. Kay, Architect, 30 Park Square, Leeds.

HUDDERSFIELD.—July 31.—For Tall Chimney and Additions to Confectionery Works. Messrs. John Kirk & Sons, Architects, Huddersfield.

KEITH.—Aug. 5.—For Additions to School. Mr. F. D. Robertson, Architect, Fife Keith.

KING'S HEATH.—Aug. 14.—For Building Petty Sessional Court, with Cells, Residences and Other Buildings. Mr. H. Rowe, County Surveyor, Worcester Chambers, Pierpoint Street, Worcester.

LEAVESDEN.—Aug. 4.—For Painting, &c. Messrs. A. & C. Harston, 15 Leadenhall Street, London, E.C.

LEEDS.—Aug. 8.—For Construction of Urinal, Wellington Street. The Borough Engineer.

LEEDS.—Aug. 8.—For Building Weights and Measures Office, Kirkgate Market. The Borough Engineer.

LEWES.—Aug. 22.—For Supply of Broken Granite. Mr. Arthur Holt, Town Hall, Lewes.

LEYTONSTONE.—Aug. 10.—For Painting, &c. Mr. W. T. Howard, Guardians' Offices, Bishop's Road, Bethnal Green, E.

LIMERICK.—Aug. 1.—For Restoring South Aisle, Chapels, Towers, &c., St. Mary's Cathedral. Mr. R. Fogerty, Architect, Henry Street, Limerick.

LLANDUDNO.—Aug. 1.—For Building Residences and Cottages. Mr. Edwin Turner, Architect, Hazlewood House, Llandudno.

NEWPORT.—Aug. 17.—For Construction of Brick and Pipe Sewers. Mr. F. W. B. Waterworth, Town Hall, Newport, Isle of Wight.

PONTYPRIDD.—Aug. 4.—For Building Pair of Semi-detached Villas. Mr. F. Gibson, Architect, 19 Market Square, Pontypridd.

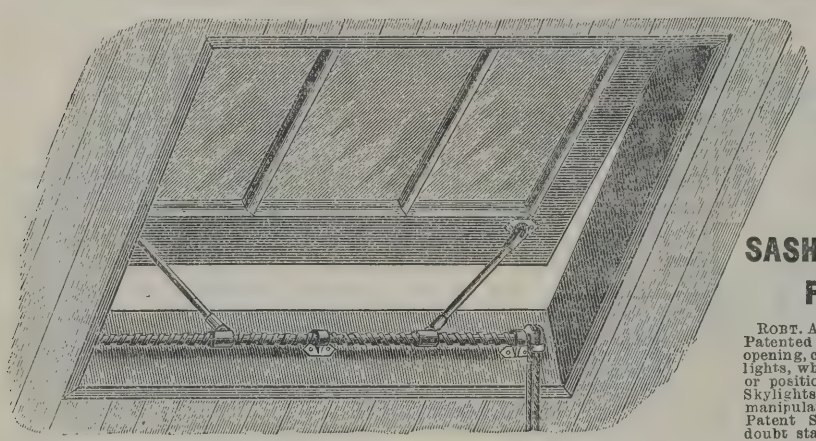
PRESTON.—Aug. 10.—For Barn, Stable, Carthouse and Bridge, for the Guardians. Mr. James Clarke, Union Offices, Preston, Lancashire.

NEW WORTLEY.—Aug. 18.—For Construction of Urinals, Water-closets, &c., at Gasworks. The Resident Engineer, Gasworks, Leeds.

RICHMOND.—Aug. 4.—For Erection of Municipal Buildings. Mr. W. J. Ancell, 3 Staple Inn, London.

ROMFORD.—Aug. 6.—For Supplying and Laying Norwegian Edge Kerb. Mr. A. H. Hunt, Local Board Offices, Romford.

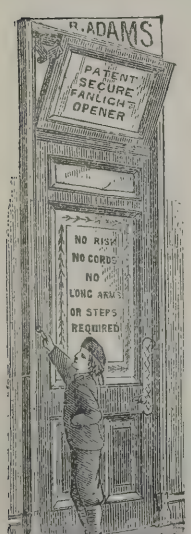
RUSHDEN.—Aug. 12.—For Additional Bedrooms for the Hotel Company. Mr. H. H. Dyer, Architect, Newland Chambers, Northampton.

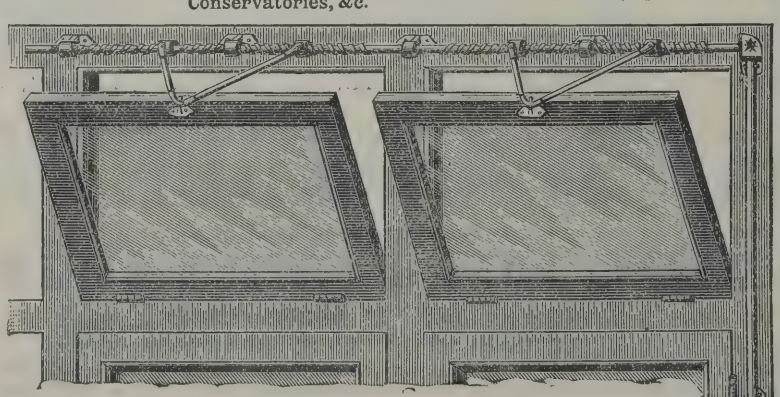


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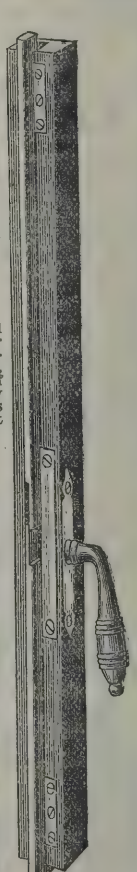




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SOWERBY BRIDGE.—Aug. 10.—For Building Six Houses. Mr. S. Wilkinson, Architect, Sowerby Bridge.

STAFFORD.—Aug. 11.—For Building Coal Stores. Mr. J. F. Bell, Engineer, Gasworks, Stafford.

ST. MARYLEBONE.—Aug. 4.—For Painting, Whitewashing, Repairs, &c. Mr. Joseph Bedford, Guardians' Offices, Northumberland Street, Marylebone Road, W.

STOCKPORT.—July 31.—For Building Infant Schools. Mr. W. Wright, Surveyor, Lancaster.

STOCKTON-ON-TEES.—Aug. 3.—For Additions to Parish Church. Messrs. Johnson & Crawford-Hick, 3 Arcade, Newcastle-on-Tyne.

STOKE-ON-TRENT.—Aug. 4.—For Additions to Board Schools. Messrs. R. Scrivener & Sons, Architects, Hanley.

STORNOWAY.—Aug. 22.—For Construction of Concrete Breakwater and Harbour Improvements, Port Ness. Messrs. D. & T. Stevenson, Engineers, 84 George Street, Edinburgh.

STRATFORD.—July 31.—For Erecting Printing Works. Mr. T. D. Genlloud, Secretary, Liverpool Street Station, E.C.

TADCASTER.—Aug. 1.—For Enlarging Infirmary. Mr. Hodgson Denham, Surveyor, Aberford.

TAUNTON.—Aug. 4.—For Building Engine-house, &c., at Sewage Outfall Works, Supplying Pumps, Gearing, &c. The Borough Surveyor.

THORPE HESLEY.—Aug. 4.—For Building House and Shop. Mr. G. A. Wilson, Architect, Hartshead Chambers, Sheffield.

TOTTENHAM.—Aug. 4.—For Laying Pipe Sewer and Tar Paving. Mr. J. E. Worth, Coombes Croft House, High Road, Tottenham, N.

WAKEFIELD.—Aug. 7.—For Constructing Sewers. Mr. Frank Massey, Tetley House, Kirkgate, Wakefield.

WARRINGTON.—Aug. 6.—For Construction of Swimming and Turkish Bath. The Borough Surveyor.

WHEATLEY.—Aug. 3.—For Pulling Down and Rebuilding Sunday School. Mr. James Farrar, Architect, 29 Northgate, Halifax.

WOODFORD.—Aug. 8.—For Supply of Broken Granite. Mr. J. D. Hooper, Local Board Offices, Woodford Green, Essex.

YEOVIL.—Aug. 8.—For Building Turret to Town Hall. The Borough Surveyor.

YSTRAD RHONDDA.—Aug. 3.—For Building Thirty Cottages. Mr. J. Rees, Architect, Pentre.

YSTRADYFODWG.—July 31.—For Constructing Main Outfall Sewers. Mr. H. Walter Morgan, Local Board Offices, Pentre Rhondda, near Pontypridd.

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For Building Hospital, Fonthill Road, Aberdeen, for the Old Machar Parochial Board.

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John Campbell, plumberwork.
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J. Flower, Northampton	£2,255 0 0
W. Church, Bristol	1,997 0 0
Martin, Maidenhead	1,950 0 0
Stephens, Bastow & Co.	1,949 0 0
J. Greenslade, Stroud	1,887 0 0

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For Building Miners' Hall, Boldon Colliery. Mr. J. H. MORTON, F.R.I.B.A., Architect, South Shields. Quantities by Architect.

Cowper & Henderson, Jarrow	£1,882 10 0
Middlemiss Bros., Newcastle-on-Tyne	1,844 0 0
John Elrick, Sunderland	1,794 14 2
R. Goodwin & Son, South Shields	1,778 0 0
H. Brown, Newcastle-on-Tyne	1,670 0 0
H. Storey, West Boldon	1,630 12 0
W. Foster, Croxdale	1,600 10 0

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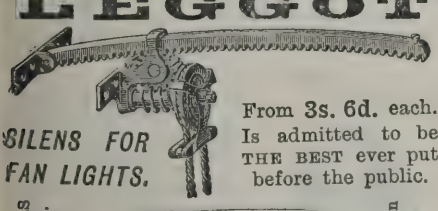
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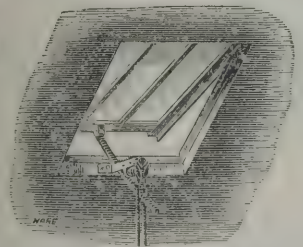
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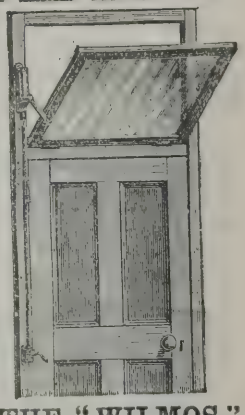
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E. Love	955 0 0
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Barrow, Newton	845 18 0
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DART, Crediton (*accepted*)	790 0 0
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WALKER & SLATER, Derby (*accepted*)	600 0 0

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Batchelor, Harrow	2,400 0 0
Walker, Harrow	2,330 0 0
Gullett, Harrow	2,324 18 3
Larter, Harrow Weald	2,154 0 0

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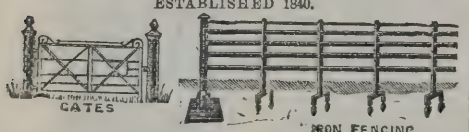
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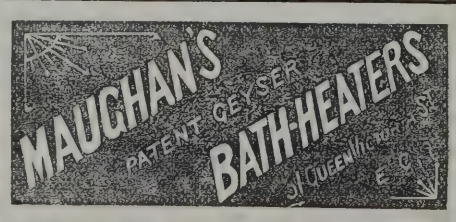
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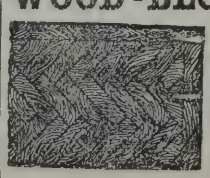
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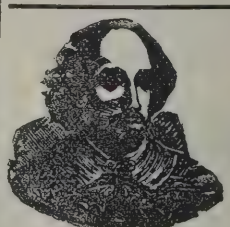
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T. Nye, Ealing	26,747 0 0
Scharien & Co., Chelsea	26,470 0 0
J. & M. Patrick, Chatham	26,150 0 0
A. Kellett, Willesden	25,794 0 0
Flew & Co., West Kensington	24,340 0 0
G. Gibson, Southall, W.	24,300 0 0
LESLIE & Co., Kensington (*accepted*)	23,980 0 0
W. J. Adcock, Dover (*withdrawn*)	22,477 0 0

For Alterations and Additions to the Hackney Workmen's Club, Haggerston Road. Mr. W. BATTEN, Architect.

C. Payne & Sons	£5,188 14 3
Leath & Harris	4,984 16 4
J. Edwards	4,630 18 4
Williams & Richards	4,500 0 0
Rowe Bros.	4,472 0 0
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Inwood	3,956 0 0
Channing	3,898 0 0
R. Edwards	3,751 0 0

For Alterations and Repairs to the Mildmay Tavern, 130 Ball's Pond Road, for Mr. C. H. Belsey. Messrs. SAVILLE & MARTIN, Architects, 86 and 87 Strand.

T. R. Roberts	£1,614 0 0
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F. H. Matthews	62 18 6
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For Alterations and Additions to the Bradley Arms, 179 Wandsworth Road, for Mr. G. Tomalin. Messrs. SAVILLE & MARTIN, Architects, 86 and 87 Strand. Quantities supplied.

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Langridge & Sons	2,100 0 0
Vears & Co.	2,039 0 0
E. Toms	1,793 0 0
R. G. Saker	1,792 0 0
J. Auley	1,777 0 0
GOULD & BRAND (*accepted*)	1,736 0 0
W. S. LANE	1,572 0 0
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W. Winn	95 0 0
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For Alterations and Repairs to the Dover Castle, Coldharbour Lane, for Mr. T. C. Dorling. Messrs. SAVILLE & MARTIN, Architects, 86 and 87 Strand. Quantities supplied.

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T. R. Roberts	1,595 0 0
Candler & Sons	1,500 0 0
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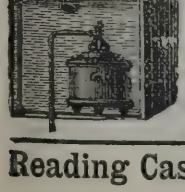
We feel confident that our **DESIGNS**, as well as our system of Lighting and Ventilating will commend themselves to all who are interested in having BRILLIANTLY LIGHTED and WELL-VENTILATED ROOMS.

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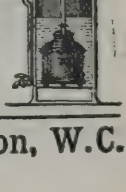
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For Erection of Houses, Vartry Road, Tottenham. Messrs. HOMER & RIDLER, Architects, 35 Bucklersbury.

GAY (*accepted*)	£1,226 0 0

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For New Boiler-house, with Independent Shaft, Three Cornish Boilers, Heating by Steam and Hot-water Supply, New Deep-well Pumps, Engine, &c., and Other Works, for the Guardians of the Poor, at the Union House, Minster, Isle of Thanet. Messrs. ADAMS & SON, Engineers to the Board, 41 Marshall Street, W.

McNeil, Bow	£6,815 0 0
Austen, Birchington	5,192 0 0
Doughty, Margate	4,980 0 0
Dennes, Deal	4,880 0 0
Paramor, Margate	4,857 0 0
Wenham & Walters, Croydon	4,759 0 0
Wise & Co., Deal	4,700 0 0
Rosser & Russell, Charing Cross	4,498 0 0
J. & F. MAY, High Holborn (*accepted*)	4,400 0 0

MOULTON ST. JAMES.

For Building Vicarage House, Moulton St. James. Mr. W. BARRETT SMITH, Architect, 10 John Street, Aldelphi, London.

Ely & Baker, Spalding	£765 0 0
W. Levesley, Spalding	705 7 6
C. A. Watson, Spalding	675 0 0
W. Jellings, Peterborough	634 10 0
MONEY BROS., Wisbeach (*accepted*)	589 5 0

MANSFIELD.

For Building Works and Ways Depôt, for the Mansfield Improvement Commissioners. Mr. R. FRANK VALLANCE, M.S.A., Architect.

Baynes & Oakey, Mansfield	£1,504 0 0
S. & G. Frisby, Mansfield	1,425 0 0
J. GREENWOOD, Mansfield (*accepted*)	1,415 0 0
Evans & Sutton, Sutton-in-Ashfield	1,392 0 0

For Building Two Houses, Welbeck Street, Mansfield, for Mr. E. Smith. Mr. R. FRANK VALLANCE, Architect.

W. A. Vallance, Mansfield	£369 10 0
E. Cuddy, Mansfield	348 0 0
F. J. Baynes, Mansfield	335 0 0
G. BUTLER, Mansfield (*accepted*)	335 0 0

MANSFIELD—*continued.*

For Building Collector's Office, Leeming Street, Mansfield. Mr. R. FRANK VALLANCE, Architect.

J. Greenwood, Mansfield	£310 18 8
Evans & Sutton, Sutton-in-Ashfield	287 7 6
S. & G. FRISBY, Mansfield (*accepted*)	248 0 0
Baynes & Oakey, Mansfield	240 0 0
E. Cuddy, Mansfield	240 0 0

For Alterations to Premises, Westgate, Mansfield. Mr. R. FRANK VALLANCE, Architect.

W. A. Vallance, Mansfield	£892 0 0
E. CUDDY, Mansfield (*accepted*)	725 0 0

POTTERHANWORTH.

For Building Two Pairs of Cottages and Repairs, for the Governors of Lincoln Christ's College, Potterhanworth.

Cottages.

Lansdown & Sons	£849 0 0
J. W. Harrison	813 0 0
H. S. & W. Close	746 0 0
Wright & Sons	723 0 0
J. B. HARRISON (*accepted*)	713 0 0

Repairs.

J. W. Harrison	540 0 0
Wright & Sons	530 0 0
J. B. Harrison	511 4 0
Lansdown & Sons	451 4 0
G. ATKINSON, Potterhanworth (*accepted*)	404 18 0

PRITTLEWELL.

For Erection and Completion of New School Buildings for Boys, Girls and Infants, including Boundary Walls, Fences, &c., in the Brewery Road, Prittlewell, Essex, near South-end-on-Sea, for the Prittlewell School Board. Mr. WALTER J. WOOD, Architect, 1 Finsbury Circus, E.C., and Southend, Essex. Quantities by Messrs. Bushell & Crosier, 1 Finsbury Circus, E.C.

Baker & Wiseman, Southend	£5,131 0 0
F. C. Woodhams, Southend	4,800 0 0
E. West, Chelmsford	4,635 0 0
Darke & Son, Southend	4,599 0 0
F. Dupont, Southend	4,595 10 0
J. GOZZETT, Maldon (*accepted*)	4,218 0 0
Architect's estimate	4,456 0 0

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112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1¼ inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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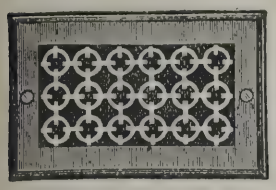
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Noiseless Outlet Ventilator.



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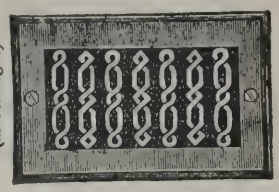
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In CONSTANT and EXTENSIVE USE BY THE ADMIRALTY, HER MAJESTY'S OFFICE OF WORKS, THE LEADING STEAMSHIP COMPANIES AND ARCHITECTS THROUGHOUT THE KINGDOM.

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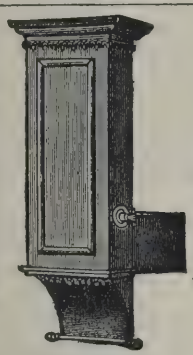


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WARMING, VENTILATING AND CONSULTING ENGINEERS,

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PONTYPRIDD.

For Alterations to Premises, Market Square, Pontypridd, for Messrs. Gibbon & Co. Mr. J. GIBSON, Architect, Pontypridd. Quantities by Architect.

D. Griffiths, Pontypridd	£1,204 10 0
J. H. James, Pontypridd	1,193 0 0
GUBBOCK, Cadoxton (*accepted*)	1,026 5 0

ROCHDALE.

For Building Salvation Army Citadel, Rochdale. Mr. W. GILBEE SCOTT, Architect and Surveyor.

E. Jarvis	£3,895 0 0
G. H. Martin & Co.	3,659 0 0
Rowe Bros., Camden Town	3,570 0 0
T. Berry & Son, Rochdale	3,560 0 0
R. Robinson & Son	3,464 12 0
A. & S. Main	3,447 10 0
S. Hipwell	3,360 0 0
W. A. Peters & Sons	3,174 0 0
T. Crabtree, Rochdale	3,020 0 0

SALISBURY.

For Building Church of St. Mark, Salisbury. Mr. J. ARTHUR REEVE, Architect, 20 Victoria Street, Westminster, S.W.

	Doulton Stone.	Bath Stone.
H. Knight, Morden	£9,750 0 0	£9,350 0 0
Cowlin & Son, Bristol	8,620 0 0	8,570 0 0
Stephens, Bastow & Co., Bristol	7,999 0 0	—
Cornish & Gaymer, North Walsham	7,794 0 0	7,644 0 0
Morrick & Son, Glastonbury	7,328 0 0	7,253 0 0
W. J. & C. S. Young, Salisbury	7,150 0 0	—
W. Gibson, Exeter	6,995 0 0	6,895 0 0
J. S. Kimberly, Banbury	6,382 0 0	6,360 0 0
N. J. Hobbs, Chipping Norton	6,354 0 0	6,279 0 0
E. Abley, Salisbury	6,320 0 0	6,306 0 0
Brook & Son, Southampton	6,287 0 0	—
Webb & Co., Salisbury	6,150 0 0	6,019 0 0
C. A. HAYES, Bristol (*accepted*)	5,975 0 0	5,875 0 0

SOUTHEND.

For Repainting, &c., the London Road Board Schools and Teachers' Houses, for the Prittlewell School Board. Mr. W. J. WOOD, Architect, 1 Finsbury Circus, E.C., and Southend, Essex.

F. GARON (*accepted*)	£57 0 0

SOUTHAMPTON.

For Alterations and Additions, St. Deny's School, for the Southampton School Board. Mr. E. T. HOWELL, Architect Southampton.

J. Bull, Sons & Co., Southampton	£1,784 0 0
W. Franklin, Southampton	1,750 0 0
H. Harvey, Southampton	1,711 0 0
A. F. Boulton, Portsmouth	1,699 8 4
J. Dyer & Sons, Southampton	1,662 0 0
H. Stevens & Co., Southampton	1,660 0 0
J. Crook & Son, Southampton	1,584 0 0

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For Club-house at the Ashdown Forest and Tunbridge Wells Golf Links.

Rice Bros.	£1,350 0 0
T. Morris	1,245 0 0
J. LUXFORD (*accepted*)	1,126 5 0

WALSALL.

For Works at the Walsall Workhouse, Boundary Wall, Outside Iron Stairways and Alterations to Waterclosets. Mr. F. E. F. BAILEY, A.R.I.B.A., Architect, Walsall. Quantities by Architect.

Builder's and Sanitary Work.

J. Mallin, West Bromwich	£1,000 0 0
J. Lynex, Walsall	893 0 0
W. Wistance, Walsall	849 0 0
Guest & Son, Brittell Lane	785 0 0
W. H. BODIN, Wednesbury (*accepted*)	759 0 0

Iron Staircases.

St. Pancras Ironworks Co., London	210 0 0
Macfarlane & Co., Glasgow	200 0 0
ALLAN, SEN., & SON, Glasgow (*accepted*)	193 9 6

WOLVERHAMPTON.

For Erection of New Tower and Copper-house, &c., at the Wolverhampton Brewery, Wolverhampton, for Messrs. C. A. Chater & Co. Mr. ARTHUR KINDER, Architect, Suffolk House, Laurence Pountney Hill, Cannon Street, London. Quantities by Mr. Alexander H. Kinder, 34 Clements Lane, London.

S. S. Willcock, Wolverhampton	£1,629 1 6
Henry Gough, Wolverhampton	1,450 0 0
Henry Lovatt, Wolverhampton	1,434 0 0
Bradney & Co., Wolverhampton	1,420 0 0
GUEST & SONS, Brettell Lane (*accepted*)	1,378 0 0

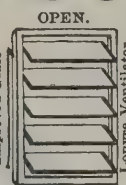
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Manufacturers of Cooper's Glass, Revolving, Circular, and Sliding Ventilators (H. W. Cooper, Sole Inventor).

Improved Glass Louvre and Venetian Ventilators, for Private and Public Buildings, Churches, Halls, and lights of every description. Improved Iron, Copper, Brass, and Gun-Metal Casements. New Hopper Ventilators for Skylights, &c. Medal awarded to H. W. Cooper from Glass Sellers' Company Exhibition, London, 1876. Diploma of Merit, Sanitary Institute of Great Britain Exhibition, Glasgow, 1883. Diploma of Merit, National Health Society Exhibition, London, 1883.

H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.

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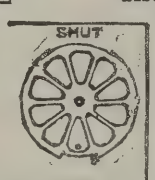
MEDAL AWARDED, 1876.

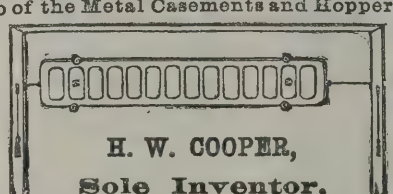


Improved Casement.



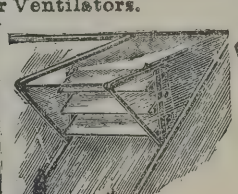
Circular Glass Revolving Ventilator.



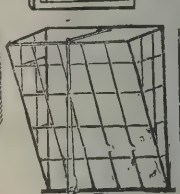


H. W. COOPER, Sole Inventor.

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Improved Hopper for Skylights.



Hopper Ventilator.



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GROVE WORKS, BATTERSEA, LONDON, S.W. (Export Office :— 15 Victoria Street, Westminster). **& BACHELOR'S WALK, DUBLIN.**

REGISTRATION OF PLUMBERS.

THE Devon and Cornwall District Council for the national registration of plumbers met last week at the Drake Chamber, Plymouth. Dr. F. M. Williams, the medical officer of health, in acknowledging his election as a member of the District Council, remarked that the Council were doing a great deal to assist the sanitary authorities. Bad and unscientific plumbing had been the cause of many valuable lives being lost, and the national registration of plumbers was a great safeguard to the public health. On the motion of Mr. Hamblyn, seconded by Mr. White, Messrs. Rowe, Pearce, Serridge, Shuter and Andrews were appointed to wait upon the Plymouth Water Committee to ask, in the name of the Council, that only duly qualified plumbers should be employed as examiners under the new regulations of the committee.

VARIETIES.

A DONATION has been received by the treasurers of the Dundee Royal Infirmary of 210*l.* from the Dundee Working Men's Coffee-houses and Reading-rooms Association, in order to name a cot in the children's ward.

IT is proposed to widen and improve the county bridge over the river connecting Shipley and Baildon. The cost is estimated at 3,000*l.*

AT the meeting of the Montrose Town Council an offer was read from Messrs. D. Tosh & Son, Glasgow, to repair the steeple for the sum of 250*l.* It was agreed, before accepting any offers, to instruct the burgh surveyor to prepare specifications of the work, and to advertise for offers.

THE Ossett Town Council have adopted plans prepared by Mr. John Hanson for the extension of the Eastern Outfall Sewage Works, and will apply to the Local Government Board for sanction to a loan of 700*l.* for the purpose.

AT a ratepayers' meeting held at Uttoxeter Mr. W. H. Radford, C.E., of Nottingham, explained a scheme for new waterworks in the town. The present waterworks are almost useless through lack of pressure and faulty design, and it is proposed to construct a new service reservoir with water-mains throughout the town, and to take powers to acquire additional springs at Somershall Herbert, 3½ miles from the town. The cost of the engineering works would be 5,450*l.* An Act of Parliament will be required. A resolution approving Mr. Radford's scheme was passed unanimously.

AT the meeting of the Surrey County Council it was reported that the arrangements for the site of the new county buildings at Kingston were practically completed, and that it was intended to carry out the buildings in accordance with the plans and specifications prepared by the county surveyor, as approved by the Council.

THE first section of the Douglas Head Marine Drive, Isle of Man, said to be the finest work of the kind in the kingdom, has been opened. The estimated cost of the drive is 40,000*l.*

ANOTHER attempt is to be made by the Skipton Local Board to carry out the Skibeden water scheme, and to promote a Bill in the next session of Parliament to obtain the necessary powers. The Board will ask for power to borrow 40,000*l.*, which will be the complete cost of the works.

AT the last meeting of the Hastings Board of Guardians it was proposed that none of the tenders sent in for the erection of the new workhouse be accepted, and that the architect be requested to furnish his account. The latter part was ruled out of order, as it would rescind a previous resolution. After a long discussion the first part of the resolution was carried by eighteen votes to two.

THE *Leeds Mercury* says:—At a meeting of the Sewerage Committee of the York City Council, held on Tuesday, particulars were received of the claim of Mr. Bottoms, the contractor, in connection with the stoppage of the sewerage works. We understand that the claim, which is stated to be about 10,000*l.*, is based on the ground that the terms of the contract entered into were impossible of fulfilment. The committee instructed the town clerk to file a defence to the action.

PLANS have been prepared for a church proposed to be built for Staincross and Mapplewell, near Barnsley. The building will cost between 2,000*l.* and 3,000*l.*

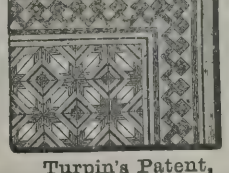
OWING to the alleged defective way in which private drains were often constructed, the Wrexham Town Council has resolved that the by-law relating to these drains shall be strictly carried out, and that the borough surveyor should be instructed to inspect all new house drains previous to their being covered up.

AN old clay quarry hole at Millerhill, Edinburgh, has been used as a receptacle for the refuse of the city. The occupant of a mansion-house, about 450 yards to the west of the quarry, having complained of the smells and swarms of flies which come from the refuse, the County Council ordered an examina-

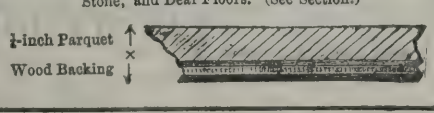
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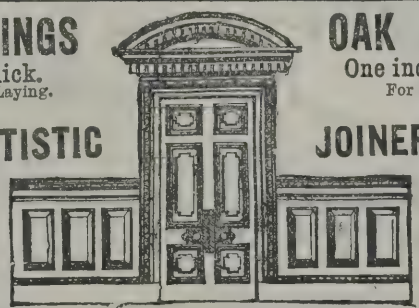
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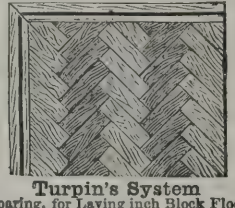
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tion of the place by their health officer, with the result that an intimation has been sent to the town clerk that the disposal of the city refuse in the quarry hole must be stopped under threat of interdict. Threatened with interdict within and without the city, the Cleaning and Lighting Committee are said to be nearly at their wits' end to know what to do with the refuse.

TERMS proposed by the Dudley Corporation have been accepted by the proprietors of the Dudley Arms Hotel, for the purchase of the property at the head of Stone Street for a public improvement.

THE Tipton Board of Health have appointed a sub-committee to consider the question of water supply and the charges of the South Staffordshire Waterworks Company.

THE Southampton Town Council have authorised the purchase of a camera by the Medical Officer of Health. The necessity was mentioned at the meeting of the Medical Officer having a camera for the purpose of taking photographs when applying for an order to close dilapidated property.

WORK is shortly to be commenced on the forming of a new lock on the Thames, between Richmond and Twickenham, by the Thames Conservators. The cost of the improvement is estimated at 60,000*l.*

THE prospects of a settlement of the dispute between Messrs. Lucas & Aird, contractors of the West Highland Railway, and the promoters of the line are, it is stated, considered remote. The contractors have issued instructions for their working plant to be collected and stored in the sheds at the various depôts. Between forty and fifty miles of the permanent way have been completed.

TRADE NOTES.

THE growth of the great metropolis is continually being brought to mind by the extension of the powers and appliances of the police force and the fire brigade. It was not long since that three large floating steam fire-engines, of a combined capacity of 250,000 gallons per hour, were built by Messrs. Merryweather for the fire brigade, and last week the County Council ordered a new land steamer from the same firm, of their "Metropolitan" type, similar to fifteen engines previously supplied, in addition to a number of other sizes.

WE have pleasure in announcing that Messrs. Frank Suter & Co., electric light engineers, of 276 Strand, have removed to larger and more convenient offices and showrooms at 66 Berners Street, Oxford Street, W., where they intend to exhibit an extensive stock of electric light fittings.

WE are informed that Messrs. C. Carr & Co. have secured the order to supply a peal of six bells, about 50 cwt., for the coming pantomime of "Dick Whittington" at the Prince of Wales's Theatre, Birmingham.

THE Directors of the Aberdeen Royal Infirmary have at recent meetings had under consideration the question of engineering plant and electric light installation for the new buildings. Specifications were prepared by Professor Jamieson, Glasgow, and estimates obtained. The directors have accepted the offer of the Babcock & Wilcox Company, Limited, Glasgow, for the engineering plant, including two 100 h.p. boilers; and the electric lighting has been entrusted to Messrs. J. H. Holmes & Co., Newcastle-on-Tyne.

IN the rebuilding at present being carried out on the Duke of Norfolk's estate, Strand, one of the important features is the clock-house, which is just reaching completion, the general contractor for the work being Mr. John T. Chappell. Careful attention has been given to the ventilation, which has been carried out by The "Climax" Ventilation Company, of 15 Great George Street, Westminster.

THE Victoria Hospital for Children, Hull, opened last week by the Marchioness of Salisbury, is warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves, with descending smoke flues, and with ornamental tiled sides. These stoves were supplied by Mr. E. H. Shorland, of Manchester.

IN the notice of the visit of the Civil and Mechanical Engineers' Society to the works of Messrs. Burt, Bolton & Hayward, given in the issue of July 10, Mr. Ashley was incorrectly described as "works foreman," instead of manager of the timber department.

THE tender of Messrs. Perrin & Long, of Winchelsea, to construct a new supplemental reservoir for the sum of 4,759*l.* has been accepted by the Bideford Local Board.

THE directors of Perry & Co., Limited, have resolved to pay out of profits an interim dividend on the ordinary shares, for the first six months of this year, at the rate of 10 per cent. per annum, free of income tax, being at the same rate as for the corresponding period last year.

THE roof ventilators at the Birmingham Law Courts were supplied by Mr. John Gibbs, of Liverpool; the lifts throughout



by Messrs. Tangye Bros. Many of the ceilings of rooms in the building are of moulded fibrous plaster, made by Messrs. George Jackson & Sons. The details of the ceiling of the judges' corridor were modelled by Mr. W. S. Frith. The entrance-gate to the principal porch is of wrought-iron from the architects' designs, and bears in its centre the city arms executed in the proper colours in cloisonné enamel work on bronze, with bronze "supporters," executed by Mr. Clement Heaton. Much of the flooring is executed on Dennett's system. The clock is by Messrs. Gillett & Johnston, of Croydon, the external skeleton dial having been executed in wrought-iron by Messrs. Starkie Gardner & Co. The system for heating and ventilation was described in *The Architect* of July 10.

BUILDING AND BUILDERS.

LEAVE has been granted by the Partick Dean of Guild Court to the Hydraulic Foundry Co., Limited, to make alterations and extensions at their lately-acquired premises in Whiteinch.

AT a meeting of the Gas Committee of the Aberdeen Town Council a sub-committee was appointed to report on the question of increasing the office accommodation at the Gas-works.

THE Governors of the Radcliffe Infirmary, Oxford, have decided to erect a new male ward and to rearrange the old block for administrative purposes, at a cost of about 10,000*l.*

THE *Devon and Exeter Gazette* announces the death, at Bournemouth, of Mr. W. Ryan Commings, formerly of Heavitree House, Exeter, at the age of 55 years. Mr. Commings for a considerable number of years was the principal of the building business which is now being carried on by Messrs. Tree & Bolley.

IN submitting the report of the Markets and Fairs Committee, at the meeting of the Birmingham City Council this week, it was stated that the committee were proceeding with the plans for the new pig market in Montague Street, and that before the committee separated for the holidays they would be able to accept tenders for the necessary work.

THE Bath branch of the Bristol and West of England Bank, Limited, removed its business on Saturday from the temporary premises in Northumberland Buildings to the handsome premises provided for it at No. 42 Milsom Street. The architect for the work was Mr. Alfred S. Goodridge, M.R.I.B.A., of Bath. The contractors were Messrs. Hayward & Wooster. The carving was executed by Mr. Sheppard, of Bournemouth; the bronzes, wrought ironwork, gasfittings, &c., by Messrs. Singer & Sons, of Frome; the decorations by Mr. Beaven, jun., of Bradford-on-Avon.

THE new church, Southwick, Kirkcudbrightshire, has just been opened. The church will accommodate comfortably over 200 persons. A chime of bells, the gift of Miss Stewart, Southwick, has been hung in the tower. The building costs over 2,000*l.* The architects were Messrs. Kinnear & Peddie, Edinburgh.

AN EAST-END MISSION HOUSE.

THE corner-stone of St. Frideswide's Mission House in Lodore Street has been laid by Miss Phillimore, a sister of Sir Walter Phillimore, Q.C., who is giving the site and providing the means of building the house itself. The building is to be erected for the accommodation of sisters trained in the House of Mercy, Clewer, near Windsor. The foundation-stone at the north-west angle of the building is of red Corsehill, and bears the inscription, "St. Frideswide's Mission House" on the Lodore Street face, having a raised cross in the centre; the inscription next Duff's Fields being "Laid July 9, 1891." The building will be a complete example of this purely modern type of building, everything being arranged with a view of separating the different sections of the building at ordinary times, while communication with all parts is secured when required. It will contain on the lower storey a spacious clubroom and recreation-room for girls, a soup kitchen and a parish-room. The community's refectory, kitchen, scullery and offices will also be placed on the same floor. By passing through the open yard, the church of St. Frideswide adjoining will be reached by the community without it being necessary to go into the street. On the next storey there will be a sitting-room and two bedrooms for lady workers in the parish, a private room for the sister in charge, the sitting-room for the community and a small oratory adjoining the church. There will also be a guild-room for girls, reached by a separate staircase placed next to the room for the sister in charge. Two pair storey: nine bedrooms, work-room, bath-room, &c. The exterior of the building will be intentionally simple. The object in view has been to secure a good outline and an easy homelike appearance. The only feature of importance will be the main entrance for the community in Lodore Street. The



MAW & CO., LIMITED, will forward on application Pattern Books or Special Designs, with Estimates for all kinds of Floor and Wall Tiling. Patterns can also be seen and particulars obtained at the Show-rooms of their appointed London Agents, Messrs. W. B. SIMPSON & SONS, 100 St. Martin's Lane, W.C.

D

elevation will be of blue Staffordshire bricks, to a height of 4 feet above the pavement, and above that height of yellow, with an admixture of red bricks. Messrs. Clarkson, of 146 High Street, Poplar, and 28 Great Ormond Street, W.C., are the architects.

THE CARLISLE MASONS' AGITATION.

FOR some time past, says the *Carlisle Journal*, an agitation has been going on among the operative masons of Carlisle, in common with those of many other centres, for an advance in wages and a reduction of the hours of labour. About twelve months since the wages paid by the masters in this city amounted to 6*d.* per hour, but in the interval up to the present time the men have asked for several increases in wages, which at the commencement of this week stood at 8*d.* per hour. These advances the masters have willingly conceded, the state of the building trade being brisk and general conditions making the request on the part of the operatives reasonable and fair. Recently, however, the men agreed to ask for another ½*d.* per hour, so as to make their rate of pay 8½*d.* instead of 8*d.*, and a meeting of the masters was held at the Coffee House Hotel to consider the application. The result of the conference which took place was that the masters, with the view of protecting their own interests and the interests of their clients, formed themselves into a Master Builders' Association, and the question at issue was adjourned for a week. Another meeting was held last week, when a lengthy list of demands was brought forward on behalf of the operatives who had formed themselves into a society. The masters agreed to advance the men's wages as requested from 8*d.* to 8½*d.* per hour, but did so without prejudice to the final adjustment of the various matters which will now have to be debated by the rival associations. The concession was granted with the view of preventing the possibility of a strike and also to secure the non-disturbance of several contracts now on hand. The masters, however, hold to the opinion that the state of the building trade is not such as warrants the permanent advance in wages that they have conceded.

The following are the ten various requirements which the operative masons have drawn up, and which are to be considered :—

Hours of Labour.—From February 14 to November 11, work to commence at 6.30 A.M. and cease at 5 P.M., Saturdays excepted, when work shall cease at noon all the year round. From November 12 to December 12, work to commence at 7 A.M. and cease at 5 P.M.; from December 13 to January 13 work to commence at 7.30 A.M. and cease at 4.30 P.M.; and from January 14 to February 13, 7 A.M. to 5 P.M., or start at any half-hour up till 9.30 A.M.

Meal hours.—Half an hour for breakfast and one hour for dinner.

Wages.—8½*d.* per hour all the year round.

Walking time.—Walking time to be allowed to all country jobs three-quarters of a mile from the Town Hall, at the rate of three miles per hour. All jobs three-quarters of a mile from the Town Hall to be paid on the job, or men to be allowed walking time to the office.

Sheds.—Sheds, &c., to be erected on all jobs where necessary.

Overtime.—Overtime to be worked only in cases of emergency. Overtime on Sundays and Christmas Day to be paid double wages, and overtime during the week to be paid at the rate of time and a quarter for the first two hours, time and a half for the next two hours, and double time after that.

Piecework.—All work to be done by the hour, and no employer to sublet any portion of his contract. No mason to do piecework. No worked stone to be allowed to come into the town except Bath and Caen stone, Lazonby and Yorkshire steps and landings.

Notice.—One hour's notice to leave on either side.

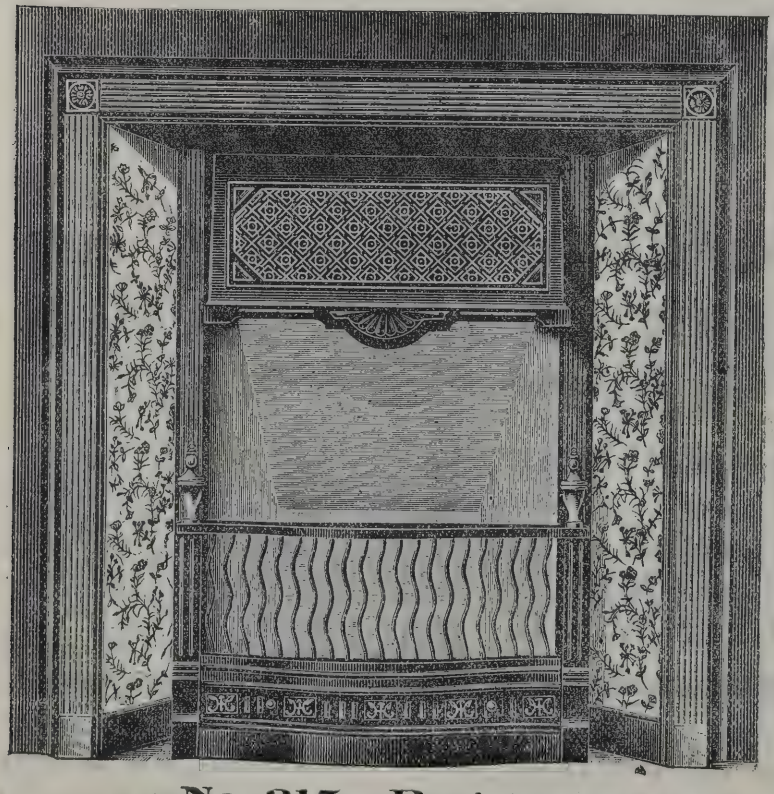
Apprentices.—Apprentices to be legally bound for not less than five years, and not to work more than three months or be over 16 before legally bound. Masons' sons and stepsons to be exempted from this rule. Not more than one apprentice to six men.

Alterations.—Alterations in the foregoing stipulations to be given three months' notice of on either side between May 1 and August 1.

FRYER'S VENTILATORS AND COWLS.

THE special advantages claimed for the patent ventilators of Messrs. J. D. & W. Fryer, North Works, Brecon, are:—1. Simplicity in construction; no loose part to get out of order; no winding screw to get clogged or choked with dust, &c. 2. The working arrangement of these ventilators is so sensitive that the least breeze will cause the head to revolve rapidly,

CROSTHWAITE'S PATENT STOVES, WITH ADJUSTABLE CANOPIES.



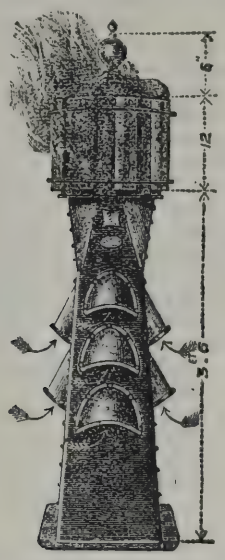
No. 315c.—Register.
PATENT ADJUSTABLE CANOPY,
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A NEW ILLUSTRATED PRICE LIST, containing 80 pages of Stoves, Interiors, &c., is now ready. Those desirous of having a copy will please forward their name and address to the Patentee,

Robert Crosthwaite,
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PATENT No. 2496. A.D. 1884.

thereby creating a change of atmosphere in the room in all weathers. 3. Absence of friction; bearings, which are ball, move in oil. 4. Fully 100 per cent. greater up-draught caused by the inlets in each side. 5. Patented hinge flap in top of head renders easy access to the bearings for oiling, &c. 6. A snowstorm does not impede their action, neither are they affected by frost. 7. Inside of base a conical syphon is fitted, by which the force of abstraction is doubled. 8. In the inside



of the revolving hood angular vanes are arranged, which greatly increase its discharging power.

The ventilators are for ventilating all kinds of buildings without opening windows or doors, and they are made of galvanised steel sheets and covered with enamel paint. The ventilators are specially adapted for churches, chapels, schools, theatres, concert-halls, hotels, clubs, smoke-rooms, mansions, lecture-halls, billiard-rooms, studies, public buildings of any kind, factories, warehouses, workshops, storerooms, stockrooms, granaries, maltrooms, washhouses, laundries, stables, coach-houses, cowhouses, outhouses, summer-houses, &c.

NEW CATALOGUES.

AN illustrated list, "C" 1891, has been issued by Messrs. Hayward Tyler & Co., hydraulic and general engineers, brass-founders, &c., of Upper Whitecross Street, E.C., of pumps and pumping machinery, well-frames, steam-fittings, engineers' sundries, &c. Notes as also tables are furnished, and these, the tables especially, are most useful addenda to a catalogue of this description. The word "pump" naturally conveys the idea of lifting water. Water is incapable of motion, beyond flowing or falling to a lower level, unless force, natural or mechanical, is applied. Water, wind, fire, steam can all be pressed into service as motive powers, or the motive power may be a man, a horse or other animals. Water has to be lifted for many purposes, among others for protecting life and property, as in the case of ships' pumps and the fire-engines of our fire brigades. There are pumps for wells, force-pumps, pumps and pumping machinery for collieries and the deep Cornish mines, pumps for agricultural purposes, for gardens, for contractors, pumps worked on the windmill principle, and the hydraulic ram, a development of modern days, working, as it is called, automatically. Every principle which has ever been used for lifting water is still in use to-day in some improved form, besides what new apparatus has been devised by modern science, for example, the primitive idea of shovelling-up water or lifting it by buckets is now scientifically applied. We do not intend to go into details of the numberless pumps, &c., spread over nearly two hundred pages in this catalogue. A reader of the catalogue would find in one kind of pumps, those worked by hand, for instance, quite enough to occupy his spare time in the mere reading. Luckily, in consulting the catalogue a person knows his requirements. According to these requirements it is not difficult to determine what agent to apply as motive-power. The tables, calculated from past experience, are a trustworthy guide in another direction; local circumstances he also takes into consideration, and out of what may appear a perplexing choice in the variety of the one particular kind suitable, he selects that which is the most efficient and the most economical in the expenditure of fuel, or, it may be, labour, time, &c.

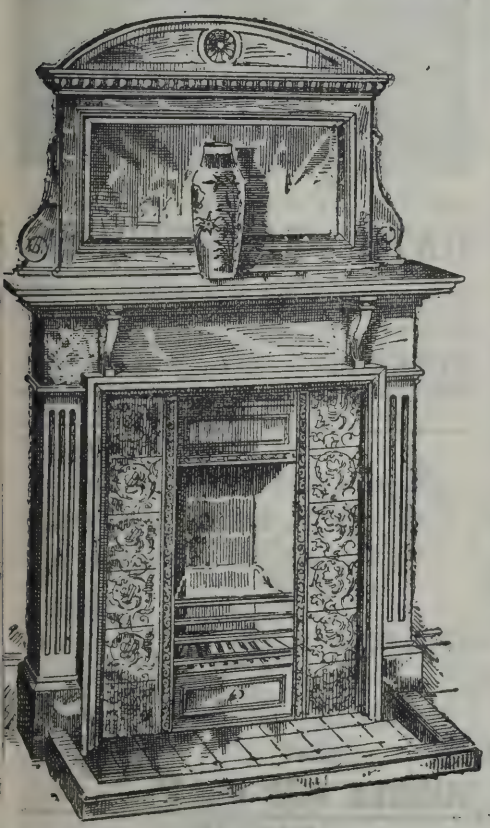
MESSRS. WYCKOFF, SEAMANS & BENEDICT, of 100 Gracechurch Street, E.C., sole proprietors and manufacturers of the "Remington Standard" typewriter, have sent us their illustrated price list. It may be mentioned that No. 4 Remington Standard typewriter is stated to have been used with wonderful success by blind persons. No. 5 is a new model, specially

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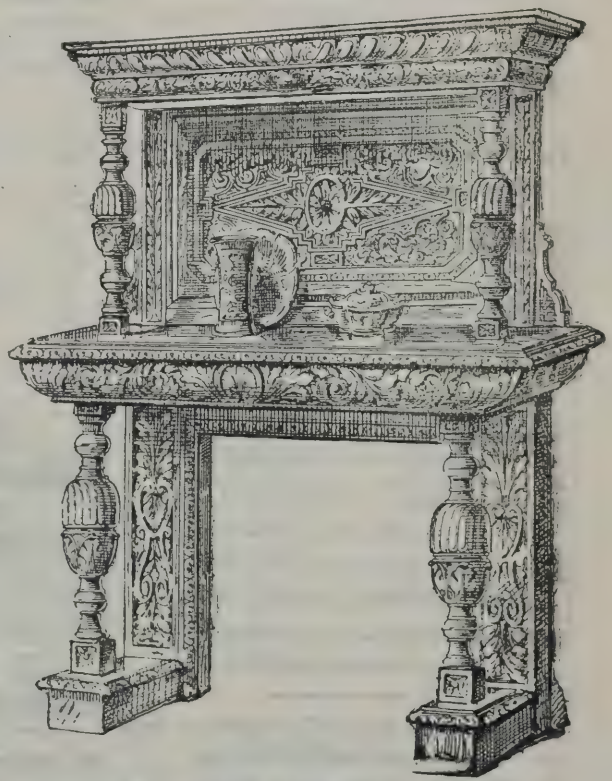
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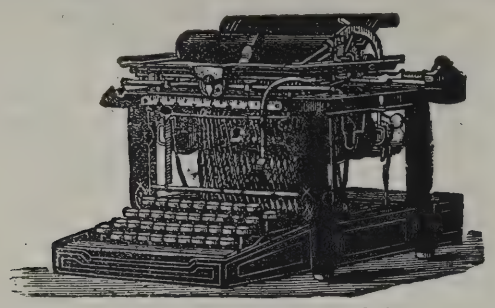
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designed for use in this country, taking paper nearly 9½ inches wide, and writing a line nearly 7½ inches long. Various cabinets with drawers, tables used in connection with the typewriter, are illustrated; also travelling-cases, copyholders, &c.



Many pages are also added explanatory of the process of typewriting, together with details and information the omission of which would be a distinct loss to any person possessing a typewriter for the first time.

Heating and Ventilation.—An illustrated price-list has been brought out by Messrs. Kite & Co., ventilating, sanitary and heating engineers, of the Christopher Works, Chalton Street, N.W. Mr. Kite's name has been so long associated with questions of ventilation, from the attention he has paid to them, and having been among the first to study the subject, that it is not surprising to find that he has been at the pains to combine under the same cover a useful treatise on ventilation, thus giving the results of his experience in a simple way, in which anything like mystery is avoided. Messrs. Kite & Co. have received numberless medals and honorary awards at exhibitions, and can show a large collection of testimonials also received by them.

THE NEW POST OFFICE FOR LEEDS.

A CORRESPONDENT who has been comparing the new design for the post office about to be erected on the site of the old Coloured Cloth Hall with that originally prepared, to which exception was taken by the Corporation and other public bodies, has sent us, says the *Leeds Mercury*, the following notes:—The front elevation in both designs is broken up by dividing it practically into three parts. The centre portion consists of five bays, and is flanked on each side by two projecting pavilions, which are also broken up by two projecting wings and a recessed centre, containing projecting bay windows. The principal points of difference are the substitution of Tuscan columns in addition to the recessed panelled pilasters forming the piers between the windows of the central arcade of five bays constituting the central recess. The doorways are certainly more imposing by the pediment being raised so as to include the windows over the doors and the outer columns to carry figures. The bay windows, two storeys high, forming the centre feature of the pavilions, are made wider, and will be improved by retaining the carving over the ground-floor windows and the perforated parapet, as shown in the original design. Over the piers of the central arcade are substituted circular Corinthian columns, supporting a plain frieze and moulded cornice and a sculptured statue, instead of the plain flat pilasters dividing the windows in the original design. The third or top storey is practically about the same as in the first design, but there has been a decided attempt to improve the outline of the building above the parapet main cornice. The first design showed a bold and striking centre gable, spanning the three central bays of the centre recess, and over this, rising from the ridge, is an octagonal turret, with pilasters and domical roof, with a lantern light above, terminating with a small dome and finial. In lieu of this centre gable are substituted a series of five dormer windows rising above the parapets, with pilasters and pediments, and in lieu of the centre turret there rises from the centre of the roof a square tower formed by four pilasters, with three recessed arched openings on each side, and with a parapet and angle terminals; and above is an octagonal lantern light, with plain pilasters placed across the angles and surmounted by a dome and finial. The outline of this tower is very suggestive of the outline of the town hall on a diminutive scale, and it is questioned whether this feature and the fine central dormers would not be much better omitted and the original central gable and octagon turret retained. Instead of the four plain, slated roofs at the angles of the pavilions, octagonal pedestals and terminals are placed on each side the attic windows, which have pilasters and pediments, surmounted by substantial blocks of masonry formed of coupled flat pilasters on each side an open circular arch, with entablature of frieze, and cornice and blocking above. There is no alteration in the side elevation to Infirmary Street, which, with the exception of the north-eastern gable, is two storeys high, with circular arcaded windows, broken up by projecting wings,

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2.	Twickenham.	13.	Dewy Eve.
3.	A Shadowed Stream.	14.	Mousehold Heath.
4.	The Draining Mill.	15.	Cader Idris.
5.	On the Greta.	16.	Castle Eden Dean, Durham.
6.	The Château, Normandy.	17.	Bamborough Castle.
7.	Rouen from Mount St. Catherine.	18.	The Interior of Norwich Cathedral.
8.	Breaking the Clod.	19.	Mountain Pass in the Tyrol.
9.	View in North Wales.	20.	Postwick Grove.
10.	Norman Arches.		
11.	Byland Abbey.		

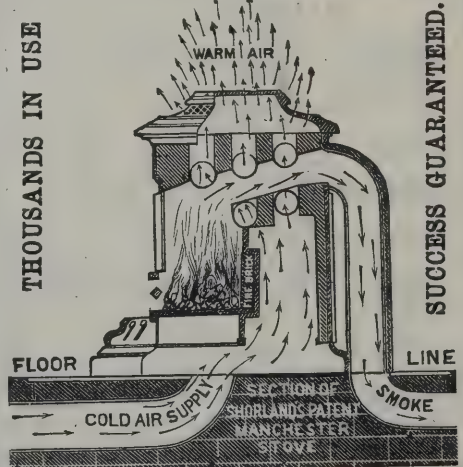
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terminated by gables surmounted by curved pediments. The roof-line between these side gables is broken up by dormer windows crowned by cornices and pediments. The alterations suggested by the new design are more expensive, and will decidedly present an improved architectural appearance and be more in accordance with the growing importance of the town. The building when complete will be one of which the inhabitants may be justly proud.

The council of the Leeds and Yorkshire Architectural Society have made the following report on the new design :—Generally speaking, we consider the amended design a decided improvement upon the one originally submitted. There is a boldness and breadth of treatment displayed in the handling of the architectural features which was lacking in the first design. This improvement, however, does not apply to the design of the central tower, or cupola, which, although of larger size than that originally shown, is feeble in design, and certainly requires further consideration. If it is to be carried out in stone as stated in the newspapers, its architectural features are on too small a scale to harmonise with the proportions of the building below ; and if it is to be of woodwork, it would prove much too large for suitable treatment in that material. The improvement of the central portion of the principal façade may be characterised as follows :—The range of semicircular, arched windows on the ground floor gains by being deeply recessed, and treated with detached columns in place of panelled pilasters; and on the first and second floors above, the wall surface and fenestration, with detached columns carrying statuary between each window, are marked improvements upon the original design, which was much too "crowded" in effect. Exception may be taken to the range of five dormers above the parapet, over the main cornice, which have a meagre look about them, and would be improved if handled in a bolder and less stiff manner. By the lifting up of the pediments over the fanlights of the principal entrance doorways, in place of being situated below as at first intended, these important architectural features are additionally emphasised, and in consequence have a better appearance. The slightly projecting end wings of the front elevation we think are improved by the groups of chimney shafts linked together with arcading, in place of the receding hipped roofs which characterised the original design. Below the cornice, an appearance of solidity is imparted to these portions of the structure by means of piers at the angles of the projections. It is cause for regret that the architect has not arranged for a more suitable position for the letter-boxes than the one indicated under the window-sill of the bay-window of the sorting-office, with its overhanging metal or glass shelter. A recessed loggia or arcade would appear to us more worthy of the building.

ATHENÆUM BUILDINGS, GLASGOW.

IT is little more than three years, says the *Glasgow Herald*, since the Athenæum removed from the building it so long occupied in Ingram Street to the handsome new building which had been erected for it in St. George's Place, and so marked has been the success attending the various departments of the institution in its new home that the directors have been obliged to make arrangements for the further extension of the building. Plans have been prepared with this object, and passed at the Dean of Guild Court. The new building, which will occupy the site of the old Religious Institution Rooms, will have a frontage of about 45 feet to Buchanan Street, and extend along St. George's Court about 86 feet, and will give accommodation to the following departments of the institution :—1. For the School of Music, the Dramatic Society, and general purposes, a hall seated for 700 persons. 2. For the restaurant, a large light luncheon-room, a large smoking-room, and a dining-hall, about 85 by 40 feet, with a complete kitchen and administrative department. 3. For the recreative department, a public and a private billiard-room, the one with five tables and the other with one. 4. For the School of Music, music-rooms and a large room for drawing-room entertainments. 5. A new gymnasium, with extensive dressing-rooms and lavatories.

The entrance is at the north corner of the site, and a handsome staircase, oval in plan, with an elevator in the centre, gives access to the various floors, with a service elevator at the angle of the stair, taking the place of a service stair. The hall, which is situated in the basement, is seated as a theatre, with folding-chairs, the audience being about equally divided in area and gallery, each part of the house having separate access and independent emergency doors ; these latter, opening on the lane which passes along the south side of the building, are so placed that in the event of panic the audience should be attracted to different parts of the hall in the proportion of about 100 to each door, the doors being of a size that, under the Dean of Guild Court regulations, is sufficient for the exit of 1,000 people. Cloak-room and lavatories are conveniently situated in the level of the area of the hall, and the smoking-room and light luncheon-room of the refreshment department are so situated that they

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TESTIMONIALS.

21 New Bridge Street, London, E.C. : February 28, 1886.

I have had some trials made with the KALLKOLITH during the past few weeks, the results of which are very satisfactory. The KALLKOLITH is to be used as the first coat of paint on wood and other substances, and is of such a nature that the ordinary work in preparing for paint is considerably lessened, and the usual number of given coats now reduced, and, once fairly introduced in the market, I am certain there will be a large sale. J. WM. STEVENS, Architect and Surveyor.

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may be used in connection with entertainments in the hall. The dining-hall on the first floor, a handsome room with wood-panelled walls, is reached both from the Buchanan Street entrance and from St. George's Place by a gallery through the present news-rooms; with the exception of the service-room and main staircase, it covers the entire site and gives a dining area more than double that of the present restaurant; it is served by dinner and service (passenger) hoists from the kitchen in the top floor of the building. This administrative department consists of a very large kitchen, large pantries and sculleries, larders, storerooms, chef's private room, bakery, &c., fitted with every modern convenience for the rapid and economic service of a large restaurant. It contains, also, a servants' hall, with servants' dining-room and lavatory, all served by the service (passenger) elevator. The billiard-rooms are similar to those of the present building in St. George's Place, and give accommodation for six tables. The music-rooms are mostly small to suit private teaching, and, while they are constructed so far as possible to prevent the occupants of the one interfering with those of the other, more importance has been attached to grouping all the music class-rooms together in the new building, so that all other classes may be confined to the present building, where they will not be disturbed by the music. The gymnasium, with its dependencies, like the restaurant, covers the entire site, and has an open floor space of 85 feet by 30 feet 6 inches, of which 60 feet by 30 feet 6 inches is 25 feet high and lighted from the roof, and the remainder, having an outlet to Buchanan Street, is fitted with every modern apparatus for the development of the body. The club-master's private room is close to the main entrance door. The dressing-rooms are ample, and have bath and lavatory accommodation. A gallery for spectators is carried along one side of the higher part of the gymnasium. The whole building is to be ventilated by forced draught, and is to be lighted by the electric light, from the installation in the basement of the present building in St. George's Place. So much accommodation has only been obtained by raising the building to a considerable height above the street, and the building in Buchanan Street will rank among the highest of our public buildings. The floors in the main building vacated by the dining-rooms and the billiard-rooms will be remodelled as classrooms for the Commercial College, and the news-room, library and secretary's offices will remain undisturbed in the St. George's Place building. The elevation to Buchanan Street is in sympathy with the design of the original building and in keeping with the character of the institution—at once a social club and an educational establishment. The cost of the extension, it is estimated, will amount to about 15,000*l*. The architects are Messrs. J. Burnet, Son & Campbell, the measurers Messrs. J. Dansken & Purdie, and the clerk of the works Mr. Thomas Douglas.

MESSRS. YOUNG & MARTEN'S NEW PREMISES.

WE have recently visited the premises occupied by Messrs. Young & Marten, at Stratford, and should have been pleased to have also passed to their branches at Walthamstow and Leytonstone, but so extensive are the Stratford establishments, and so interesting their contents and the processes therein carried out, that the day passed away before we realised the time we had spent. We were struck by the compact little firing kilns which they have erected for firing the stained-glass. It is appropriate here to make a few remarks about stained-glass windows and stained-glass for other purposes. For many commercial purposes and also for private houses stained-glass is in demand; for the latter purpose chaste designs on whole sheets are required, and many beautiful samples are shown in the stained-glass department. For what we may call fancy stained-glass work, made of many pieces to suit any required design, this firm has special facilities, inasmuch as the work is designed in their offices, and the glass after staining, fired on the premises and subsequently there annealed in a suitable oven.

We must not, however, be carried away by the high art department, but unwillingly relinquish it for those which are all useful and some ornamental. In the Broadway, Stratford, the ground floor, which is almost wearisome in its great extent, is devoted chiefly to ironmongery and castings; but to leave it with this remark would not be doing it justice. We would not hurry through it, but chose to notice the quality of goods in stock. The castings, which include grates, gratings, rails, gates, rain-water pipes, heads and the concomitant fittings are undoubtedly of excellent quality. After passing through long corridors lined with these articles, corrugated and other iron sheets, we had a moment's rest in the engine-room, wherein is fixed the dynamo by which the current is supplied to light the whole of the premises in the Broadway. On the ground-floor there are also storerooms for paper-hangings and wall decorations on a very extensive scale. On the first floor are excellent show-rooms, devoted in part to gas-fittings of all descriptions and globes. On this floor we also find a selection

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of ranges and fireplaces with overmantels. These are worthy of very careful examination. Made of iron they present all the appearance of marble or granite, and show to the experienced eye the perfection to which this class of ironwork has been brought—to the inexperienced eye they would pass for the material they represent; when fixed few could discriminate between this work and marble from its appearance. On the second floor one part is used as a show-room for ranges and fireplaces, but the back part is given up for the necessary offices, comprising the counting-house, the estimating department and the drawing office; this is well chosen, for those who have to deal with designs and estimates know how necessary it is for the proper execution of their work that they should as far as possible be isolated from the interruptions of current business.

Leaving the Broadway establishment, we will now refer generally to some of the other departments we visited; that connected with stained-glass we have already mentioned, and so we will turn to the plumbers' brasswork and the sanitary appliances. There is an exceedingly good assortment of baths for fixing in bathrooms, and this has now become a very important trade, for even low-rented houses must now be fitted with such baths or they will not find tenants, and Messrs. Young & Marten show baths to suit all sizes of houses. The introduction of the small bathroom during the past twenty years has certainly exercised a civilising and healthful influence upon those classes who previously were debarred from the enjoyment of a comfortable warm bath on their own premises for lack of the necessary privacy, which in former times could only be insured by an expensive and spacious lavatory. In the metal stores we wended our way amongst piles of lead-piping, other allied material, and bar, sheet and galvanised iron.

In the space at our disposal it would be impossible to do justice in the way of description to the immense amount of material stored in the warehouses through which we passed, so extensive that tramways are laid in some parts whereon run trolleys to convey materials from one part to another; but we must not overlook the wharf at Stratford Market, called the Caledonian Wharf and situate on the Channelsea River. We may mention that this is a tidal river, though often mistaken for a canal by those unacquainted with the topography of this interesting district. Connected with the wharf is Messrs. Young & Marten's extensive trade in timber, slates, lime, cement, bricks and other rough materials used in every branch of the building trade.

Having touched lightly upon the various departments which were the object of our visit, we may point out the advantage to builders of having within a comparatively small radius so many depôts under the control of one firm. Most of the litigation that now arises is due to the subdivision of contracts, which in many cases means a subdivision of responsibilities. If the principal contractor has to obtain his materials from a number of firms independent of, or perhaps antagonistic to, each other, it is scarcely likely that the work, when completed, will be satisfactory. We have had ample experience of the troubles arising from this source, and think that Messrs. Young & Marten supply us with a relief, inasmuch as, furnishing all the requirements for the trade, we can hold them responsible for all articles supplied, from a "leaded cathedral light" down to the cement used for the cathedral foundations. This is a very heavy responsibility; but from what we have seen at Messrs. Young & Marten's Works we do not think they need shrink from it.

BUILDERS' BENEVOLENT INSTITUTION.

THE forty-fourth annual meeting of this Institution took place on Thursday, July 23, at the new offices, No. 35 Southampton Row, Bloomsbury Square, W.C. Mr. William Shepherd (president) occupied the chair, and amongst those present were Messrs. B. E. Nightingale, Thomas Stirling, W. J. Mitchell, W. Scrivener, E. B. Ellis and other friends of the charity.

Major Brutton (secretary) read the report, which stated that seven pensioners had died and four others had been elected, there being now twenty males and thirty-four females dependent upon the fund. The committee took the opportunity of earnestly impressing upon the subscribers, and those who had not hitherto assisted, that to maintain so many pensioners liberal annual subscriptions and donations were requisite from the members of the building and kindred trades. Unless this was complied with the number of pensioners would have to be reduced, or the yearly stipend curtailed. It was also the case that the usual annual contributions did not admit of the election of all who, by force of necessity, were compelled to seek the benefits of the charity, and, should the income not be increased, this difficulty could not be overcome. The receipts for the past year had been sufficient to meet the expenditure, largely owing to the exertions of the president (Mr. Shepherd), to whom the

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committee expressed their obligations. The annual dinner will take place, by the favour of the Worshipful Company of Carpenters, in their hall on Thursday, November 5, when Mr. B. E. Nightingale, who has consented to accept the position of president of the Institution for the ensuing year, will preside.

The Chairman moved the adoption of the report, which was seconded by Mr. Thomas Stirling and unanimously agreed to.

The Chairman also proposed the following addition and amendment to the rules:—Rule 2, section 1*a*—"A firm shall exercise all the advantages of donations given in its own name, so long as any one of the original donors remains in the firm."

The motion was duly seconded, and agreed to *nem. con.*

Cordial votes of thanks were passed to the president, vice-presidents, trustees, treasurer, committee and auditors.

The Chairman then proposed that Mr. B. E. Nightingale be the president for the ensuing year.

Mr. W. Scrivener seconded the resolution, which was cordially received, Mr. Nightingale promising to do his utmost for the interests of the charity.

A hearty vote of thanks was passed to the Chairman for presiding, and the meeting separated.

WATERFORD CATHEDRAL.

THE cathedral of the Blessed Trinity, Waterford, has been re-opened after extensive improvements and alterations, which were commenced in January 1890. After the destruction of the ancient Danish and Anglo-Norman cathedral of Waterford in 1773, the use of maintaining the church distinctively as a cathedral church, with its services distinctive from those of parish churches, fell into abeyance. The new church was erected on the prevailing model in London of various churches built subsequent to the Great Fire, and adapted more to the importance of hearing sermons that the maintenance of choral worship. The Classic style in which it was designed by John Roberts in 1773 has been respected, and the important alterations that have been made are a development of the capabilities of the original building and its greater adornment rather than any violation of its original conception. The removal of the galleries must obviously be an improvement, and what consistently follows, the building up of the lower range of windows and the effective lighting from the upper windows is striking. The church was curtailed for congregational use, and its interior perspective view marred by its being divided into two sections, and the maintenance of a separate hall or vestibule, called a "nave," had no relation to a cathedral character. It has now been opened to the church by a great arch, and is incorporated with it for congregational purposes. With the removal of the cross-wall and the cross-gallery came the removal of the organ to the east end and neighbourhood of the choir. With it went also the dark closets called "stalls," formerly under the gallery.

At the east end of the church the new choir fittings are of solid oak. The chancel floor is of Italian mosaic, after the architect's general plan. The arms of the See of Waterford and the device of the capitular seal appear on either side, and a curious emblem of the Trinity is adapted from an ancient one found on a token among the ancient burials in Christchurch, Dublin. The altar rails are of gilded wrought ironwork, of Italian design, executed by Messrs. Singer & Sons, of Frome, Somerset, and are surmounted by a handsome brass rail. The sanctuary walls are lined with red Cork marble and carved Caen stone, as a dado that corresponds with the pedestals under the nave columns. On the walls will be placed two marble tablets, one of which states that the sanctuary floor is a memorial of the late Mr. and Mrs. Meara, of May Park. On the other will appear the following short memorial of the cathedral:—"The Danish Christchurch, or cathedral of Waterford, was founded here by Ragnvald, son of Sigtryg, the Norseman, circa 1050. It was extended by a choir and adorned by the Anglo-Norman invaders in the Early English style, circa 1220. There were added to it in the fourteenth and fifteenth centuries Trinity parish church and the chapels of St. Nicholas, St. Saviour, St. Catherine and St. James. These buildings, the foundation whereof yet remains beneath the present floor, were pulled down in 1773. The new cathedral completed 1773—John Roberts, architect; partially destroyed by fire, 1818; altered, adorned and adapted to cathedral use, 1891—Thomas Drew, R.H.A., architect." The old tesselated marble floors have been relaid in the long central passage from the west end to the choir. Arrow marks cut in the old flagging of the side aisle have been found, which indicate where the limit of the Anglo-Norman choir formerly was and the west end of Trinity Church began, and probably has reference to ancient rights of burial. The west entrance doorway, not yet erected, will have some association of interest. A more imposing portal of modern design might have been conceived, but it has been decided to accept the gift of the

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Board of Trinity College, Dublin, of a doorway, some 180 years old, recently removed from the college library, and made of stone from Scraboh mountain, co. Down. When restored and set up it will be consistent in style at least with the cathedral. Architraves have been added to the windows, formerly rude apertures in the walls, and the windows have been filled with mullions and new glazing of leaded cathedral glass. The walls have been coloured in two tints, divided by a carved cornice taken from the old gallery front. The nave has been reseated with newly-constructed benches out of the materials of the old ones. The monuments have been cleaned and restored throughout, and great care has been taken that no relic of the old cathedral should be necessarily removed from it. Mr. A. P. Sharpe, Dublin, has been the contractor for the whole work at a cost of about 4,000*l.* The carving is by Mr. Henry Emory, of Dublin. The lectern, modelled by him, is executed by Messrs. McLoughlin, brassworkers, of Dublin.

THE BIRMINGHAM HYDRAULIC STATION.

ON Saturday, the 18th inst., the Mayor of Birmingham, in company with Sir Thomas Martineau and other members of the City Council, opened the hydraulic station which has been constructed in Dalton Street for the purpose of supplying hydraulic lifts with a higher pressure of water at a reduced cost both to the consumer and the Water Department of the Corporation. The Mayor, prior to starting the works, pointed out that sixty years ago there was no water-supply in the hardware village of Birmingham—a name which was fully justified at that period. London had a public water-supply in Queen Elizabeth's reign, and if one looked back at what the cities of Italy did in bringing water from very long distances, it must be admitted that Birmingham was then behind the times. August 1831 was the date of the first public water-supply in the town. It was needless to recapitulate what had been done in that direction since that time. The supply had been increased from year to year as the necessity arose. It was in 1888 that the committee first had under consideration the further development of the supply as it affected hydraulic lifts, but nothing was definitely done until March 4, 1890, when a report was presented to the Council recommending a new high pressure of 700 lb. to the inch, instead of 70 lb., the idea being to effect economy both for the Water Department and for the owners of hydraulic lifts. This matter was still in its infancy, although there were mains laid down through a few of the central streets, where naturally land was most valuable, and buildings accordingly consisted of more storeys than in the outside districts. He thought there was a great future for the system, judging from the use it was put to in London and Liverpool. Mr. Gray stated that more rent was obtained for some of the upper floors of the high buildings in these cities because the lifts made them easy of access, and they were quieter and cleaner than the lower floors. He (the Mayor) hoped the Council would put a good hydraulic lift in the Council House, for the demand for rooms on the ground floor was in excess of the accommodation, whilst there was a large amount of space in the upper storeys which might be used if such a lift was provided.

Alderman Sir Thomas Martineau said he believed the step they were now taking in the Water Department was a new departure for municipal corporations. It was not on so large a scale, of course, as some of the departures taken by Birmingham in the past, but it was a new one for a corporation to take. There had been establishments of the kind set up in some towns, but the work had been in the hands of public companies. He wished to point out that the inauguration of this movement was forced upon the Water Committee by the necessity of economising the water. For some time past there had been lifts in the centre of the town, and as they increased with the lofty buildings erected it became necessary to increase hydraulic pressure. In the five years between 1885 and 1890 the number of lifts had been doubled, and the enormous expenditure of water involved was a strain upon the domestic supplies. Hence the present system was developed with a view to economising the water consumed, so that now the lifts could be better and more cheaply supplied at one-tenth of the water formerly used. The first cost of constructing lifts served by the hydraulic power would be much less than formerly, and there would be a great saving in the working of the lifts, while the supply would be more regular and powerful than hitherto.

Mr. Gray, the engineer, at the request of the Mayor, gave a brief explanation of the works. He pointed out that a lift which now cost 16*l.* or 17*l.* a year would cost 13*l.* under the present system, and the saving to the department would be the difference between the cost of 7,000 and 70,000 gallons of water. It would pay consumers to alter their machines so that they could adopt the new system, which would be less costly and the lifts would be worked at more speed. The saving on a lift now costing 25*l.* a year would be about 9*l.* a year. Mr. A. R. Dean

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was the first to have his lifts worked by the higher pressure, and his lift would go up a distance of 60 feet in half a minute.

The machinery was then set in motion and inspected by the company.

THE LAW OF "COMMON EMPLOYMENT."

ON Tuesday in the House of Lords, before Lord Herschell, Lord Watson and Lord Morris, the important case of Johnson (pauper) *v.* W. H. Lindsay & Co. was heard.

This was an appeal from a decision of the Court of Appeal affirming a judgment of the Divisional Court. The action, says the *Times*, to which we are indebted for the following report, which raised a question of great importance as to the extent and operation of the doctrine of common employment, was brought by the appellant, a workman in the employ of Messrs. Higgs & Hill, to recover damages for personal injuries which he sustained through the alleged negligence of the servants of the respondent, who were at the time of the accident engaged in carrying out a contract for the construction of fireproof flats and floors in a building which the appellant's employers were erecting. The respondents disputed the appellant's claim, on the ground that he was engaged with their servants in a common employment. At the trial the jury found a verdict for the appellant, with 50*l.* damages, but that verdict was set aside and judgment entered for the respondents by the Queen's Bench Division, Mr. Justice Manisty, who took part in the judgment, remarking that the question as to the common employment was a very large and important one, and expressing a hope that it would be decided by the House of Lords. The decision of the Divisional Court was subsequently affirmed, on appeal, by Lord Justice Cotton and Lord Justice Lopes, the majority of the Court of Appeal, Lord Justice Fry dissenting. The case was argued some time ago, when judgment was reserved.

Lord Herschell, in the course of his judgment, said :—The ground upon which judgment was entered for the respondents was that the plaintiff at the time of the accident was engaged in a common employment with the servant of the defendants, whose negligence led to the disaster, and that the defendants, therefore, could not be held liable for his negligence. This renders it necessary to examine the facts relating to the employment of the appellant, and of the person whose negligence was found by the jury to have caused him injury It appears that Messrs. Higgs & Hill had entered into a contract with the Workmen's Dwellings Association, of which Mr. Burden was architect, to erect a block of buildings according to the specification furnished by him. The specification on which the contract was based contained a provision in these terms :—

"Provide the sum of 215*l.* net to be paid Messrs. Lindsay & Co., of the Paddington Iron Works, No. 14 South Wharf, Paddington, or any other firm approved by the architect, for fireproof flats and floors to roofs and laundries laid and fixed complete. The contractors are to allow Messrs. Lindsay the use of their scaffolding, and to provide them any needful attendance for the carrying out of their work, and are to work with them as may be necessary for the due despatch of their work. The work in respect of which this provision is included is to be carried out in accordance with a specification and instructions to be furnished by the architect."

It also contained the following clause :—"Power for other tradesmen to perform works. In order to carry out those works specified to be executed by other tradesmen, and for which provisional amounts are included in this estimate, the contractors are to allow free access to the premises and all reasonable facilities to such tradesmen for carrying out the several works reserved for them to perform."

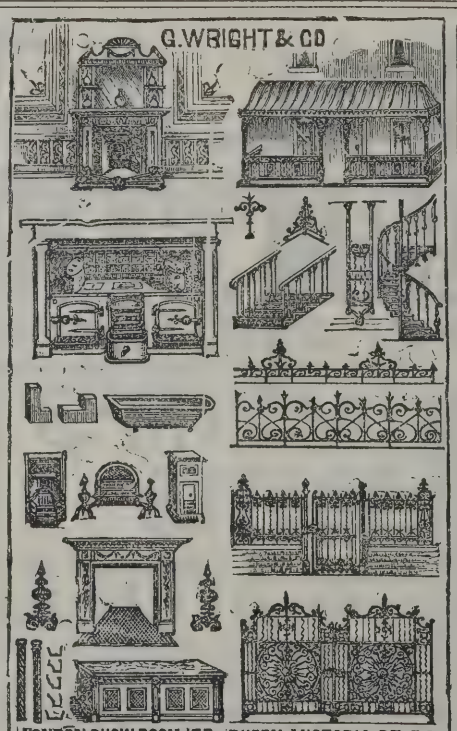
Prior to the contract with Higgs & Hill being entered into, the architect of the building owners had obtained an estimate from Messrs. Lindsay & Co. for the fireproof flats and floors, the amount of estimate, which was headed "Workmen's Dwellings Association Company, R. H. Burden, Esq., architect," being the sum of 215*l.*, for which, as above mentioned, Higgs & Hill were to make provision in their estimate for the work upon the basis of which the contract with them was shortly afterwards entered into. The only other facts necessary to be stated are that there were, as far as appears, no communications between Higgs & Hill and Lindsay & Co. before the latter commenced their work, and that it was the architect who advised them that the buildings were sufficiently advanced to enable them to commence the work for which they had given him an estimate. It should be added that payments were made to Lindsay & Co. through Higgs & Hill. Upon this state of facts it is, I think, clear that the appellant was in no sense the servant of Lindsay & Co. It follows, therefore, that, if it is essential to the defence of common employment that the person suing should himself be the servant of the master by whose servant's negligence the injury has been caused, the defence cannot be sustained in the present case. And, upon a review of the authorities, I am unable to entertain any doubt that this is essential. Lord Cranworth, in delivering his opinion in this House in the case

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of Bartonshill Coal Company *v.* Reid, thus states the rule established in this country :—

"When several workmen engage to serve a master in a common work, they know, or ought to know, the risks to which they are exposing themselves, including the risks of carelessness against which their employer cannot secure them, and they must be supposed to contract with reference to such risks."

The law is laid down in substantially the same terms by Lord Blackburn in Howells *v.* Landore Steel Company (10 L.R. Q.B. 62), and by Chief Justice Erle in Hall *v.* Johnson (3 H. and C. 594), who, in delivering the judgment of the Exchequer Chamber, said :—"The case falls within the principle established not only in this country, but also in Scotland, Ireland and America, that a servant, when he engages to serve a master, undertakes, as between himself and his master, to run all the ordinary risks of the service, including negligence on the part of a fellow-servant when he is acting in the discharge of his duty as a servant of him who is the common master of both."

And in the recent case of Swainson *v.* North-Eastern Company, Lord Bramwell said :—"We must consider what obligations a servant takes upon himself. It is sometimes said that he contracts to take upon himself the risks of his service, but the proposition may also be stated as follows, namely, that he has not stipulated for a right of action against his master if he sustains damage from the negligence of a fellow-servant. The two forms of the proposition seem to me substantially the same : in either case it is necessary to prove that a relation has been established between the person who complains and the master of the person who does the injury."

The present Master of the Rolls in the same case thus expressed himself :—"I think that the authorities bear out the proposition laid down in the Exchequer Division—that in order to give rise to the exemption there must be a common employment and a common master. It is not necessary that there should be a common service for a definite time or at fixed wages, for the exemption exists in the case of volunteers and of other persons, where plainly there has been no contract for payment ; a volunteer puts himself under the control of another person, and in respect of that other person he is for the time being in the position of a servant."

These authorities are sufficient to establish the proposition that unless the person sought to be rendered liable for the negligence of his servant can show that the person so seeking to make him liable was himself in his service, the defence of common employment is not open to him. Such service need not, of course, be permanent or for any defined term. The general servant of A may for a time or on a particular occasion be the servant of B, and a person who is not under any paid contract of service may, nevertheless, have put himself under the control of an employer to act in the capacity of servant, so as to be regarded as such. This, as has been pointed out, is the position of a volunteer. But it is obvious that if the exemption results, as it does according to the authorities I have cited, from the injured person having undertaken, as between himself and the person he sues, to bear the risks of his fellow-servant's negligence, it can never be applicable when there is no relation between the parties from which such an undertaking can be implied. There are other considerations which point in the same direction. It must be remembered that whilst a servant contracts with his master to bear the risks of the negligence of his fellow-servants there is, as has been more than once laid down, a corresponding duty on the part of the employerto take due care to select competent servants. And it would be most unreasonable to hold that he is exempt from liability for his servant's negligence in any case where he is not under this obligation. But I do not see how such an obligation can arise otherwise than from such contractual relation. The obligation and the exemption appear to me to be correlative, and to be implied from the relation of master and servant created between the parties. The language used by Lord Cairns in Wilson *v.* Merry was much pressed upon your lordships. It appears to have been supposed to countenance a wider exemption than is to be deduced from the other authorities to which I have referred. Lord Cairns, in delivering his opinion in this House, said :—

"I would only add to this statement of the law, that I do not think the liability or non-liability of the master to his workmen can depend upon the question whether the author of the accident is not or is in any technical sense the fellow-workman or *collaborateur* of the sufferer. In the majority of cases in which accidents have occurred, the negligence has no doubt been the negligence of a fellow-workman, but the case of the fellow-workman appears to me to be an example of the rule and not the rule itself. The rule, as I think, must stand on higher and broader grounds." But it is clear to my mind that when Lord Cairns used this language he was only intending to repudiate the contention put forward by the appellant in that case, that the rule applied exclusively to workmen of the same grade actually employed in a common labour, and had no

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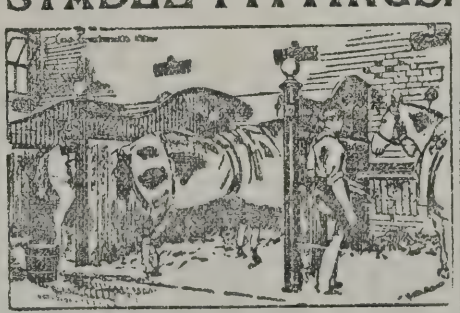
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application where the person whose negligence was complained of was in the position of a manager not taking part in manual labour, who was, in fact, the employer's *alter ego*. Other passages in the noble and learned lord's opinion indicate, I think clearly, that he did not intend to state the law differently from Lord Cranworth, whose opinion in Bartonshill Coal Company *v.* Reid he quotes with approval. It is said, however, that the case of Wiggett *v.* Fox is decisive in favour of the respondents, and this view was adopted in the courts below. With deference to the learned judges who have entertained this view, I am quite unable to concur in it. If the law there laid down would determine the present case in favour of the respondents, I should feel bound to reject it as inconsistent with all the other English authorities. The plaintiff in Wiggett *v.* Fox was the administratrix of a servant of a sub-contractor who had been employed by the defendants to do a part of the work included in their contract; it was held that he was a fellow-servant of the servant of the defendants whose negligence caused him injury, that the sub-contractor and his servants had become the servants of the contractor. The ground of this decision was explained by Mr. Baron Channell, in Abraham *v.* Reynolds, to be that it was proved that the deceased was paid by the defendants, and that the defendants had a control over and power to dismiss the plaintiff though engaged by the sub-contractor. It is unnecessary to consider whether this view of the facts was correct, though the propriety of the decision has been more than once doubted, and notably by Chief Justice Cockburn in Reurke *v.* The White Moss Colliery Company, for a decision resting on such a view of the facts can, as it seems to me, have no application to the present case. In the first place, I do not think that Lindsay & Co. were sub-contractors under Higgs & Hill; I think they had an independent contract with those who were employing Higgs & Hill. In the second place, even if they are to be regarded as in some sense sub-contractors under Higgs & Hill, I think it is impossible to say that the servants of Higgs & Hill were the servants of Lindsay & Co., or that they had put themselves under the control of Lindsay & Co. to act as their servants, or were in any way acting as such at the time of the accident. It only remains for me to notice the recent Scotch decision in the case of Woodhead *v.* the Gartness Mineral Company, which was naturally much relied on by the respondents. Lord Justice Lopes stated in the court below, I think quite correctly, that this decision carried the principle of common employment much further than was warranted by any of the English authorities, and it appears to me to be a development of the doctrine which is really in antagonism with cases which have been decided in this country. It eliminates altogether the element that the injured man and the man doing the injury must be in the employ of a common master, and treats as unimportant that which I consider to be of the essence of the exemption, that is to say, the mutual undertakings between the employer and employed to be implied from the relationship of master and servant constituted between them. I think the judgment appealed from ought to be reversed and the judgment entered for the plaintiff restored.

Lord Watson: This action was brought by the appellant for damages in respect of personal injury sustained by him through the negligence of workmen in the service of Lindsay & Co., the respondent firm. It is admitted that at the time of the accident the appellant was a labourer in the employment of the firm of Higgs & Hill, and the only defence set up by the respondents, which is now insisted on, was thus stated in their pleadings:—"The plaintiff was a workman and was a fellow-servant of and was engaged in one common service and employment with certain of the defendants' servants, who were also workmen and competent to do their work, and the said injuries, if caused by the negligence of any person or persons for whose negligence the defendants would be answerable (all of which is denied), were caused by the defendants' said servants while they and the plaintiff were such fellow-servants, and engaged in such common service and employment, and in the course thereof, and not otherwise, without any personal negligence or interference on the part of the defendants."

The terms of that plea render it necessary to determine the precise relation subsisting between the appellant and the workmen by whose negligence he was injured. The ascertainment of that relation depends, not upon conflicting testimony, but upon facts which are not controverted, and upon documentary evidence. Messrs. Higgs & Hill, the appellant's employers, were contractors for building a block of artisans' dwellings, in accordance with plans and specifications prepared by Mr. Burden, the owners' architect. Part of the contemplated work consisted of fireproof flats and floors of concrete for laundry purposes, to be completed on the "Lindsay" system, so-called in consequence of the respondents being specialists in that kind of work. In the specification the details of these fireproof flats and floors are entered under the heading, "power for other tradesmen to perform works," and there is a general provision that "in order to carry out those works specified to be executed

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by other tradesmen, and for which provisional amounts are included in this estimate, the contractors are to allow free access to the premises, and all reasonable facilities to such tradesmen for carrying out the several works reserved for them to perform." The only other obligations which the specification imposes upon the contractors with regard to the fireproof flats and floors are that they shall provide the sum of 215*l.*, to be paid to the respondents or any other firm approved by the architect, and that they shall allow the respondents or such other firm the use of their scaffolding, and provide them with any needful attendance for carrying out their work, and also work with them as may be necessary for the due despatch of their work. Mr. Burden transacted with the respondents directly and received from them an offer to execute the laundry work for 215*l.* He did not, as he explains in his evidence, absolutely bind himself to them, having reserved the right to employ another firm if he chose; but, when the building was ready for their work, he directed them to proceed with it, which they accordingly did. The respondents had no contract with Higgs & Hill, and they came under no obligation either to receive directions from that firm or in any way to submit to their control. The evidence does not show or even suggest that, in point of fact, Higgs & Hill ever attempted to interfere with the respondents' work, or to assume control over their servants who were employed in its execution. It is not disputed that the appellant was engaged and paid by Higgs & Co., or that the workmen through whose fault he was injured were engaged by, and received their wages from, the respondents. At the time when he was injured the appellant was clearing away rubbish from the lower storey of the building, in the course of his duty as the servant of Higgs & Hill, who had undertaken to perform that operation. The respondents' servants were raising buckets of concrete to the topmost storey, for the purposes of their contract with Mr. Burden by means of a pulley and tackle, supplied by Higgs & Co., as required by the specification, when, through want of due care on their part, a bucket fell upon and injured the appellant. I do not doubt that the appellant and the servants of the respondents, though engaged in different departments of work, were yet employed in furtherance of the common end of completing the block of dwelling-houses. Nor do I doubt that, if they had all been servants of the same master, the appellant would in law be held to have accepted the risk of his fellow-servants' negligence, and could have had no claim for reparation, except against the workmen who injured him. But there is, in my opinion, no ground for the suggestion that the respondents' servants were, in any sense whatever, the servants of Higgs & Hill, and therefore fellow-servants of the appellant.

(*To be continued.*)

PATENTS.

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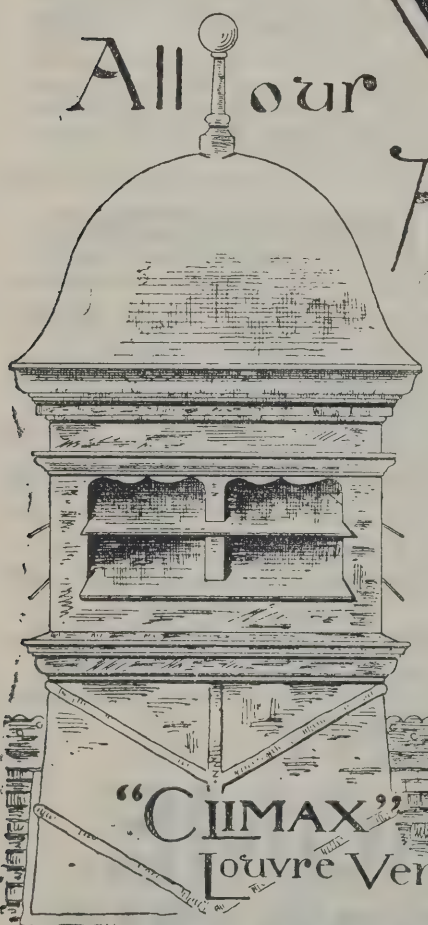
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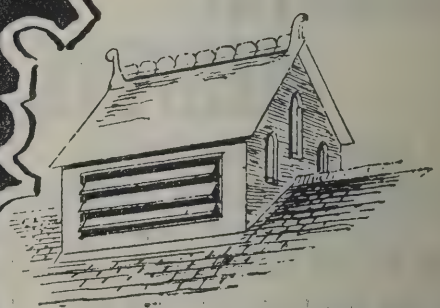
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LONDON, AUGUST 7, 1891.

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Under the Provisions of the Charter of the Surveyors' Institution, the present "Practice" qualification for admission to membership will cease after August 26, 1891.

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Surveyors, whether connected with Architecture, Engineering, Land, Building or Mining. Land or Estate Agents, resident or otherwise.

After August 26, 1891, the admission to the several classes of Professional Membership will be by Examination.

CONTRACTS OPEN.

BARKING.—Aug. 13.—For Supply of Broken Granite and Kentish Flints. Mr. C. J. Dawson, Local Board Offices, East Street, Barking.

BARTON REGIS.—Aug. 13.—For Building Master's House at Workhouse. Mr. F. W. Wills, Architect, Foster's Chambers, Small Street, Bristol.

BATH.—Aug. 13.—For Building Premises for the Lansdown Grove Hotel. Mr. T. B. Silcock, Architect, Octagon Chambers, Bath.

BISHOP'S HULL.—Aug. 13.—For Building Schoolmaster's Residence and Boundary Walls. Mr. G. C. Strawbridge, 25 Alma Street, Taunton.

BLACKHILL.—Aug. 15.—For Building Methodist Sunday School, Classrooms, &c. Mr. J. Shields, Architect, 42 Fawcett Street, Sunderland.

BRIGHOUSE.—Aug. 15.—For Building Twenty-one Houses. Mr. J. F. Walsh, Architect, Halifax.

BRIGHTLINGSEA.—Aug. 11.—For Building Battery and Drill Shed. Director of Works Department, Admiralty, 21 Craven Street, W.C.

BRIGHTON.—Aug. 13.—For Erection of Shops, Lavatories, &c., on Site of Old Police Station, Grafton Street. Mr. F. J. C. May, C.E., Town Hall; Mr. F. J. Tillstone, Town Clerk.

BUCKINGHAM.—Aug. 18.—For Building County Police Station and Lock-up House. Mr. R. J. Thomas, County Surveyor, 67 New Road, Aylesbury.

BURNOPFIELD.—Aug. 11.—For Building Pickering Nook School. Mr. J. W. Rounthwaite, Architect, Blackhill, co. Durham.

CARDIFF.—For Building Wesleyan Methodist Schools. Messrs. W. H. Habershon & Fawckner, Architects, Pearl Street, Cardiff.

CARDIFF.—Aug. 20.—For Chancel, Organ Chamber, Vestries and South Aisles to St. Catherine's Church. Messrs. Kempson & Fowler, Architects, Llandaff.

CARDIFF.—For Building Two Houses, Stables and Boundary Walls. Messrs. T. Waring & Son, Architects, 1 Charles Street, Cardiff.

CARMARTHEN.—Aug. 14.—For Additions, &c., to Wesleyan Chapel. Mr. W. J. Needle, 22 Union Street, Carmarthen.

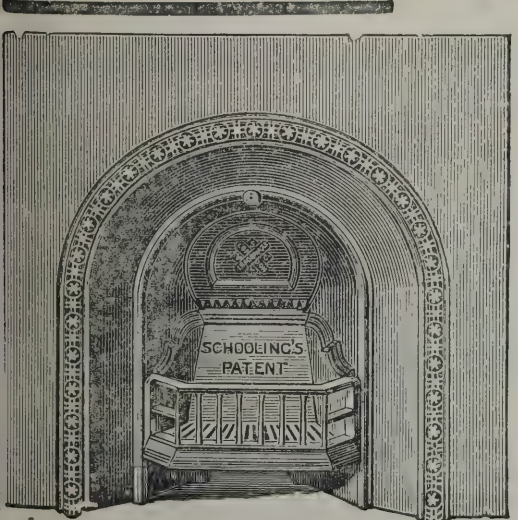
CARN BREA.—Aug. 13.—For a 90-inch Cylinder Cornish Pumping Engine, Steam Capstan, Four Cornish Boilers and Fittings. Mr. Nicholas Trestrail, Engineer, Claremont Road, Redruth.

CLAYTON-LE-MOORS.—Aug. 10.—For Building Store and Houses. Mr. Henry Ross, Architect, Birch Street, Accrington.

CLYNDERWEN.—Aug. 15.—For Building Parsonage. Mr. Ernest Collier, Architect, 4 Quay Street, Carmarthen.

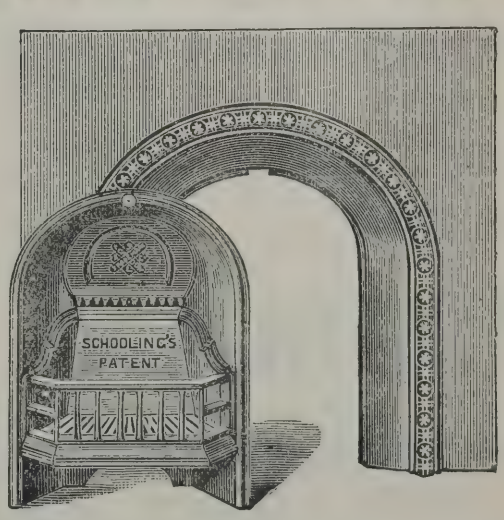
CORNWALL.—Aug. 11.—For Building Branch Bank and Manager's Residence at Helston, also at St. Colomb. Mr. Silvanus Trevail, Architect, 80 Lemon Street, Truro.

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DARTFORD.—Aug. 15.—For Boiler-house, Chimney Shaft, &c., Gore Farm Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

DENBIGH.—Aug. 31.—For Building Chancel and Alterations to St. David's Church. Mr. R. Lloyd Williams, Architect, Park Lane, Denbigh.

DEWSBURY.—Aug. 11.—For Boiler-house and Willey Place with Iron Roofs and Floor. Messrs. C. H. Marriott & Son, Architects, West Park Street, Dewsbury.

DURHAM.—Aug. 11.—For Additional Rooms to Sherburn Hospital. Mr. C. Hodgson Fowler, Architect, The College, Durham.

ELLON.—Aug. 10.—For Building Dwelling-house and Offices and Post Office Buildings. Mr. Alexander Cowie, Architect, Ellon.

FOLKESTONE.—Aug. 8.—For Supply of Road Materials. Mr. A. W. Conquest, Borough Engineer's Office, Folkestone.

GLASGOW.—Aug. 13.—For Works in Building Police Station and Barracks. Mr. J. Lang, City Chambers, Glasgow.

GRAMPOUND ROAD.—Aug. 8.—For Additions to High Street School, St. Stephen's. Mr. Silvanus Trevail, Architect, Truro.

HALIFAX.—Aug. 15.—For Building Four Houses and Works at Moorfield Lodge. Mr. T. L. Patchett, Architect, George Street Chambers, Halifax.

HAYWARD'S HEATH.—Aug. 28.—For Additions to Ward at County Lunatic Asylum. Mr. Henry Card, County Surveyor, Lewes.

HERRINGTON.—Aug. 10.—For Building Houses for Curate, &c., adjoining Church. Mr. J. G. Cowe, Architect, Lambton Office, Fence Houses.

HOOK NORTON.—Aug. 11.—For Building Hotel. Mr. G. Ferris, Milton Manor, near Pewsey, Wilts.

ISLINGTON.—Sept. 12.—For Building Public Baths and Washhouses. Mr. A. Hessel Tiltman, Architect, 70 Torrington Square, W.C.

KENWYN.—Aug. 10.—For Building Vestry to Church. Messrs. Henderson & Son, Architects, 31 Lemon Street, Truro.

KING'S HEATH.—Aug. 14.—For Building Petty Sessional Court, with Cells, Residences and Other Buildings. Mr. H. Rowe, County Surveyor, Worcester Chambers, Pierpoint Street, Worcester.

LEEDS.—Aug. 8.—For Construction of Urinal, Wellington Street. The Borough Engineer.

LEEDS.—Aug. 8.—For Building Weights and Measures Office, Kirkgate Market. The Borough Engineer.

LEEDS.—Aug. 19.—For Exhauster-house at Gasworks. The Resident Engineer, Gasworks.

LEOMINSTER.—Aug. 21.—For Building Free Library. Mr. F. R. Kempson, Architect, Bromyard.

LEWES.—Aug. 22.—For Supply of Broken Granite. Mr. Arthur Holt, Town Hall, Lewes.

LEWISHAM.—Aug. 10.—For Constructing Road and Sewer. Mr. H. A. Alexander, 72 Cannon Street, E.C.

LEYTONSTONE.—Aug. 10.—For Painting, &c. Mr. W. T. Howard, Guardians' Offices, Bishop's Road, Bethnal Green, E.

LONDON AND NORTH-WESTERN RAILWAY.—Aug. 11.—For Construction of Goods and Coal Depôt, London, and Enlarging Station at Armitage. The Engineer, Euston Station.

MORLEY.—Aug. 26.—For Building Town Hall, Municipal Offices, Police Courts and Offices. Messrs. Holtom & Fox, Architects, Dewsbury.

NETLEY.—Aug. 14.—For Painting. Lieutenant-Col. E. M. Larminie, Royal Engineer Office, Gosport.

NEWPORT.—Aug. 17.—For Building Church at Barnard Town. Messrs. W. Graham, Son & Hitchcox, Architects, Victoria Chambers, Newport, Mon.

NEWPORT.—Aug. 17.—For Construction of Brick and Pipe Sewers. Mr. F. W. B. Waterworth, Town Hall, Newport, Isle of Wight.

NEW WORTLEY.—Aug. 18.—For Construction of Urinals, Water-closets, &c., at Gasworks. The Resident Engineer, Gasworks, Leeds.

NORWICH.—Aug. 13.—For Completing New Hospital. Mr. P. P. Marshall, City Engineer, Norwich.

PRESTON.—Aug. 10.—For Barn, Stable, Carthouse and Bridge, for the Guardians. Mr. James Clarke, Union Offices, Preston, Lancashire.

RUSHDEN.—Aug. 12.—For Additional Bedrooms for the Hotel Company. Mr. H. H. Dyer, Architect, Newland Chambers, Northampton.

SHOTLEY BRIDGE.—Aug. 15.—For Constructing Evaporating Furnaces. Messrs. John Annandale & Sons, Shotley Bridge.

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SOUTHAMPTON.—Aug. 7.—For Building Twelve Cottages. Mr. W. Burrough Hill, Surveyor, 62 Above Bar, Southampton.

SOWERBY BRIDGE.—Aug. 10.—For Building Six Houses. Mr. S. Wilkinson, Architect, Sowerby Bridge.

STAFFORD.—Aug. 11.—For Building Coal Stores. Mr. J. F. Bell, Engineer, Gasworks, Stafford.

SUTTON-IN-ASHFIELD.—Aug. 17.—For Constructing Service Reservoir. Mr. George Hodson, Engineer, Abbey Buildings, Westminster, S.W.

WAKEFIELD.—Aug. 7.—For Constructing Sewers. Mr. Frank Massey, Tetley House, Kirkgate, Wakefield.

WESTMINSTER.—Aug. 7.—For Painting. Mr. J. Waldram, Surveyor, 13 Buckingham Street, Charing Cross, W.C.

WOODFORD.—Aug. 8.—For Supply of Broken Granite. Mr. J. D. Hooper, Local Board Offices, Woodford Green, Essex.

YEOVIL.—Aug. 8.—For Building Turret to Town Hall. The Borough Surveyor.

TENDERS.

BIRKENHEAD.

For New Street and Improvement Works, Birkenhead. Mr. T. C. THORBURN, Borough Surveyor.

L. Marr & Son, Liverpool	£2,648 11 5
W. F. Chadwick, Liverpool	2,233 0 11
J. Jones, Birkenhead	2,167 8 5
Sterling & Swann, Manchester	2,090 0 0

BURTON-ON-TRENT.

For Building Temporary Hospital. Mr. J. E. SWINDLEHURST, Borough Surveyor, Burton-on-Trent.

J. & T. W. Selby, Burton-on-Trent	£487 10 0
Corrugated Ironwork.	
Dixon & Co., Liverpool	164 0 0

CAPECASTLE.

For Constructing Limekilns at Capecastle, for the Capecastle Lime Works Company. Mr. GEORGE BRADSHAW, Architect, Railway Station, Ballymoney.

Gault Bros., Ballymena	£691 0 0
A. McNaster, Ballymoney	664 0 0
H. MCCANN, Ballymena (*accepted*)	637 0 0

BURRADON.

For Alteration and Extension of the Burradon Branch Premises, for the Cramlington District Co-operative Society. Mr. J. G. CRONE, Architect, 50 Grainger Street, Newcastle-upon-Tyne.

R. Veitch, Newcastle-upon-Tyne	£496 1 6
E. & R. Symmons, Forest Hall	473 0 0
E. Spence & Co., Blyth	459 17 6
W. Lilburn, Blyth	450 0 0
H. Brown & Co., Newcastle-upon-Tyne	444 8 0
A. Grey, North Gosforth	425 0 0
R. NICHOLSON, Forest Hall (*accepted*)	396 10 0

CARDIFF.

For Erection of New Waterworks Depôt, Penarth Road, for the Cardiff Corporation. Mr. J. A. B. WILLIAMS, M.I.C.E., Engineer. Quantities by Messrs. Veall & Sant, Cardiff.

D. J. DAVIES, Cardiff (*accepted*)	£2,799 0 0

For Constructing Sewers, Cardiff.

J. C. Pearson	£6,473 9 3
J. ALLAN (*accepted*)	6,356 0 3
T. Rees, jun.	6,189 7 8
Painting Bridges.	
T. R. Bradbury	471 10 8
W. Davies	288 12 5
A. J. Howell	453 14 10
DALY & CO. (*accepted*)	287 4 1

CWMAMAN.

For Building Thirty Workmen's Houses, Cwmaman, Aberdare, for the Cwmaman Building Club. Mr. D. W. JONES, Surveyor, Cwmaman Colliery, Aberdare.

Powell & Mansfield, Barry	£265 0 0
A. Meredith, Newbridge-on-Wye	256 0 0
Williams & Davies, Pontypridd	198 0 0

HARROGATE.

For Building Detached House, Billiard-room and Stabling, Walker Road, Harrogate, for Mr. W. H. Baxter. Messrs. H. E. & A. BOWN, Architects, Harrogate.

Accepted Tenders.

J. Schofield, Sons & Co., Leeds, mason.
Rainforth & Hudson, Harrogate, joiner.
G. Lazenby, Leeds, plumber and glazier.
C. Fortune, Harrogate, plasterer.
W. Shevill, Leeds, slater.
G. Dent, High Harrogate, painter.

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DOVER.

For Construction of Belgrave Road, Dover. Mr. W. THOMAS, Borough Engineer.

W. Bromley, Dover	£227 18 10
H. Richardson, Dover	227 4 7
H. STIFF, Dover (*accepted*)	176 10 0

HERTFORD.

For Building Hall and Sunday Schoolrooms for Congregational Church, Hertford. Mr. JAS. FARLEY, Architect, Hertford. Quantities by Mr. T. P. Pietersen, Hampstead Road, N.W.

Wade, St. Neots	£1,222 0 0
Willmott & Sons, Hitchin	1,200 0 0
French & Ellwood, Westminster	1,173 0 0
Dupont, Colchester	1,159 0 0
Ginn & Son, Hertford	1,137 0 0

JESMOND.

For Parochial Buildings, Jesmond. Messrs. PLUMMER & BURRELL, Architects, Newcastle-on-Tyne.

S. B. BURTON, Newcastle-on-Tyne (*accepted*)	£1,496 18 1

LIMERICK.

For Restoration of South Aisle, Chapels, Tower, &c., of St. Mary's Cathedral, Limerick. Mr. R. FOGERTY, Architect, Henry Street, Limerick.

J. Hayes, Limerick	£2,685 3 9
J. Pemberton & Son, Dublin	2,500 0 0
J. RYAN & SON, Limerick (*aceepted*)	2,451 0 0

LONDON.

For Decoration of Large Hall, Council Chamber and Committee Rooms, for the Chelsea Vestry.

		Oils instead of Distemper.
J. Griffiths	£663 1 6	£62 4 6
Dunn	660 14 4	86 4 0
J. Beattie	656 0 2	44 13 6
Lilly	648 0 0	61 0 0
W. Furniss	644 14 0	164 0 0
H. Scharien & Co.	598 0 0	36 0 0
Oetzmann & Co.	597 0 0	111 15 0
W. Dudley	588 6 9	75 12 0
Marolda	573 19 10	47 19 4
Simmons Bros.	554 4 0	61 9 0
Highway & Depris	548 9 3	47 3 8
Nightingale	493 0 0	56 0 0
MINTER (*accepted*)	449 0 0	15 0 0

LONDON—*continued.*

For Building and Fitting Laundry, for the Guardians of St. George-in-the-East.

A. Martin	£5,503 17 0
Pennock	4,884 0 0
C. Cox	4,412 0 0
J. Edmonds	4,388 19 2
W. Johnson & Co.	4,250 0 0
G. E. Todd	4,085 0 0
J. HOLLAND (*accepted*)	4,037 0 0

For Masons' Work and Repairs to Mortuary, Church and Chapels, Superintendent's Lodge, &c., at Camberwell Cemetery, Forest Hill Road. Mr. R. P. WHELLOCK, Architect, 45 Finsbury Pavement, E.C.

R. Avard, Maidstone	£2,264 0 0
G. Parker, Peckham	1,825 0 0
A. Yeatman, Peckham Rye	1,698 0 0
T. Lye, Sutton	1,339 0 0
W. V. Goad, Camberwell	1,280 0 0
Tomes & Wimpey, Hammersmith	1,205 0 0
W. RICHARDSON, Brixton (*accepted*)	1,107 0 0

For Alterations and Additions to Stables, &c., Beauvoir Wharf, Kingsland, for the Vestry of the Parish of St. Leonard, Shoreditch. Mr. ALFRED J. MARTIN, A.R.I.B.A., Surveyor to the Vestry.

Thomerson & Son, Hackney	£1,824 10 0
Staines & Son, Great Eastern Street	1,788 0 0
Seath & Harris, Bartholomew Close	1,749 5 0
Ivory, Great Cambridge Street	1,663 0 0
Todd, Hackney Road	1,640 0 0
STEED, Chalk Farm (*accepted*)	1,522 0 0
Edwards, Mowlem Street	1,519 0 0

For Alterations and Additions to Laundry at Schools, Elder Road, West Norwood, for the Lambeth Guardians.

Higgs & Hill, Lambeth	£1,194 0 0
E. S. & T. J. Wallis, West Norwood	1,175 0 0
Thames Bank Iron Co.	1,095 0 0
Hall, Beddall & Co., Pitfield Wharf	1,090 0 0
H. Young & Co., Pimlico	1,070 0 0
Gould & Brand, Camden Town	1,065 0 0
Fraser & Fraser, Bromley-by-Bow	987 0 0
J. & F. May, High Holborn	956 0 0
Z. D. BERRY & SONS, Westminster (*accepted*)	928 0 0

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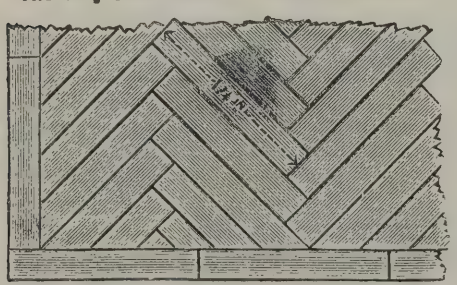
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The Tivoli Theatre
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Hotel Windsor, and others
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LONDON—*continued.*

For Building Premises for the Stockwell Branch of the London and South-Western Bank and Alterations of adjoining House, Nos. 256 and 258 Clapham Road, S.W. Messrs. TOLLEY & SON, Architects. Quantities by Messrs. Parr & Son.

Whitehead & Co.	£4,775 0 0
F. & H. Higgs	4,650 0 0
Gould & Brand	4,600 0 0
Candler & Sons	4,500 0 0
J. & C. Bowyer	4,397 0 0
W. Shepherd	4,390 0 0
Smith & Sons	4,387 0 0
Bryan & Son	4,341 0 0
Rice & Son	4,335 0 0
W. Rowe	4,165 0 0
W. Marriage	4,100 0 0
J. Carmichael	4,035 0 0

For Additions and Alterations to Premises, 470 Brixton Road, for Messrs. Peter & Evans. Mr. G. WARREN COOPER, Architect, Bedford Row House, Bedford Row.

Drew & Cadman	£1,337 0 0
Peacock Bros.	1,256 0 0
Young & Lonsdale	1,189 0 0
Dickerson	1,146 0 0
Triggs	1,100 0 0

For Distempering, Painting and Other Work at South-Western Fever Hospital, Landor Road, Stockwell, for the Metropolitan Asylums Board. Mr. T. W. ALDWINCKLE, Architect.

L. Whitehead & Co., Clapham Road	£290 0 0
W. G. Lilly, Whitcomb Street	279 0 0
M. Batchelor, East Maidstone	264 5 0
G. Smith, Hammersmith	250 0 0
W. J. Penfold, Upper Sydenham	235 9 7
F. C. STOKES & Co., Walworth (*accepted*)	187 0 0

For Repairs to Offices, &c., for the Guardians of St. Giles, Camberwell. Mr. R. P. WHELLOCK, Architect, 45 Finsbury Pavement.

G. Parker, Peckham	£415 0 0
W. V. Goad, Camberwell	387 0 0
Stokes & Co., Walworth	341 0 0
R. & E. Evans, Peckham	309 0 0
F. P. TREWEEKE, Peckham (*accepted*)	305 0 0

MALVERN LINK.

For Works at Sewage Farm, Malvern Link. Mr. LOWCOCK, Engineer, Birmingham.

Currall & Lewis	£1,113 0 0
J. Biggs	1,075 0 0
T. Vale	995 0 0
G. Law	897 0 0
G. Webb	847 0 0
Jones & Fitzmaurice	800 0 0
H. HUGHES & SON (*accepted*)	706 1 11
J. Jevons	693 9 11
Engineer's estimate	760 0 0

MIRFIELD.

For Construction of Pipe Sewers (860 yards), Mirfield. Mr. F. H. HARE, Surveyor.

J. W. Blackburn, Mirfield	£511 12 0
G. Pearson, Scholes	413 17 2
Slinger & Naylor, Cleckheaton	401 15 9
GARFORTH BROS., Mirfield (*accepted*)	374 9 0

PAISLEY.

For Building Three New Properties in Lady Lane, for the Paisley Provident Co-operative Society.

Philpot & Watkins, mason	£2,151 10 2
Gavin Kerr, joiner	1,410 9 1
John Fraser, plasterer	384 0 0
Bell & M'Lauchlan, bricklayer	382 15 0
Wm. Glover, plumber and gasfitter	274 8 1
Gillespie & Son, slater	77 10 0

SWANSEA.

For Building Vaccination, Relief and Pay Stations, for the Guardians of Swansea Union. Mr. J. THOMAS, Engineer, 32 Fisher Street, Swansea.

C. Walters	£211 0 0
Thomas, Watkins & Jenkins	225 0 0
D. Thomas	242 10 0
S. Wood	250 0 0
BENNETT BROS. (*accepted*)	196 0 0

SWINDON.

For Alterations to Premises, High Street, Old Swindon. Mr. R. J. BESWICK, Architect, Swindon.

W. Chambers, Swindon	£245 0 0
J. Williams, Swindon	232 0 0
T. Barrett, Swindon	212 0 0
W. H. FORD, Swindon (*accepted*)	205 0 0

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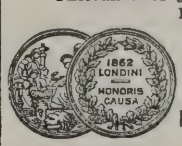
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SWINDON—*continued.*

For Building Shop and Warehouse, Commercial Road, Swindon, for Mr. Longland. Mr. R. J. BESWICK, Architect.

T. Barrett, Swindon	£868 0 0

SOWERBY BRIDGE.

For Building Church School, Sowerby Bridge. Messrs. HORSFALL & WILLIAMS, Architects, Halifax.

J. Turner, Warley, mason.
W. E. Boocock, West Vale, joiner.
J. Stafford, Sowerby Bridge, plumber and heating apparatus.
T. Dyson, Sowerby Bridge, plasterer and slater.
S. Mallinson & Son, Sowerby Bridge, painter.
S. Wadsworth, Sowerby Bridge, ironfounder and railing.
W. Bullough, Halifax, asphalting.

Total cost, exclusive of fittings and furnishings, £4,315.
58 tenders were received.

TADCASTER.

For Enlargement of Workhouse Infirmary, for the Guardians of Tadcaster Union. Mr. HODGSON DENHAM, Surveyor, Aberford.

G. Bilbrough, Tadcaster	£440 8 6
Wilson & Son, Castleford	419 6 6
THOMPSON & SON, Sherburn (*accepted*)	385 10 0
M. Harrison, Tadcaster (brickwork)	210 0 0
E. Jackson, Tadcaster (joiner only)	120 0 0
Harrison & Co., York (joiner and painter only)	110 0 0
Railway & Son, York (plasterer only)	26 10 0
W. Leach, Boston Spa (slater only)	15 10 0
Surveyor's estimate	392 12 11

TYLDESLEY.

For Building Infant School and Classroom, with Out-offices, School Street, Tyldesley-with-Shakerley. Mr. C. L. WHITEHEAD, Architect, 144 Market Street, Chowbent.

		If Ruabon Bricks.
J. Cocker, Walkden	£1,200 0 0	£1,250 0 0
J. Langley, Chowbent	1,143 0 0	1,183 0 0
T. Challinor, Tyldesley	1,130 0 0	1,172 0 0
T. Grundy, Chowbent	1,135 0 0	1,170 0 0
J. HAMPSON, Tyldesley (*accepted*)	1,045 0 0	1,110 0 0

WORCESTER.

For Erection of Main Building of New Workhouse.

J. WOOD & SONS (*accepted*)	£22,429 10 0

Lowest of eight tenders.

WILLESDEN.

For Works for the Willesden Local Board. Mr. O. C. ROBSON, Surveyor.

Steel Girder Bridge, Neasden Lane.

A. Thorne, Cannon Street	£1,491 0 0

Road-making, Kilburn.

G. Bell, Tottenham	591 0 0

Sewer, Harlesden.

R. Ballard, Hendon	357 0 0

BUILDING AND BUILDERS.

A SUPPER was recently given at the Lion Hotel, Caerhowel, by Colonel Harrison, to the men employed upon the works at Caerhowel Hall, which is now undergoing alterations and considerable enlargement, under the direction of Mr. W. H. Spaull, F.R.I.B.A., Oswestry, the contractor being Mr. W. H. Thomas, Salop Road, Oswestry. The chair was occupied by Mr. Frank H. Shayler, assistant architect to Mr. Spaull.

THE Bombay Corporation, the *Indian Engineer* says, recently met to discuss the building by-laws, with a view to preventing in future jerry-building, which has had such fatal results within the last few years. Mr. Gostling, the architect who had given scientific evidence in the recent cases of collapse, attended to advise the Corporation. One draft by-law provided for the use of good bricks and stone, good mortar, good lime, clean sharp sand, good cement. Mr. Gostling thought the adjectives in each case unnecessary, as the materials mentioned, to be worthy of the name at all, must be good. Dr. Viegas moved the omission of these words, and by a majority it was carried. Colonel Mereweather, R.E., then proposed that since they gave builders, by this resolution, permission to use whatever kind of material they chose, the draft by-laws now before the Corporation be abandoned. Colonel Wilson left the meeting by way of protest, and a further resolution to omit the word "good," as applied to foundations, was carried. Further discussion was postponed.

STEPS are being taken for the erection of a Conservative club at Bedworth. The building, which will be erected on a plot of ground adjacent to the Coventry Road, will include a reading-room, billiard-room, a large room for meetings, &c., capable of holding some 400 persons. The estimated cost is 600*l.*

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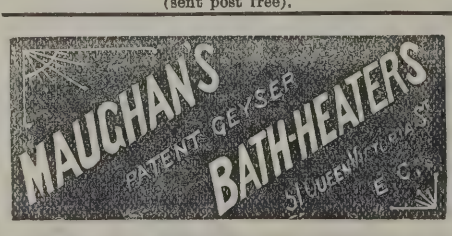
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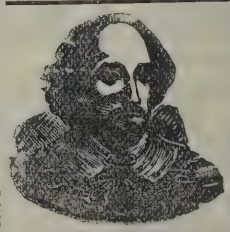


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NEARLY two years ago the foundation-stone of a new church at Barmouth was laid. The site, a shelf of rock above the arcade, was levelled, and upon it a handsome structure has been gradually approaching completion. Through a fault in the rock the weight of the masonry has caused a slight subsidence at one corner, and a crack is visible in the wall. Precautions have been taken to prevent any further injury to the church by surrounding the foundations with several tons of concrete.

THE iron church at the foot of the Windmill Hills, Gateshead, after doing duty for some fifteen years, is to be replaced by a permanent structure. The architect of the new church is Mr. Stephen Piper, County Chambers, Newcastle, and the building will consist of nave, transepts, chancel, chancel-aisle, organ-chamber and vestry, with heating-chamber underneath. The aisles are arranged so as to admit of future extension, but at first they will be used as passages.

THERE was a large and representative attendance of builders present at the burial of the late W. H. Cowlin, of Bristol, which took place at Arno's Vale Cemetery. Among them were Mr. E. T. Hatherly, president of the Bristol Master Builders' Association; Mr. Hayward, president of the Bath Master Builders' Association; Mr. F. J. Dove, of London, of the National Master Builders' Association. The Bristol Society of Architects was represented by the president, Mr. H. Crisp and Mr. W. E. Jones, hon. secretary.

RAPID progress has been made in the restoration of Dunblane Cathedral. The choir has been in use for many years, the nave has been roofless till now for three centuries. It was found that the tops of the choir wall were more decayed than was expected, and part had to be taken down and rebuilt. This is now finished. In the south wall of the choir there are six large windows, and the tracery on the top of the four in the centre has been altered to correspond with what is considered the original. The east gable, containing the great east window, is surmounted on both sides by a small turret or spire.

TRADE NOTES.

WE understand that Messrs. John Gibbs & Son's patent "Weatherproof extractors" have been used for ventilating the new lying-in ward for the Toxteth Union, of which Mr. W. W. Thomas, of Liverpool, is the architect.

A NEW church has been erected at Alnmouth, and the ventilation has received the most careful consideration, the extraction of the vitiated air being effected by the direct-acting turret ventilator of the Climax Ventilating Company, 15 Great George Street, Westminster, treated so as to make it a feature of the building.

A VERY handsome stained-glass west window has just been erected in St. James's Church, Antrim Road, Belfast, in memory of the late Sir John Preston, by his widow and family. The window, which is universally admired, was executed at the Hogarth Studios, Fitzroy Square, London.

AT the sale by auction, on the premises of the Irish Portland Cement Company, Dublin, of the machinery, plant, sheds, &c., employed in the manufacture of the cement, among the lots sold were the chief engine for 400*l.*, the boiler for 200*l.*, the driving shafting apparatus for 150*l.*, the second engine for 100*l.*, and boiler in connection for 90*l.* Sixty-five tons of cement fetched 149*l.*, three stone-breakers fetched from 40*l.* to 53*l.* each, and a pulveriser 65*l.* The pipes in connection with the boilers brought 100*l.* It is stated that the principal part of the machinery is purchased with the intention of restarting the works.

THE Watch Committee of the Worcester City Council recommend the appointment of a canvasser for the purpose of ascertaining how many of the inhabitants are likely to take electric light if provided.

THE Birkenhead Health Committee recommend the Council to construct two refuse destructors, one in Birkenhead and the other in Tranmere.

AT the meeting of the Birmingham Board of Guardians the following tenders were accepted:—From Messrs. Currall & Lewis for 48*l.* 17*s.*, for repairing the boundary wall at infirmary; and from Messrs. Norton & Co. for 575*l.*, for painting the exterior of the infirmary.

MESSRS. R. WAYGOOD & CO., lift manufacturers, of Falmouth Road, Great Dover Street, S.E., on the Friday before the Bank Holiday arranged an outing for their employés on what may be called the blue-ribbon system, so as to avoid the risk of harmony being upset by the too free indulgence of their men in intoxicating drinks. Messrs. Waygood & Co. defrayed the expenses also, in order to discourage the application for donations from other firms. Any canvass for such donations was prohibited, but the company invited not only

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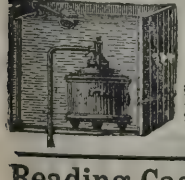
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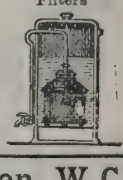
A visit to our Show Rooms will be esteemed a favour. If inconvenient to call, send for one of our Illustrated Catalogues, inspect our Designs, and read our Testimonials.

Trusting to receive your favours, which shall have our prompt attention,
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.
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Water-Testing Apparatus for detecting Impurities in Water, 10*s.* 6*d.* and 21*s.* each.
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their employés, but the wives and children also, to take part in the excursion. The party had their outing to Richmond, where, at the Castle Hotel, about 430 sat down to dinner. The afternoon was spent in amusements, a good tea being provided later, and on the return London Bridge was reached at 10 P.M. The system is one that might well be adopted universally, though we should be sorry to think that all depends on the blue-ribbon system for the preservation of harmony.

THE Town Council of Aberdeen have agreed to spend 675*l.* on the lowering of the levels in Union Terrace, with the view of completing the improvement now being carried on in that locality. The Council deferred in the meantime the proposal to spend 37,000*l.* on the improvement of the Gallowgate.

THE Birmingham Markets and Fairs Committee have accepted the tender of Mr. C. H. Horton, of Church Street, Brierley Hill, for the construction of the new pig-market in Montague Street.

THE Aberdeen Town Council have sanctioned the erection of a new canteen at Castlehill barracks, at a cost of 1,760*l.*, the contractors being Messrs. D. Macandrew & Co.

AMERICAN NOTES.

THE Charleston, S.C., *News and Courier* says:—The forests of the south are falling like wheat before the reaper's scythe. The annual area of destruction is measured by thousands of square miles. The "progress" in this field is a steady and rapid march toward the ruin of our forest resources, which are being "developed" off the face of the earth. The finest timber lands remaining in the country are being swept of their trees, without regard to their real value or to the future needs and prosperity of the section to which they belong, and the work of devastation is being done with the consent and by the hands of the people of the south themselves. Acres of wood land are sold for the price of a few trees growing on them, and their owners as a rule are content to part with their inheritance for the small compensation they receive for cutting down the trees and carting them to the nearest saw-mill. The business is a paying one for the north, of course, but it is a reckless waste so far as the south is concerned.

THE Wheeling (West Virginia) planing-mill men and builders report, the *North-Western Lumberman* says, the largest building season that the city has ever known. There are many new business houses in course of construction and no end of small dwellings. The cost of the buildings erecting and to be erected this season is estimated at about 1,000,000 dols., with a good prospect that that sum may be exceeded.

AS the result of a recent survey of the railway bridges in the State of New York, 669 have been condemned and 130 will require to be entirely rebuilt. There are in all 2,000 bridges, but in America it must be remembered the use of wood for bridges is general.

THE new 125-ton steam-hammer just completed by the Bethlehem Iron and Steel Company, Bethlehem, Pennsylvania, is said to be the largest ever built. The hammer was designed by Mr. John Fritz, superintendent of the company, and stands some 60 feet high. It covers a floor surface 42 feet square, and is of the usual A-frame construction. The steam cylinder is 6 feet 6 inches in diameter, and has a stroke of 16 feet 6 inches. The total weight of piston, piston-rod, ram and die amounts to 125 tons. The anvil is made up of twenty-two solid cast-iron blocks, averaging about 70 tons each in weight. The anvil-block upon which the material is to be hammered is faced with steel, and measures 11 feet in length, 6 feet in width at bottom, 2 feet in width at top, with a depth of 4 feet 6 inches.

THE *Engineering Record* says:—Joseph Thompson, a well-known contractor and builder, died at New York on July 16. He superintended the construction of the Mutual Life Building, the United States Trust Company's Building and the Wilks Building in Wall Street, and at the time of his death was in charge of the erection of the Greenwich Savings Bank.

THE Welsh societies of Chicago, the *Journal of Commerce* says, have been quietly perfecting arrangements to hold in this city, during the World's Fair, their national feast of music and literature, the Eisteddfod. To this end it is necessary to build an auditorium with perfect acoustic and optical properties and capable of seating 20,000 persons.

THE largest compound pumping engine ever built at the Lehigh Valley shops at Hazleton, Pa., the American *Manufacturer* says, is now ready to be shipped to York Farm colliery. Its weight is 100,000 lbs., or 50 tons, and its estimated cost to the company is 6,349 dols. It has power to raise water 450 feet perpendicular, and will be placed in position at the York Farm mine. The Hughes Steam Pump Company, Cleveland, O., lately put in an immense pump in an iron mine at Iron Mountain, Mich., of 2,000,000 gallons capacity, style, compound condensing, 24-inch high pressure, 40-inch low pressure, 12-inch

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outside pack plungers, 18-inch stroke, using air pump and condenser; weight, 24 tons. This pump is raising water 500 feet through a 12-inch pipe, and giving unquestioned satisfaction.

THE first experiment in electric railways in Minnesota outside of city passenger traffic is to be made between Stillwater and St. Paul, twenty-four miles. It is intended to have the road in operation for both freight and passenger traffic by October 1.

IT is proposed to build an electric road to Price Hill, a western suburb of Cincinnati, at a cost of 150,000 dols.

A STEEL bridge is being constructed by the Union Pacific across the Columbia river at Vancouver, Wash. The length from the Washington to the Oregon shore will be 6,000 feet, and the draw pier will be over 400 feet long. The cost of the structure will be over 4,000,000 dols.

ANOTHER Leary raft, the largest ever floated, containing 3,500,000 feet of lumber, and far exceeding its predecessor, known as the Joggins raft, has reached New York in safety from St. John, New Brunswick. The lumber of which it consists would have loaded up thirty-five ordinary schooners engaged in the trade. This raft was towed in sections connected with chain cables.

VARIETIES.

THE Improvement Committee of the Halifax Corporation have decided that it is necessary to apply to the Local Government Board for a provisional order to alter, repeal and amend such of the local Acts in force within the borough as relate to new streets and buildings.

IT is stated that there have recently been a considerable number of cases of lead-poisoning at Whitwood and Hightown, part of Whitwood Mere township. The water used is from Wakefield. Iron pipes are now being substituted for lead pipes.

THE plans, &c., for the supply of the high levels of Killiney with Vartry water by means of pumping have been approved by the commissioners, who have decided to apply for a loan of 1,500*l.* to defray the cost of the work.

THE recommendation of the General Works Committee to purchase from Mr. George Worton his property in Earl Street at the price of 2,000*l.*, being part of the site required for the proposed new municipal buildings and public improvements, has been confirmed by the Coventry City Council.

IN connection with the proposed erection on the Market estate of a new technical school for Batley, Messrs. G. & J. Stubley, woollen manufacturers, have offered a subscription of 500*l.*, on condition that 3,000*l.* be raised.

PLANS have been prepared by the county surveyor, Mr. Vickers Edwards, for a new bridge over the Aire between Shipley and Baildon, estimated to cost 4,000*l.*

THE Local Government Board have sanctioned a loan of 3,650*l.* for the purpose of forming a new public cemetery for Rhyl.

A CLAIM against the Hull Corporation of 50*l.* in respect of each of 22 houses alleged to be depreciated in value by the construction of the Argyle Street bridge over the North-Eastern Railway, at Hull, has been decided by Mr. T. B. Thompson, C.E., arbitrator, who finds that the value of the property has been depreciated by the interruption of a free current of air, and by the erection of the bridge generally. He has awarded 8*l.* 10*s.* for each house.

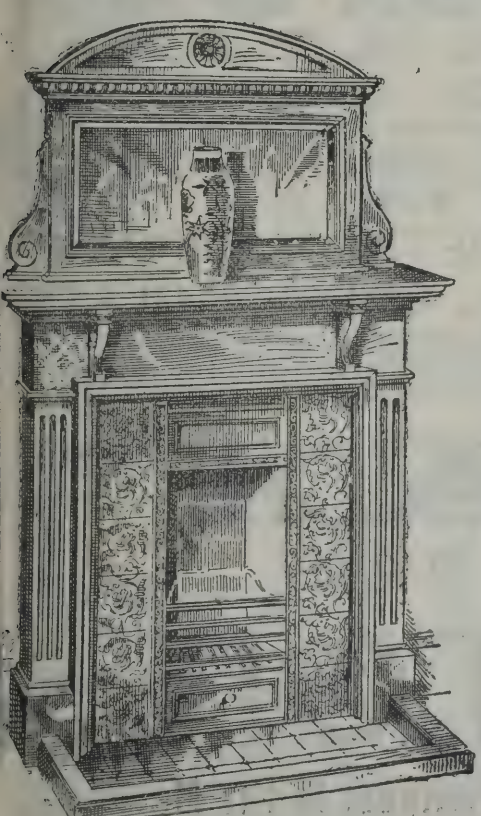
UNDERGROUND workings on the estate of the Duke of Hamilton, are, it is reported, responsible for damage being done to the Town Hall and Burgh Buildings. The walls of the hall show several large cracks varying in length from 1 to 6 or 7 feet. The number and sizes of these fissures are becoming greater. The commissioners are negotiating for the purchase of the minerals below the buildings which have yet been left untouched, for the purpose of insuring their safety. It is supposed the damage already done has been caused by a "draw" subsequent to the workings in the vicinity.

AT the meeting of the Mines Drainage Commission, a letter was read from Mr. T. Hawksley resigning his position as arbitrator. Mr. Wilson Lloyd, chairman, regretted that Mr. T. Hawksley was resigning, for he was an able man, and had rendered great assistance to their engineers. He was a clever water engineer. The Chairman said all the arbitrators would resign, and new ones would have to be appointed under the new Act.

THE Corporation of Glasgow have purchased forty acres of ground adjoining Alexandra Park, with a view, it is understood, to the extension of the park. The price paid for the ground is 200*l.* an acre, being 8,000*l.* in all.

THE magistrates of Moffat have received a further remittance of 1,000*l.* from the executors of the late Mr. William

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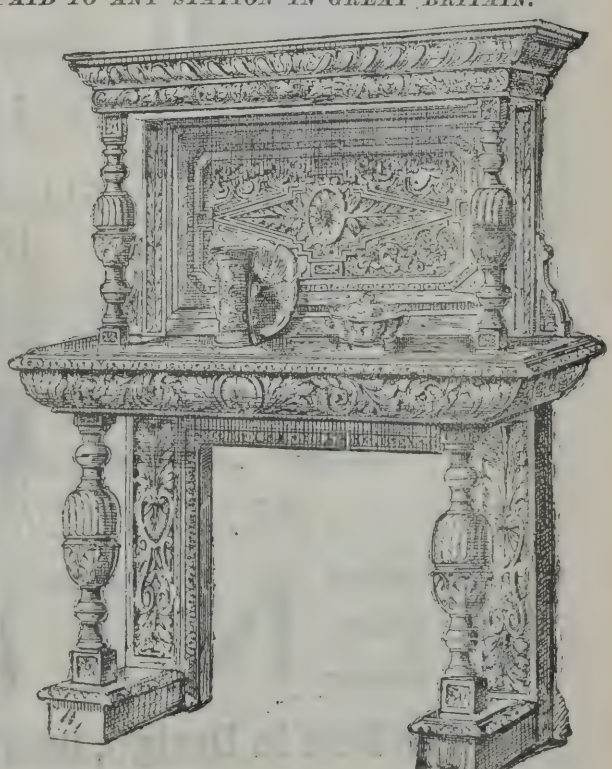
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Proudfoot, of Natal and Craigieburn, Moffat, "for the benefit of the working men of Moffat."

THE Guardians of Alcester decided to engage Mr. Pritchard, C.E., to make an inspection of the Astwood Bank district, with a view of obtaining a supply of water for that place.

THE First Scholarship and First Prize at the Royal Agricultural College, Cirencester, has just been won by Mr. Arthur Noël Whitley, only son of the Director-General of the German Exhibition, for the fifth term in succession. He has also, for the second year in succession, gained the college challenge cup for athletic sports, and has been elected captain of the college football team for the coming winter.

THE "ECLIPSE" PAINT REMOVER.

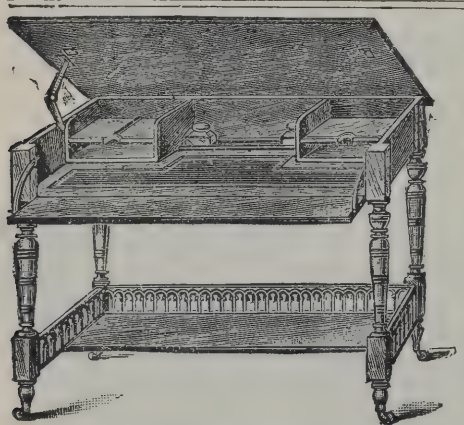
WE have received sample tins from the proprietors of the above speciality, and can, from actual test, recommend it as a most efficient paint remover. It is prepared as a paste, the application of which immediately removes old hard paint of any thickness, enamel, varnish, and wall-paper from wood, stone or iron. It is also used for taking paint from baths, as well as from old wood-carvings. It is a disinfectant, and will not injure the surface or the paint afterwards applied; while as to price, we believe it compares favourably with any other in the market. These qualities should recommend the "Eclipse" Paint Remover to decorators, builders and others. The proprietors are The "Eclipse" Paint Remover Co., 1A Crescent, Minories, London, E.C., from whom samples and particulars can be obtained on application.

AUDLEY WATERWORKS.

NEW waterworks just completed at Audley, Staffordshire, have been formally opened. The parish, which contains a population of about 16,000, consists of a number of villages, scattered over the mining district of North Staffordshire. It was found necessary to obtain the water from the sandstone formation below the level of the deepest mines in the immediate neighbourhood in order to secure a constant and pure supply. In consequence of the scarcity of water, the local board some years ago adopted a partial scheme by which one part of the district was supplied; this has now been extended and the system just completed provides for a daily supply of 260,000 gallons. The works were planned by Messrs. Ford & Slater, surveyors, of Burslem, and the machinery was designed and constructed at Union Foundry, Kidsgrove, Staffordshire, now one of the branches of Messrs. Woodhouse & Rawson United, Limited, of 88 Queen Victoria Street, London, under the supervision of Mr. C. E. Masterman, A.M.I.C.E., the works manager. The pumping machinery is capable of delivering 20,000 gallons per hour into the high-service reservoir, through three miles of leading mains from a depth of 530 feet.

The pump-well is 100 feet deep, and is lined through with cast-iron tubbing in bracketed segmental rings each 5 feet deep and averaging ⅜ inch thick. This tubbing is belled out to a diameter of 7 feet at the top, where provision is made for receiving the guides by cast-iron girders and slide-boxes. There is a borehole 100 feet deep at the bottom of the well. The pump, which is of peculiar construction, is driven direct from the triplethrow crank-shaft by three long wrought-iron pump-rods attached to the bucket and crosshead. It consists of two buckets working in one gun-metal-lined barrel, the lower bucket being actuated by the centre pump-rod of wrought-iron which passes through the upper bucket and through a hollow steel sleeve. This sleeve is screwed into the upper bucket and also to the underside of the crosshead to which the two outer wrought-iron pump-rods are attached, thus enabling the upper bucket to work in a contrary direction to the lower one, and giving a continuous flow of water through the working barrel. The valves of the buckets are so constructed as to partly rotate at each lift. The water delivered from the pump is forced through one of Masterman's patent diaphragm condensers, fixed below the floor, fitted with "Credenda" steel tubes and having a cooling surface of 390 square feet. Immediately outside the engine-house is a cast-iron air-vessel, also a retaining valve and a relief valve, the latter weighted to release at a pressure of 300 lbs. per square inch. A "byepass" is arranged from the pump to the air-vessel by which the water can be carried past the condenser if it is desired to work the engine at high pressure.

The mains, which are of cast-iron, are of the spigot and socket type, and range in diameter from 8 inches downwards. They are about thirteen miles in length, and are provided with suitable valves and fire connections. The engines are of the compound coupled type, fitted with the above-described condenser, and are of 110 indicated horse-power when working at their normal speed of 75 revolutions, with a boiler-pressure of 70 lbs. The high-pressure cylinder is 12 inches bore, and the



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low pressure 22 inches, each having a stroke of 2 feet. They are steam-jacketted, lagged with mahogany and bound with brass bands. An] "Acme" governor fixed on the steam-chest regulates the steam-supply. Slipper-guides are attached to the ends of the piston-rods, and the connecting-rod and shaft-bearings are of gunmetal of ample size. The eccentric rods are constructed of steel tubes, and the shaft is of best hammered iron, while the three-throw crank-shaft is driven by a mortice wheel which takes motion from a pinion geared in the ratio of three to one. Steam is generated in two Cornish boilers each 6 feet diameter by 24 feet long, made of best Staffordshire plates and tested by hydraulic pressure to 120 lbs. per square inch; these are fed by a Cameron donkey pump placed in the engine-house and drawing water from a wrought-iron hotwell outside the house. In addition to this there are auxiliary pipes attached to the boiler-feed to prevent any possible interruption to the supply of feed-water. An arrangement in the roof of the engine-house facilitates the drawing out of the pump-rods when the buckets require changing, and a travelling-crane is fixed over the engine in order that any part of the machinery may be easily moved.

NORTH BRITISH ASSOCIATION OF GAS MANAGERS.

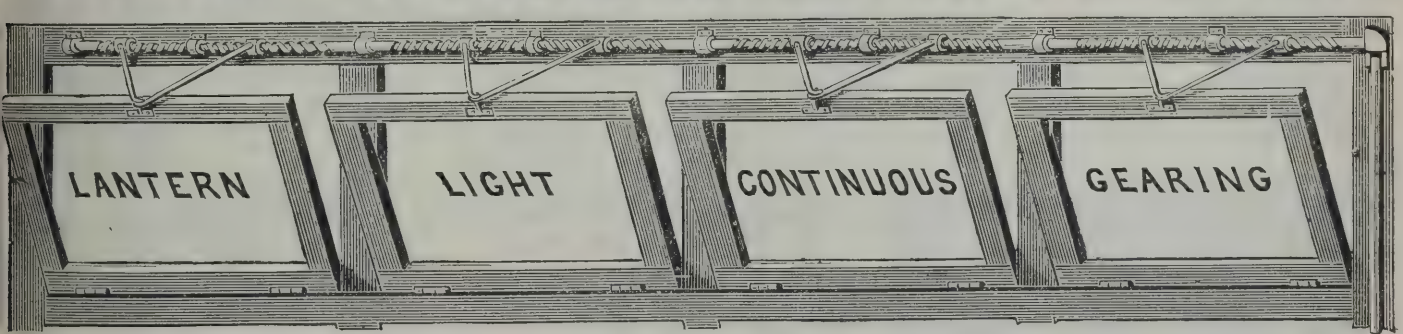
THE annual meeting of the North British Association of Gas Managers was held in the Victoria Room, Edinburgh, on the 23rd ult. There was a large attendance, presided over by Mr. R. Robertson, Bathgate. It was reported that the membership numbered 233, of which 151 were ordinary members, 61 extra-ordinary, 5 honorary and 16 associates. The funds were reported to be in a satisfactory condition.

Mr. J. M'Gilchrist, Dumbarton, on behalf of the Murdoch Memorial Fund, stated that the fund now amounted to 317*l.* 17*s.* 6*d.* Next year, being the centenary of the introduction of gas lighting, it was resolved to apply for leave to erect a bust to Murdoch, who was its pioneer, in the Wallace Monument, Stirling. This, it was explained, would not exhaust all the funds of the committee, and it was hoped that a still more worthy memorial to Murdoch might yet be erected.

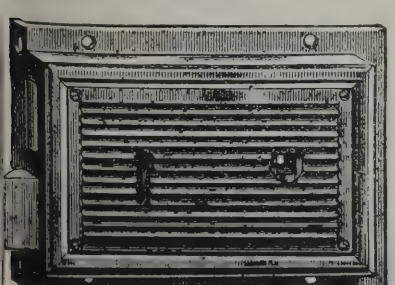
A letter was read from Mr. Samuel Stewart, Greenock, last year's president, regretting his inability, through illness, to attend the meeting. Mr. D. Bruce Peebles, Edinburgh, resigned the office of auditor, and was elected an honorary member.

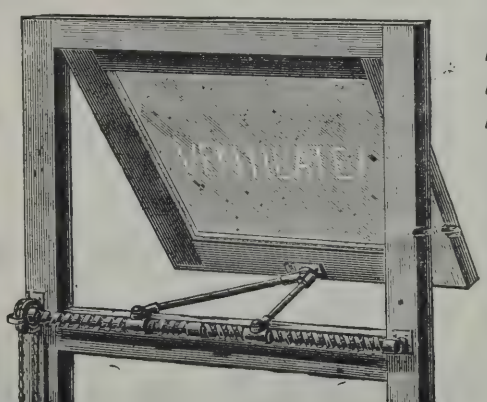
The President, in his opening address, said it was matter for congratulation that the demand for the commodity they manufactured and sold was still largely on the increase, notwithstanding the encroachments of rival illuminants, and that gas stocks were to day as firm as ever they were. They rejoiced that a good part of the increase was due to day consumption. The prejudices against gas as a cooking agent had been gradually removed, and what was claimed by them years ago was now admitted on all hands—that gas is the most economical, convenient and clean mode of cooking yet introduced. Looking from the past success of gas to its future, and remembering that this success up to the present had been due to its cheapness, reliability and convenience, they might question themselves as to the possibility of this increasing demand being reversed. They need not consider the possibility of any rival illuminant ousting gas on the score of reliability and convenience. What concerned them most was the danger of a decreased demand, induced by a necessity for raising the price to such a point as would give the more expensive and brilliant light a chance to supplant it. To reduce the present high standard of luminosity by the use of cheaper coal, that gas might be kept at a low price, would, in his opinion, be a false step, in the face of the continued demand for more light. The efforts put forth by their American brethren to produce gas of high luminosity, so as to compete more favourably with the electric light, confirmed the opinion of the majority of Scottish gas managers that the high standard illumination ought to be maintained, and showed them that there was perhaps, after all, a great amount of truth in what the chairman of one of the electric light companies said in explanation of the non-success of the new light in Scotland, namely, that it was there met by a strong competitor in the shape of the rich coal-gas supplied. Being brought face to face with the difficulty of producing a rich gas at a cheap rate, when cannel is rising in price, it was gratifying to see that there was a possibility of the removal of that difficulty. The activity shown by gas managers and chemists to practically apply the old theory of enriching coal-gas by oils was significant. That the difficulties hitherto encountered in that direction would ultimately be overcome they had not the least doubt. Success in that, combined with more economical methods of working, would enable gas to hold its own as the cheapest light for years to come. Unless the cost of producing electric light could be very much cheapened, they had no reason to fear its encroachments either in private dwellings or in their streets; and

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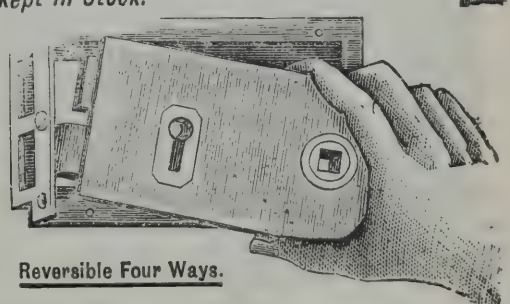
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cheapening seemed scarcely possible when they considered that at the present time over 90 per cent. of the power expended is converted into light. The labour trouble still clung to them, and it seemed that a solution of that difficulty would not be arrived at in a hurry. The spirit of unrest among gas workmen, as well as in other departments of labour, kept up by the paid agitator, was a matter of anxiety to the gas manager.

Mr. G. B. Hislop, Paisley, read a paper on "A new form of Gas Burner, especially adapted for gas-testing purposes." Mr. Hislop showed by experiments that in the majority of burners the orifices are usually drilled at much too high an angle for producing the greatest amount of luminosity. In a discussion which followed, Mr. Mitchell, Edinburgh, said he thought the burner shown was not so suitable for Edinburgh gas as for lower quality gas. Mr. A. Macpherson, Kirkcaldy, said there was nothing which would tend more to give satisfaction to gas consumers than a proper set of burners constructed on the principles which had been advocated by Mr. Hislop, suitable for all the different qualities of gas, and that those burners should be supplied to gas consumers by the companies or corporations. Mr. J. West, Manchester, said that every gas-burner ought to be governed, and in addition gas managers should educate their consumers as to what burners to use.

Mr. J. West, Manchester, then read a paper on labour-saving appliances in connection with mechanical stoking. He mentioned that one of his most recently fitted-up machines was in the Aberdeen Gasworks, which, he believed, had led to a great saving of cost in the retort-house. A discussion followed, in which Mr. Valon, Mr. W. Key, Mr. D. Terrace, Mr. T. D. Hall and others took part, all the speakers uniting in the opinion that Mr. West's machinery in Aberdeen, which they had all seen, worked most efficiently.

About two o'clock the meeting adjourned, and the company walked to the Edinburgh Gasworks, where they were received by Councillor Kinloch Anderson, who gave the gas managers a hearty welcome on behalf of the Edinburgh and Leith Gas Commissioners. On resuming, it was reported that the ballot for the election of office-bearers had resulted in the following being elected:—President, Mr. A. Macpherson, Kirkcaldy; vice-presidents, Messrs. T. D. Hall, Montrose, and Wm. Key, Tradeston Gasworks, Glasgow; committee, Messrs. J. M'Gilchrist, Dumbarton; Levi Monck, Partick, Hillhead and Maryhill Gas Company's works; and Alexander Smith, Aberdeen; secretary and treasurer, S. Carlow, Arbroath.

Mr. G. Love, Paisley, read a technical paper on "Experience on the construction and working of Regenerative Retort Settings." Mr. David Robertson, Dunoon, read a paper on "Unaccounted-for Gas," in which he gave it as his opinion that the cause of the unaccounted-for gas was chiefly to be found in the great leakage in service pipes and meters. Mr. W. Kay, Glasgow, said that in a town where he was once gas manager, they had two wet meters, both in the police office, which controlled the all-night and the half-night lamps. The gas company put on dry meters, and in the first year their account for gas consumed in the public lamps doubled itself. After that they found it to go down, and he and his assistants set themselves to ascertain scientifically what was the cause. They required to get goloshes, and with the aid of these they found that the police were in the habit of turning out the lamps upon which there were meters at a much earlier hour than the other lamps. It was agreed next year's meeting should be held at Dundee. Mr. D. Macfie, Edinburgh, read the last paper on "Regenerative Gas Lamps, with special reference to the lighting of large interiors." Mr. Macfie said that any ordinary regenerative gas lamp might be relied to increase the light from a given consumption of gas by 150 per cent.

THE MANCHESTER WATERWORKS.

THE Manchester Corporation, by invitation of the Waterworks Committee, have paid a visit of inspection to the waterworks in the Longdendale Valley. Five years have elapsed, says the *Manchester Guardian*, since the last occasion of the kind, and it was considered by the committee that, as many alterations and improvements have been completed since 1886, the younger members of the Council—those particularly who have been elected to represent the newly-incorporated districts—should be afforded an opportunity of seeing the important system of reservoirs and works which provide the city and district with water. Leaving the train at Woodhead station, an inspection was first made of the Etherow Weir and watercourses adjoining; also the watercourses at Heyden Brook and the Woodhead reservoir at Crowden. The spring watercourse at Crowden brook and the reservoirs of Torside, Rhodes Wood and Vale House were visited in turn, and the party had the great advantage of Mr. Hill's explanation of the system by which a supply of perfectly pure water is sent to Manchester for domestic consumption, whilst the turbid water coming from the hills in times of flood is collected in the two lower reservoirs

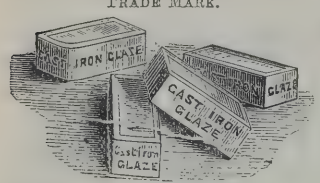
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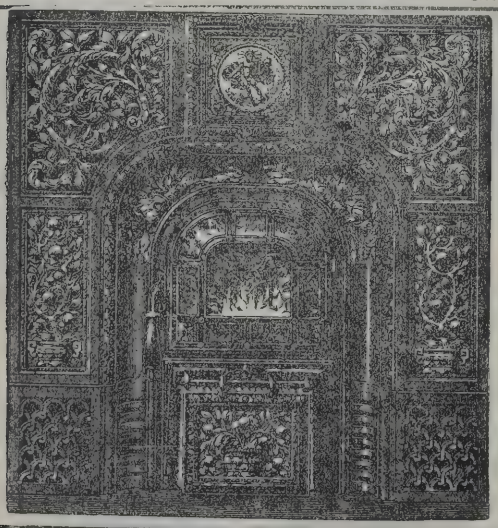
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ALL COLOURS.] Sole Agent:—ALFRED A. HOLM. [PRICES ON APPLICATION.

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(Bottoms and Vale House) and sent down the Etherow as "compensation" for the use of the millowners. The gauge basin through which this water passes is placed at the foot of the Bottoms reservoir embankment near Tintwistle Bridge, and at this point the water is delivered into the river. By means of the gauge basin the compensation water is measured, the Corporation being required to deliver 16 million gallons daily during working hours for six days in the week. It was pointed out that this system of reservoirs and works, the property of the citizens of Manchester, is now absolutely complete, no extension or material improvement being now practicable, and that it is the most perfect and elaborate system in existence in the kingdom. Its total cost to the Corporation since the acquisition of the old water company's property forty-five years ago has been 3,138,152*l.*, which sum includes 533,561*l.* of purchase-money paid for the old works; and the area of supply, about 84 square miles, comprises the city of Manchester and twenty-four adjoining townships, whilst the population at present served numbers about one million. The average consumption of water is about 14 gallons per head per day for each person for domestic purposes, and seven gallons per head per day for trading purposes, the total consumption being about 21 million gallons per day.

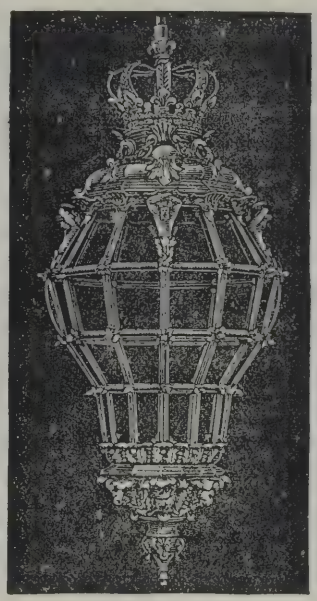
MESSRS. JOHN GIBBS & SON.

WE stated by mistake last week that the ventilators at the new Law Courts, Birmingham, were supplied by Mr. John Gibbs, of Liverpool. The ventilators were supplied by Messrs. John Gibbs, of Liverpool, and the ventilators so supplied were Messrs. John Gibbs & Son's "patent weatherproof extractors." The ventilators are stated to be a great success. Among the testimonials a well-known firm of architects write:—"We have much pleasure in stating that the eleven noiseless outlet ventilators you fixed at our senior partner's house, Parkbury, Oxton, have proved satisfactory. They have been subjected to severe tests during the past winter, and the vibration has been so slight as not to cause any inconvenience either in bed or sitting-rooms. We consider them a very great improvement on talc or mica flap ventilators."

Another firm write:—"We are pleased to inform you that the 'noiseless outlet ventilators' fitted up by you, both at our place of business and at the private house of our senior partner, are giving satisfaction, being effective as ventilators, and at the same time noiseless, as described by you."

ELECTRIC-LIGHT FITTINGS.

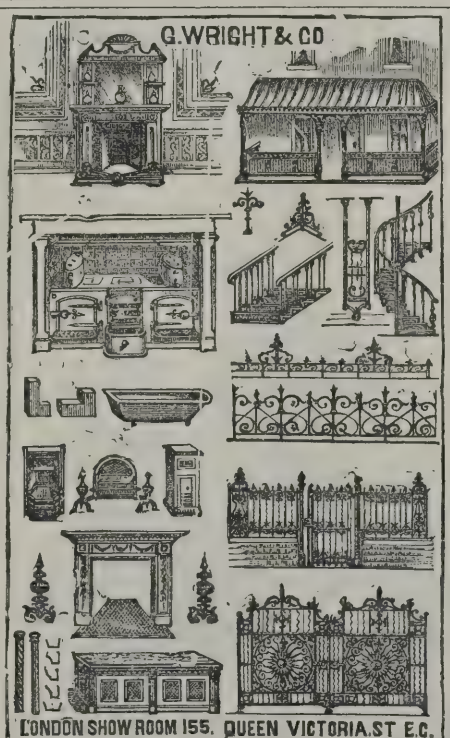
THOSE of our readers who are interested in electric-light fittings of artistic merit should pay a visit to the showrooms of Messrs. Perry & Co., of 17 Grafton Street, Bond Street, W. Aladdin's Palace itself could not have excelled the dazzling effect of the luxurious groups of candelabras, lamps, &c., which illumine by a touch of the magic switch. It is not merely in these charming fittings that the visitor would be interested—he would see



reproductions of the Renaissance period of Louis XIV., XV. and XVI., the result for the most part of Mr. Perry's personal travel amongst the leading Continental art centres. There are innumerable French and Italian examples from the Palace of Versailles, the Quirinal at Rome, St. Mark's Monastery, Florence, &c., every one of which furnishes a history that would delight the connoisseur. We illustrate some specimens, which will convey some idea of the design, the one below being a

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"THE GOLD MEDAL RANGE"
With Lifting Fire.
WORKS, ROTHERHAM. Estab. 1854.

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Versailles lantern. The next sketch is an illustration of a candelabrum. Messrs. Perry & Co. can certainly boast of a royal list of patrons, extending from King George IV. down to royalty of the present day, who have called in Messrs. Perry's services in decorative matters. It is interesting to inspect the original designs for this class of work, which are carefully stored and highly valued. We should not omit to mention four large bronze candelabra. They are reproductions of the Renaissance, acquired by the deceased antiquary Baslini for



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YOKOHAMA HARBOUR WORKS.

AN account of the works for the improvement of the harbour of Yokohama, which have been undertaken by the Japanese Government, is contained in the last British Consular report from that place. The chief features of the works are two breakwaters, one on the north, the other on the east side of the harbour, training works for the river which discharges itself into the bay on the north-west side of the harbour, and a pier for sea-going vessels. The two breakwaters have a total length of 12,082 feet, of which about 7,730 feet are on firm bottom and 4,352 feet on deep and more or less soft mud. Where the bottom is firm the breakwaters are to be concrete, with a rubble hearting and a foundation of concrete bag-work. The whole of the latter has already been laid. For the parts carried on mud the substructure, up to 10·5 feet below low water of spring tides, will be a mound composed of tuff-rock in large pieces, the interstices of which are to be filled by finer pieces of tuff, with an addition of coarse sand. This mound, much of which has already been built, is to have a breadth at the top of 35 feet, with slopes of 1 in 2, which are to be pitched when settlement is at an end. Lines of piling, at a few feet distance from the toes of the slope, are designed to prevent lateral flow of the mud. On this foundation of tuff will be built a superstructure 18 feet high, formed of horizontal courses of concrete blocks, with a hearting of hard-packed rubble. The whole length of breakwaters will terminate at 1 foot above high-water level of spring tides, their purpose being to serve as breakwaters only. The breakwater heads will leave between them an entrance 800 feet wide, having a depth of 30 feet at low-water springs. Of the whole water-space, about 2·1 square miles, bounded by the breakwaters, the training works and the land, fully a square mile is available, in its present condition, as anchorage for vessels drawing from 15 feet to 29 feet. It is proposed to deepen the shallower parts by dredging, and also to extend it shorewards by the same process. The dredging operations have lately been begun with a large bucket-ladder dredger imported from the Clyde. The works will be partly close-piling, partly pitched mounds of tuff, carried up to high-water level. The pier is to be an iron structure, on screw piles, carried out 1,980 feet from the landing-place, and having,

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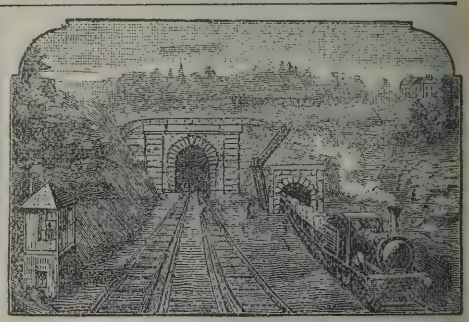
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THE LAW OF "COMMON EMPLOYMENT."

THE following is the conclusion of the report of the important case of Johnson (pauper) *v.* W. H. Lindsay & Co., which was heard in the House of Lords :—

Lord Watson, continuing, said :—The case was tried before Mr. Justice Grantham and a jury, who found for the plaintiff, and assessed damages at 52*l.* 10*s.* Their verdict was set aside, and judgment entered for the respondents by Mr. Baron Pollock and Mr. Justice Manisty, following what they conceived to be a principle established by the decision of the Court of Exchequer in Wiggett *v.* Fox (11 Ex. 832 and 25 L. J. Ex. 188). The learned Baron held it to be sufficient for the exoneration of the respondents that the appellants and their servants, though not necessarily fellow-servants, were fellow workmen in such a sense that the master of any one of them who negligently injured a fellow workman was not responsible for his negligent act; and he states the doctrine of Wiggett *v.* Fox to be that "if the person suing is the fellow labourer with the man whose immediate act occasions the injury, then there is no implied contract on the part of the master to recoup for any damage which he may suffer from that negligence." Mr. Justice Manisty was of opinion that the present case could not be distinguished from Wiggett *v.* Fox, and he added :—"If anything, in the present case the facts are stronger, in my view, to show that the persons employed upon this building were all under the control of the architect of the building owner." On appeal, Lords Justices Cotton and Lopes, Lord Justice Fry dissenting, affirmed the decision of the Divisional Court. Lord Justice Lopes, who delivered the judgment of the majority, states that, in their opinion, the respondents "became sub-contractors under Higgs & Hill, and were, together with the men directly employed by them, in the employment and under the general control of Higgs & Hill, working together for one common object, *i.e.* the carrying out of Higgs & Hill's contract, and taking upon themselves all the risks naturally incident to the work they had undertaken." That the learned judges meant to rest their decision upon that basis of fact is evidenced by their statement :—"We know of no case in which it has been held that a man is liable for an injury caused by his servant when the man doing the injury and the injured man are to be considered as employed in the work of another who is the common master of both." I do not think it necessary to discuss the question under what circumstances the servant of one man ought to be considered the servant of another. I can well conceive that the general servant of A might, by working towards a common end along with the servants of B, and submitting himself to the control and orders of B, become, *pro hâc vice*, B's servant, in such sense as not only to disable him from recovering from B for injuries sustained through the fault of B's proper servants, but to exclude the liability of A for injury occasioned by his fault to B's own workmen. In order to produce that result the circumstances must, in my opinion, be such as to show conclusively that the servant submitted himself to the control of another person than his proper master, and either expressly or impliedly consented to accept that other person as his master for the purposes of the common employment. To my mind there is not, in this case, a tittle of evidence to show that the respondents' workmen agreed to submit, or were in point of fact subjected, to the control either of Higgs & Co. or of Mr. Burden, the architect. I am, therefore, unable to assent to the assumption upon which the judgment of the Court of Appeal proceeds. I am also unable to assent to the legal doctrine which found favour with the Divisional Court and was pressed upon us in the argument for the respondents. I do not agree with Mr. Baron Pollock that the rule which exempts a master from liability to his servant for injuries negligently occasioned by a fellow-servant in the course of their common employment rests upon the absence of an implied contract by the master to recoup such damage. The master's responsibility for his servants' acts has its origin in the maxim, "Qui facit per alium facit per se," which has been construed as inferring his liability for what is negligently done by the servant acting within the scope of his employment. The immunity extended to a master in the case of injuries caused to each other by his servants whilst they are working for him to a common end is an exception from the general rule, and rests upon an implied undertaking by the servant to bear the risks arising from the

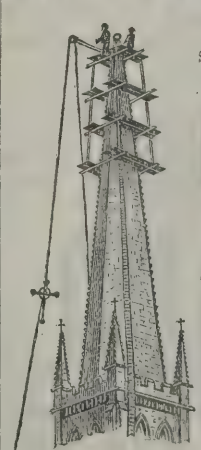
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possible negligence of a fellow-servant, who has been selected with due care by his master. I am of opinion, with Lord Justice Fry, that, in order to raise the exemption, there must not only be common employment, but a common master; and that the respondents are liable, because, in this case, although there was common employment, there was no common master. The principle of the master's immunity in such cases, frequently termed the doctrine of *collaborateur*, is of comparatively recent origin. In the law of England it can hardly be traced further back than Priestley *v.* Fowler, which was decided in 1837 (3 M. and W. 1). It was rejected by the Courts of Scotland until 1856, when, for the first time in either country, it was fully explained and reduced to its proper limits by Lord Cranworth in the Scotch case of Bartonshill Coal Company *v.* Reid (3 Macq. 266). The doctrine had previously been formulated by the Supreme Court of Massachusetts, in a judgment delivered by Shaw, C.J., in Farwell *v.* Boston and Worcester Corporation (4 Metcalf, 49), which was referred to with approval by Lord Cranworth. It is needless to quote passages from the opinions of Lord Cranworth and Shaw, C.J., which are now so familiar to professional lawyers. It is sufficient to say that, in my opinion, the rule, as laid down by these eminent judges, is strictly confined to the case of common employment under a common master, and that the reasons which they assign for the introduction of the rule have no application to any other case. Counsel for the respondents relied upon three decisions, two of them Scotch, as authorities for the extension of the doctrine to cases where there is no common master, but common employment for a common object. The first of these cases is Wiggett *v.* Fox (Ex. 832), as to which I can only say that, if it must be taken to establish the proposition maintained by the respondents, I could have no hesitation in holding that it was not decided according to law. But Baron Channell subsequently explained that he assented to the judgment because he thought Fox & Co. had control over Wiggett; by which he probably meant that the relation of servant and master did actually exist between Wiggett and Fox & Co. If that be taken as the true ground of the decision, it does not support the argument of the respondents, but comes within the rule enunciated by Lord Cranworth. The next case is Woodhead *v.* The Gartness Mineral Co. (4 Sess. Ca. 4th Series, 469), which was decided in 1877 by a majority of seven to one of the Inner House Judges of the Court of Session, the late Lord Justice Clerk (Lord Moncrieff) being the sole dissentient. It does not appear to me that the decision goes the full length of affirming that in cases of common employment, under different masters, each master is freed from responsibility for injuries inflicted upon the workmen of other masters by the negligence of his servants. The Lord President (Inglis), whose views are in substantial agreement with those of the six learned judges who came to the same conclusion with him, said:—"If two miners are employed and paid by the same master, and while they are hewing at the working face the one, by negligence, injures the other, the master is not answerable, because it is said they are engaged in a common employment—that is to say, they are engaged in the same work as servants of the same master. But if the legal principle were applicable to this case only it would cease to be a principle, and degenerate into a mere artificial and arbitrary rule. It is not because the wrongdoer is in a technical sense the servant of the same master that the master is not answerable. It is of no moment to the injured workman whether his injury be caused by a servant of the same master or by one who has undertaken some function in the same mine upon what is called an independent contract. The injury in either case is the same. The personal liability of the wrongdoer is the same. But the mine-owner is free from responsibility, not because the injured and the injurer are both his own hired and paid servants, but because he is not personally in fault, and has not warranted the injured workman against the perils of the work." In the third case relied on by the respondents, namely, Maguire *v.* Russell (12 Sess. Ca. 4th Series, 1,071), one tradesman had contracted to execute plumberwork and another to lay asphalte pavement in the same building; they proceeded to work under independent contracts, and in the course of their operations a workman engaged in asphalting was injured by a hammer which fell through a skylight in the roof through the negligence of one of the plumber's servants, and the injured man brought an action of damages against the plumber. It was not alleged in defence that the two men were working under the same master; but the second division of the Court assoilzied the defender, on the ground that the case was not distinguishable from Woodhead *v.* The Gartness Mineral Co. Notwithstanding the eminence of the judges constituting the majority of the Court in Woodhead *v.* The Gartness Mineral Co., I am constrained to differ from the law which they laid down. It appears to me to carry the immunity of masters far beyond the very precise limits assigned to it by the decisions of this House; and I have, therefore, no hesitation in affirming that it is not the law of Eng-

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land. I think it right to say that, in my opinion, certain observations made by the Lord Chancellor (Cairns) in the Scotch case of Wilson *v.* Merry & Cunninghame (1 Sc. and Divce. 326) were construed by some, if not all, of the majority in Woodhead *v.* The Gartness Mineral Co. in a sense which the noble and learned lord never intended them to bear. But, in order to appreciate the real purport and effect of these observations, it is necessary to advert to the previous course of judicial decisions in Scotland upon the question of a master's liability, and to the single point which the House had to determine in Wilson *v.* Merry & Cunninghame. Down to the date of the judgment of this House in the Bartonshill cases, the Court of Session declined to accept the doctrine of *collaborateur* as part of the law of Scotland, and held the liability of a master for his servants' fault to be the same in the case of a fellow-servant as of a stranger. After the doctrine was authoritatively declared to be Scotch law, the Court of Session construed the word *collaborateur* in its strictest sense, as signifying a fellow-servant who laboured with his hands. In pursuance of that technical interpretation, it was held in Somerville *v.* Gray (1 Sess. Ca. 3rd Series, 768) that a manager or foreman who merely superintended, and did no manual work, was not a *collaborateur* within the meaning of the rule, and consequently that the common master was responsible for injury to a fellow-servant arising from his negligence; whereas in Wright *v.* Roxburgh (2 Sess. Ca. 3rd Series, 748) it was decided that the manager of a colliery who with his own hands broke down part of a ventilating apparatus, and thereby caused an explosion of fire-damp which injured a workman in the service of his master, was acting as a *collaborateur*, and that the master was free of liability. Wilson *v.* Merry & Cunninghame was, in its circumstances, on all fours with Somerville *v.* Gray, and the Court of Session, therefore, came to the same conclusion that the master was not liable.

In moving the reversal of the judgment, the Lord Chancellor (Cairns), after citing the opinion of Lord Cranworth in Bartonshill Coal Company *v.* Reid, went on to say:—"I can only add to this statement of law that I do not think the liability or non-liability of the master to his workmen can depend upon the question whether the author of the accident is not, or is, in any technical sense the fellow-worker or *collaborateur* of the sufferer. In the majority of cases in which accidents have occurred the negligence has, no doubt, been the negligence of a fellow-workman; but the case of a fellow-workman appears to me to be an example of the rule, and not the rule itself" (1 Sc. and Divce. 331–32). That language appears to have been regarded by the Court of Session as justifying the inference that the rule ought not to be confined to fellow-servants of the same master—a construction which ignores the fact that the noble and learned lord was professedly speaking of the "liability or non-liability of the master to his workmen," and was dealing with no other subject. I do not doubt that the language of the noble and learned lord was simply intended to express his opinion that to hold a fellow-servant who directed, but did not labour in the common employment, was not a *collaborateur* was a strained and technical interpretation of the rule. I concur in the compendious definition of the principle upon which the master's non-liability rests which was given by my noble and learned friend Lord (then Mr. Justice) Blackburn, in Howell *v.* Landore Steel Company (L. R. 10, Q. B. 64), six years after the decision of this House in Wilson *v.* Merry & Cunninghame. His lordship said in that case:—"It is a rule of law that the master who employs a servant (not an agent) is responsible for the negligence of that servant in matters in which he is employed; but there is this exception, which has been established by a series of decisions, that with regard to a fellow-servant the master is not held so responsible, because this negligence is to be taken as one of the ordinary risks which the servant contemplates and undertakes when entering into his employment." For these reasons I concur in the judgment which has been proposed by my noble and learned friend on the woolsack.

Lord Morris concurred.

The judgment of the Court of Appeal was reversed and the judgment for the appellant was restored, the respondents to pay the costs in the Courts below and the costs incurred in the appeal to the House of Lords, the latter costs to be taxed in the manner usual where the appellant sues *in formâ pauperis*.

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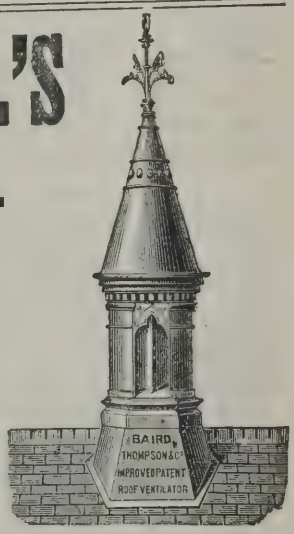
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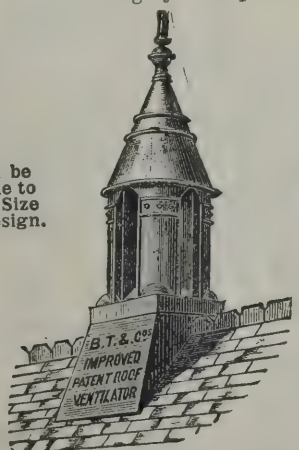

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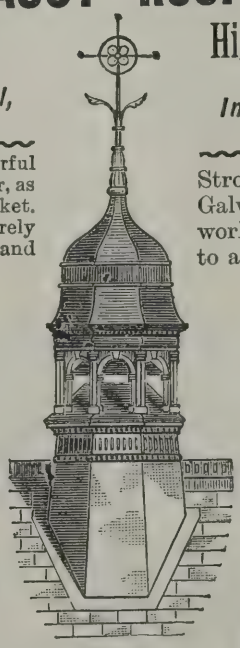
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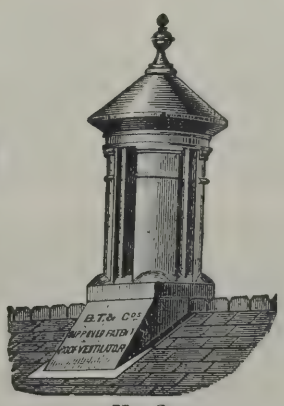

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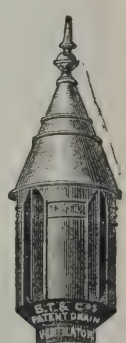
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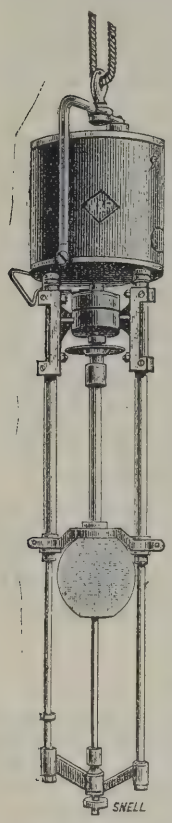


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stant skilled attention. It is a lamp which fulfils these conditions, and which we confidently recommend for general use, that we purpose noticing now. It is called the "Midget" from its small size, and is made to give 250 candle-power, using five ampères at an electromotive force of 45 volts, so that even with this small size of lamp we obtain one candle-power of light for the expenditure of every "watt" of electrical energy used. The illustration shows the general appearance of the lamp. The smallness of the globe prevents any depth of shadow, and minimises any complaint which may be urged against the inequality of the distribution of the light. The principle upon which the lamp works may almost be called simplicity itself. The upper parts of the rods forming the frame of the lamp are hollow, and in these the lower portions slide quite easily. The bottom carbon is attached to the lower part of the frame, which is fastened to the upper portions of the lamp by a chain passing up the hollow pillar forming the upper portion of the lamp, round a pulley-wheel, whose motion is controlled by clockwork, and then to the upper carbon holder, which acts as a counterpoise, and slides freely between the hollow pillars forming the frame of the lamp. The motion of the pulley is controlled by clockwork, which is started and stopped by a pivotted bar on whose under surface a number of teeth are situated. These engage a pointer attached to the pendulum of the clock. This bar is pivotted in the centre and attached at each end to iron plungers, which move inside the cores of electromagnets actuated respectively by the main and shunt circuits. When, owing to the distance between the carbon points, the resistance of the main circuit increases, and consequently the current through the shunt increases, the plunger is drawn further into the core round which the shunt circuit passes and the pendulum is released, the clockwork moves the carbons nearer together until the main circuit increases so much as to draw the other plunger into the core round which it passes, and so overpowers the effect of the shunt circuit. The bar is drawn down, the teeth engage the pendulum of the clockwork, and the carbons are maintained apart until, owing to the burning away, the same action is repeated. This action is so delicate that no inconvenience at all is caused by the intermittent feed; indeed it is scarcely noticed. When the current is stopped the pendulum is released owing to the action of a spring upon the bar, and the clockwork causes the carbons to remain together. In the small box over the upper carbon-holder the current before passing to the carbon magnetises an iron core, and lifts the upper carbon a small distance above the lower one, thus forming the arc when the current is first put on the lamp. The carbon is held up in this manner all the time the current is passing through the lamp. The lamp is wound in three different ways—one suitable for parallel working, one for series, and one for use with alternating currents. Those which are at present in use have given great satisfaction, and to meet the growing demand Messrs. Woodhouse & Rawson United, Limited, of 88 Queen Victoria Street, London, have stocked a large quantity of them, from which they will be able to supply orders.

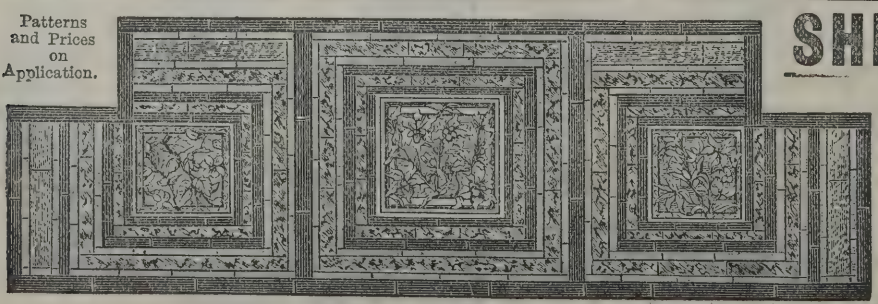


REGISTRATION OF PLUMBERS.

THE results of the May examinations of the students of the Glasgow and Greenock plumbers' classes in connection with the Glasgow and West of Scotland Technical College have just come to hand, and they are eminently satisfactory to the students and to the lecturer, Mr. David Fulton. The number of matriculated students in both classes last session was 130. About 80 of them took the technical examination, which lasted three hours, and of this number there have been 45 passes—11 in honours and 34 in the ordinary grade. Out of 20 of the students who went in for the practical examination—four hours' work—there have been 19 passes. In the honours grade there are two prizes for the United Kingdom. The first is 3*l.* in money, with a silver medal, and it has been gained by a student of the Greenock class, William M'Alpine. This student last year took the second prize in the ordinary grade. In the ordinary grade there are five prizes for the United Kingdom, and the third, 1*l.* in money, with a bronze medal, has been gained by a Glasgow student, Robert Young. Thus two of the seven prizes (and one of these the very highest) applicable to the United Kingdom have come to this district. These good results should stir the benevolence of the master plumbers to

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have the education of the young plumber even more complete, and they may be reminded that there is no practical plumbers' workshop in connection with the college.

The second annual congress of delegates from the several Scottish district councils for the national registration of plumbers was held at Glasgow on the 29th and 30th ult., under the chairmanship of ex-Bailie Crawford, chairman of the health committee of the city. About fifty delegates attended, including sanitary and other representatives and the Clerk and Master of the Worshipful Company of Plumbers. The Chairman, after welcoming the delegates to Glasgow, said that he could claim, as representing the authorities of Glasgow, that they were quite aware of the necessity for sanitary reform, and that this registration movement was very welcome indeed. Any encouragement that could be given to this movement on behalf of the authorities in Glasgow might be relied upon. In the name of this congress and the plumbers throughout Scotland he should take the opportunity of expressing their warm appreciation and hearty admiration of the efforts being made by the Worshipful Company of Plumbers in the direction of sanitary reform. The secretaries of the various councils reported as to the present state of technical and practical education for young plumbers in their respective districts. These reports, on the whole, were satisfactory. A proposed graded scheme of education applicable to the whole of the districts was described by the clerk to the Plumbers' Company, and Mr. Fulton, lecturer to the Glasgow and Greenock plumbers' classes, having by invitation given his opinion, it was unanimously resolved, after considerable discussion, "That this congress, having carefully considered the graded syllabus of education and examination prepared by the Worshipful Company of Plumbers, recognises that it is fitted to greatly advance the members of the craft, and earnestly recommends the various councils to endeavour to have the provisions of the scheme adopted in the various technical institutes throughout the country." The subject of the promotion of new classes in the larger centres in direct connection with each council was remitted to the councils, as was also the question as to the ways and means for best promoting workshop instruction in connection with the technical classes. The apprenticeship question was before the congress in connection with a proposed model indenture, and it was resolved that this matter should also be remitted to the councils for their opinion. With regard to technical libraries, the congress was of opinion that such libraries would be beneficial, and that they should be instituted. Matters in connection with the section of the International Congress of Hygiene in London dealing with the education and registration of plumbers and the draft of the proposed parliamentary Bill for conferring corporate powers in connection with the national registration of plumbers were also considered.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

Applications for Patents.

12274. Alfred Atkinson and Edwin Verity, for "An improved means of securing the covers of gulley grates to their frames."

12329. George William Wood, for "An improved means or apparatus for operating the ventilating ridges of greenhouses and the like."

12370. Henry James Shinkfield, for "Improvements in rim and other locks."

12382. John McIvor Adolphus, for "Improvements in draught regulators."

12414. Jeremiah Morgan, for "Device for holding window blinds and the like at any point, and for regulating fall of same."

12418. James Edge, for "Improvements in safety valves for kitchen and hot-water boilers."

12564. David Hamilton, for "A pocket sketching easel."

12582. Lawrence Eadson Mannings, for "An improved self-locking sash fastener."

12664. Castle Smith, for "Improvements in white decorative stucco or parqueting."

12674. William Wilson Horn, for "Improvements in padlocks."

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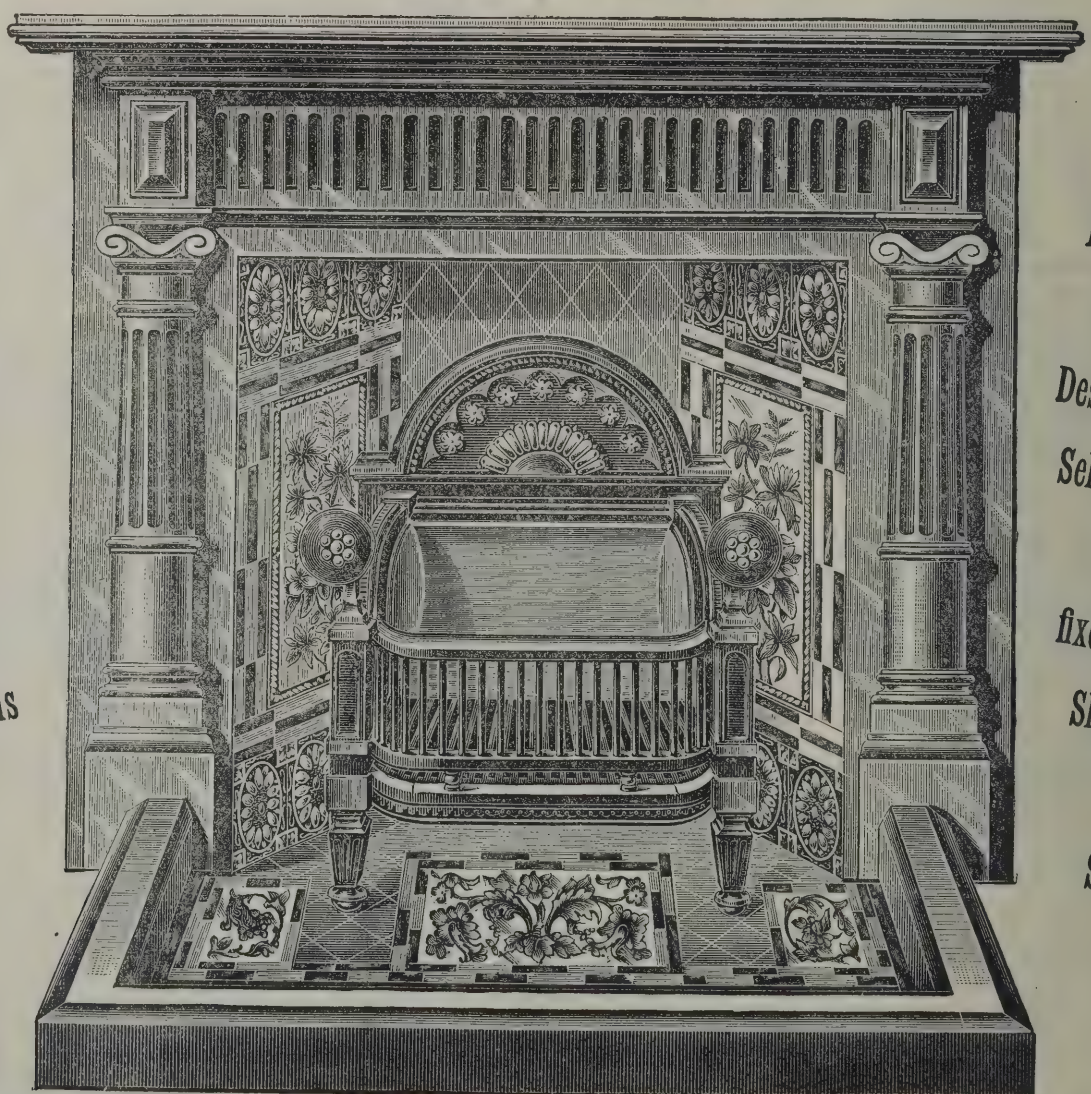


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Friday, August 7, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, AUGUST 14, 1891.

TENDERS, ETC.

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CONTRACTS OPEN.

BATLEY.—Aug. 19.—For Building Girls' Higher Grade School. Mr. H. B. Buckley, Architect, 8 East Parade, Leeds.

BIRMINGHAM.—Aug. 17.—For Alterations at County Court Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

BLACKHILL.—Aug. 15.—For Building Methodist Sunday School, Classrooms, &c. Mr. J. Shields, Architect, 42 Fawcett Street, Sunderland.

BRECON.—For Building Board Schools. Mr. E. H. Lingen Barker, Architect, 146 St. Owen's Street, Brecon.

BRIGHOUSE.—Aug. 15.—For Building Twenty-one Houses. Mr. J. F. Walsh, Architect, Halifax.

BUCKINGHAM.—Aug. 18.—For Building County Police Station and Lock-up House. Mr. R. J. Thomas, County Surveyor, 67 New Road, Aylesbury.

CAERPHILLY.—Aug. 24.—For Building Ten Cottages. Messrs. Phillips & Holdgate, St. John's Chambers, Cardiff.

CARDIFF.—Aug. 20.—For Chancel, Organ Chamber, Vestries and South Aisles to St. Catherine's Church. Messrs. Kempson & Fowler, Architects, Llandaff.

CARMARTHEN.—Aug. 14.—For Additions, &c., to Wesleyan Chapel. Mr. W. J. Needle, 22 Union Street, Carmarthen.

CLIST HONITON.—Aug. 20.—For Repairing Dymond's Brook Bridge. Mr. E. H. Harbottle, County Surveyor, County Chambers, Exeter.

CLYNDERWEN.—Aug. 15.—For Building Parsonage. Mr. Ernest Collier, Architect, 4 Quay Street, Carmarthen.

COVENTRY.—Aug. 21.—For Building Villa. Mr. Herbert W. Chattaway, Architect, Trinity Churchyard, Coventry.

DARTFORD.—Aug. 15.—For Boiler-house, Chimney Shaft, &c., Gore Farm Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

DENBIGH.—Aug. 31.—For Building Chancel and Alterations to St. David's Church. Mr. R. Lloyd Williams, Architect, Park Lane, Denbigh.

DORCHESTER.—Aug. 24.—For Tar Paving. Mr. G. Symonds, Town Clerk's Office, Dorchester.

DORKING.—Aug. 27.—For Constructing Sewers. Mr. W. Rapley, jun., Wather Road, Dorking.

GALLOWAY.—Aug. 28.—For Building Houses. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

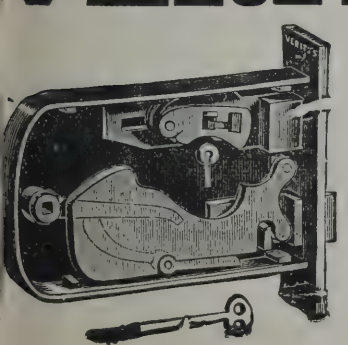
HALIFAX.—Aug. 15.—For Building Four Houses and Works at Moorfield Lodge. Mr. T. L. Patchett, Architect, George Street Chambers, Halifax.

HANWELL.—Aug. 24.—For Laying Sewer, Fixing Ventilators, &c. Mr. E. J. W. Herbert, Local Board Offices, High Street, Hanwell, W.

HAYWARD'S HEATH.—Aug. 28.—For Additions to Ward at County Lunatic Asylum. Mr. Henry Card County Surveyor, Lewes.

KING'S HEATH.—Aug. 14.—For Building Petty Sessional Court, with Cells, Residences and Other Buildings. Mr. H. Rowe, County Surveyor, Worcester Chambers, Pierpoint Street, Worcester.

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Lewisham.—Aug. 17.—For Constructing Road and Sewer. Mr. H. A. Alexander, 72 Cannon Street, E.C.

Malpas.—Aug. 26.—For Laying on Water Supply. Mr. John Anstie, 17 Victoria Street, Westminster.

Morley.—Aug. 26.—For Building Town Hall, Municipal Offices, Police Courts and Offices. Messrs. Holtom & Fox, Architects, Dewsbury.

Netley.—Aug. 14.—For Painting. Lieutenant-Col. E. M. Larminie, Royal Engineer Office, Gosport.

Newport.—Aug. 17.—For Building Church at Barnard Town. Messrs. W. Graham, Son & Hitchcox, Architects, Victoria Chambers, Newport, Mon.

Newport.—Aug. 17.—For Construction of Brick and Pipe Sewers. Mr. F. W. B. Waterworth, Town Hall, Newport, Isle of Wight.

New Wortley.—Aug. 18.—For Construction of Urinals, Water-closets, &c., at Gasworks. The Resident Engineer, Gasworks, Leeds.

Shotley Bridge.—Aug. 15.—For Constructing Evaporating Furnaces. Messrs. John Annandale & Sons, Shotley Bridge.

Sutton.—Sept. 7.—For Constructing Sewers. Mr. John Anstie, 17 Victoria Street, S.W.

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William Robson, Gosforth, Newcastle-on-Tyne (*accepted*).	

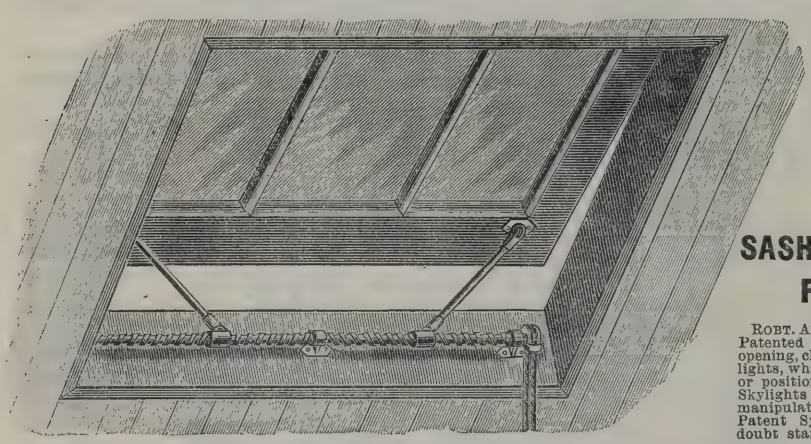
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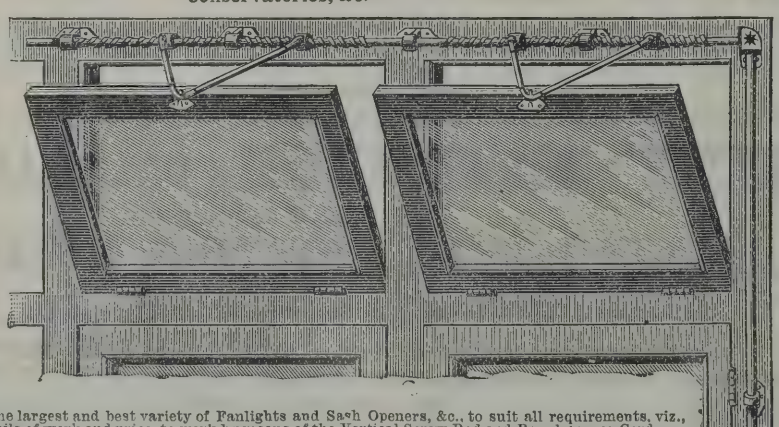


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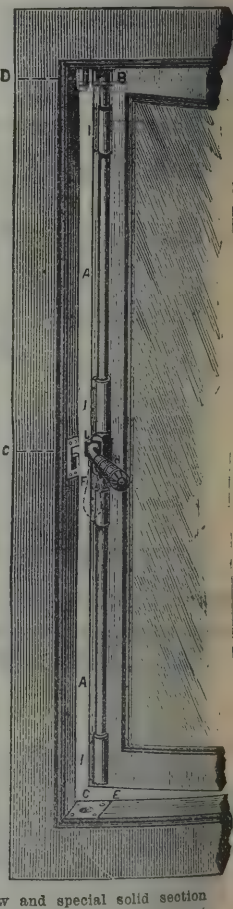
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G. Lawson, Glasgow (*accepted*)	9,000 0 0

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Lansdowne & Son, Lincoln	3,250 0 0
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A. Colvill, Edinburgh	£28.090 0 0
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Morrison & Mason, Glasgow	25,190 8 2
T. V. B. Wilson, Glasgow	24,716 7 6
T. Adam & Co., Glasgow	24,350 0 0
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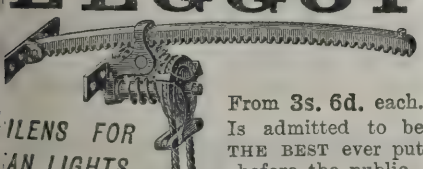
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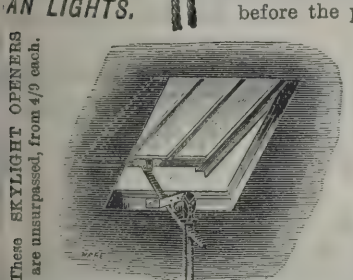
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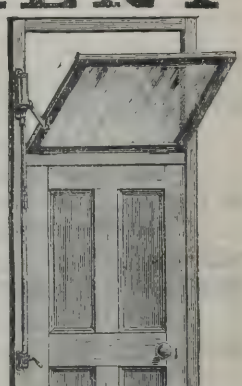
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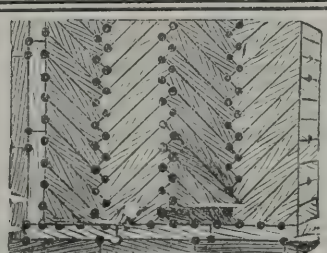
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Knight, Cuckfield	307 0 0
J. KENT, Hayward's Heath (*accepted*)	248 10 0

HEREFORD.

For Erection of Villa at Lower Bullingham. Mr. W. W. ROBINSON, Architect, King Street, Hereford.

H. Welsh, Hereford	£665 0 0
R. Taylor, Hereford	650 0 0
J. Davies, Hereford	525 0 0
J. Hiles, Hereford	518 0 0
E. NORRIS, Little Dewchurch (*accepted*)	447 10 0

For Erection of Two Pairs of Cottages, for the County and City Asylum. Mr. W. W. ROBINSON, Architect, King Street, Hereford. Quantities supplied by Architect.

W. Bowers & Co., Hereford	£1,283 0 0
Beavan & Hodges, Hereford	1,159 0 0
H. Welsh, Hereford	1,100 0 0
J.S, Hereford DAVIE (*accepted*)	1,013 14 0

LEYTONSTONE.

For Alterations and Additions at the Cowley Arms, High Road, Leytonstone, for Mr. J. Willson. Mr. FRED. A. ASHTON, Architect, Stratford, E.

Baskett & Atkins	£1,801 0 0
North Bros.	1,794 0 0
W. Watson	1,660 0 0
Hearle & Farrow	1,551 0 0
J. & H. Cocks	1,368 0 0
Coulsell Bros.	1,333 0 0
F. VOLLER (*accepted*)	1,247 0 0

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For Rebuilding No. 84 Wimpole Street, W., for Mr. Samuel Lithgow. Mr. C. H. WORLEY, Architect. Quantities by Mr. R. C. Gleed.

Lawrance & Sons	£3,225 0 0
Bywaters	3,179 0 0

For Alterations and Additions to No. 25 Welbeck Street, for Mr. Samuel Lithgow. Mr. C. H. WORLEY, Architect. Quantities by Mr. R. C. Gleed.

E. WHITE (*accepted*)	£1,700 0 0

LONDON—*continued.*

For Laying-out Grounds, Drainage, and Building Chapels, Lodge, &c., for Cemetery at Willesden, for the Willesden Burial Board. Mr. C. H. WORLEY, Architect. Quantities by Mr. R. C. Gleed.

R. BALLARD (*accepted*)	£6,024 0 0

For Alterations and Additions, No. 21 Harley Street, for Mr. G. Anderson Critchett. Mr. T. PHILLIPS FIGGIS, Architect. Quantities by Mr. R. C. Gleed.

Simpson & Son	£2,566 0 0

For Rebuilding No. 4 Union Court, Old Broad Street. Mr. HERBERT KNIGHT, Architect, 129 Cheapside.

H. HAWKINS (*accepted*).

For Alterations to No. 80 Wood Street, for "Ye Mecca." Mr. HERBERT KNIGHT, Architect, 129 Cheapside.

G. NEWTON (*accepted*)	£317 3 0

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KIRBY & CHASE (*accepted*)	£173 0 0

For Additions to Home of Industry, London Fields. Mr. GEORGE BAINES, Architect, 4 Great Winchester Street, E.C.

F. & H. F. Higgs	£1,596 0 0
H. L. Holloway	1,550 0 0
W. Shurmur	1,458 0 0
R. G. Battley	1,419 0 0
Mark Gentry	1,397 0 0
S. J. Scott	1,380 0 0
F. J. COXHEAD, Leytonstone (*accepted*)	1,189 0 0

For Painting, &c., at Poland Street Workhouse, for the Guardians of Westminster Union. Mr. JOHN WALDRAM, C.E., Surveyor, 13 Buckingham Street, W.C. Quantities by Mr. Percy J. Waldram.

Patman & Fotheringham	£795 0 0
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Shillitoe & Son	£1,342 0 0
T. Stevens	1,241 0 0
H. M. Moody	1,097 0 0
F. GLADWELL (*accepted*)	1,075 0 0

For Alterations and Additions to St. Mark's Schools, Notting Hill, W. Mr. C. L. R. TUDOR, Architect, 81 Lancaster Road, Notting Hill, W. Quantities by Mr. Charles J. Ford, 3 Clifford's Inn, E.C.

H. Lindfield	£460 0 0
F. Holdstock	426 0 0
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W. Nash	387 10 0
H. & E. LEA (*accepted*)	—

For Alterations and Additions to Normand House, Fulham, S.W. Mr. C. L. R. TUDOR, Architect, 81 Lancaster Road, Notting Hill, W. Quantities by Mr. Charles J. Ford, 3 Clifford's Inn, E.C.

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Holloway Bros.	1,169 0 0
W. Nash	1,140 0 0
H. H. Hollingsworth	1,123 0 0
H. & E. Lea	1,123 0 0
H. M. MOODY, Folkestone (*accepted*)	1,045 0 0

For Reconstruction of Sewer, Sidney Street, Mile End Old Town. Mr. J. M. KNIGHT, Surveyor.

J. R. Hunt, St. Paul's Road	£2,200 0 0
J. Jackson, Forest Gate	1,941 9 6
T. W. HAWKINGS, Mile End (*accepted*)	1,767 0 0

For Alterations at Workhouse, for the Fulham Board of Guardians.

LESLIE & Co., Kensington (*accepted*)	£23,980 0 0

For Alterations, &c., to 54 Walton Street, Lennox Gardens. Messrs. POOLEY & FOLLETT, Architects, 21 John Street, Adelphi.

Jones, Richards & Co., Belgrave Square	£697 0 0
J. Sorrell & Co., Chelsea	645 0 0
Simmonds Bros., Fulham Road	638 0 0
W. H. Watts, Walton Street	580 0 0
R. & H. Byron, Fulham Road (*withdrawn*)	480 0 0

LONDON—*continued.*

For Rebuilding Stables and Granary, &c., in Harley Mews North, for Messrs. H. & D. J. Oyler. Mr. C. H. WORLEY, Architect. Quantities by Mr. R. C. Gleed.

Bywaters	£2,297 0 0
Simpson & Son	2,155 0 0
Lawrance & Sons	2,154 0 0

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For the Blackwell and South Normanton Waterworks. Mr. GEO. HODSON, M.Inst.C.E., Westminster and Loughborough.

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Jenkins & Sons, Leamington	4,094 8 5
S. Burnham, Alfreton	3,996 7 0
F. J. Collingwood, Rhyl	3,950 0 0
J. Bentley, Leicester	3,880 0 0
J. Beattie, South Kensington	3,840 0 0
Oliver & Co., Chesterfield	3,770 10 0
Fotherby & Sons, Burnley	3,764 12 4
J. Lane, Skegby	3,750 0 0
Price & Sharelow, Nottingham	3,735 0 0
CHARLES GREEN, Wellgate, Rotherham (*accepted*)	3,517 0 0

PLYMOUTH.

For Building Mission Chapel, Amity Place, Plymouth, for Parish of St. Matthias. Quantities by Mr. JAS. HARVEY, M.S.A., Architect, Bedford Chambers, Bedford Street, Plymouth.

F. C. Ambrose	£1,160 0 0
A. Ambrose	1,120 0 0
Tozer & Son	1,019 7 0
H. Kerswell	988 9 0
T. May	953 0 0
Pellow Bros.	950 0 0
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For Building Two Dwelling-houses on the Embankment Road for the South Beach Estate, Pwllheli. Mr. OWEN MORRIS ROBERTS, Architect, Portmadoc.

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JOHN JONES, S. ROBERTS, WILLIAM & RICHARD JONES, Pwllheli (*accepted*)	2,877	0	0

For Building Three Dwelling-houses on the Victoria Parade, for the South Beach, Pwllheli, Land and Building Corporation Cc., Limited. Mr. OWEN MORRIS ROBERTS, Architect, Portmadoc.

Isaac Watkins, Criccieth	£2,860	0	0
William Owen & R. Jones, Pwllheli	2,712	0	0
JOHN JONES, S. ROBERTS, WILLIAM & RICHARD JONES, Pwllheli (*accepted*)	2,709	0	0

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For Widening Etchington Bridge and Two Bridges at Robertsbridge, for the East Sussex County Council. Mr. H. CARD, County Surveyor, Lewes.

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H. J. Daniells, Hurst Green	284	2	0
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Measures Bros., London	144	15	6
M. Shaw & Co., London	138	10	0
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J. LYSAGHT, London (*accepted*)	109	0	0

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For Erection of Shop and Premises, Pegwell Bay, Ramsgate. Messrs. ALFRED R. PITE & SON, Architects, 5 Bloomsbury Square, W.C.

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White Brothers	274	0	0
Martin	256	0	0
Home	249	0	0
Bowman	249	0	0
Forwalk	242	0	0

RAMSGATE—*continued.*

For Erection of Three Houses, Ramsgate. Messrs. ALFRED R. PITE & SON, Architects, 5 Bloomsbury Square, W.C.

Grummant	£964	0	0
White Brothers	940	0	0
Forwalk	899	0	0
Martin	897	0	0
Home	875	0	0
Bowman	823	0	0

SOUTHAMPTON.

For Completing Twelve Cottages on the Old Northam Church Site, Southampton. Mr. W. BURROUGH HILL, Surveyor, Above Bar, Southampton.

R. G. Evans, Southampton	£1,200	0	0
W. C. Mears, Southampton	859	19	0
Rowland & Son, Southampton	845	0	0
E. SANDON, Southampton (*accepted*)	775	0	0

STAFFORD.

For Building Coal Stores at the Stafford Gasworks. Mr. JNO. FERGUSON BELL, C.E., Engineer. Quantities by the Engineer.

W. Reynolds, Stafford	£636	0	0
J. Jervis, Stafford	559	0	0
Adams & Pemberton, Stafford	556	0	0
F. ESPLEY, Stafford (*accepted*)	492	11	8
Engineer's estimate	550	0	0

Ironwork for Coal Stores Roof.

Dixon & Co., Liverpool	448	0	0
F. Holmes, Stafford	417	16	0
W. Breltall, Worcester	414	0	0
Rudge & Griffiths, Stafford	397	10	0
Rammage, Gordon & Co., London	390	0	0
Bruce & Still, Liverpool	378	0	0
F. Morton & Co., Liverpool	363	0	0
W. Glover & Son, Warwick	360	0	0
Renshaw & Co., Stoke	335	0	0
Whessoe Foundry Co., Darlington	328	0	0
J. Tillesley, Willenhall	315	0	0
E. C. & J. Keay, Birmingham	306	3	0
Bagshaw & Son, Batley	305	0	0
Eastwood, Swingler & Co., Derby	293	3	6
J. Lysaght & Co., Ltd., London	280	0	0
RICBERY & Co., Darlaston (*accepted*)	280	0	0
Engineer's estimate	300	0	0

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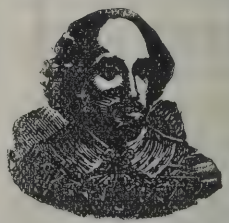
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Noiseless Outlet Ventilator.



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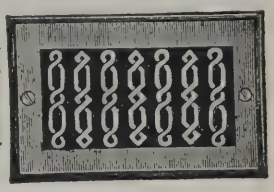
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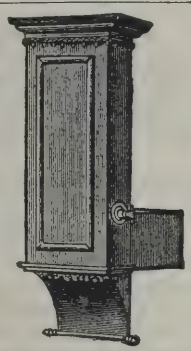


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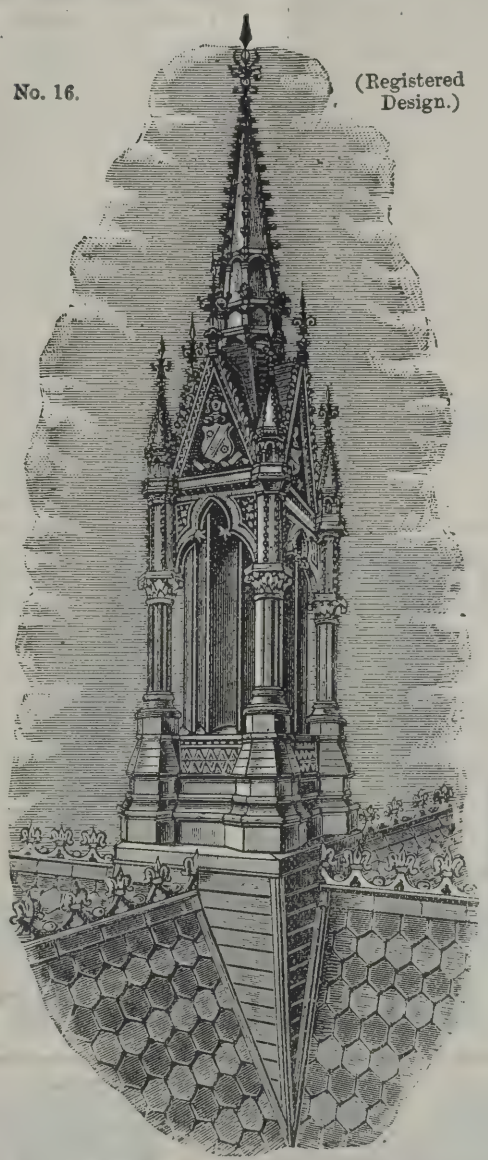
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No. 7 (Inlet). Ornamental Bracket Pattern.



No. 3 (Registered Design). Gibbs' Patent Weatherproof Extractor.

No. 16. (Registered Design.)



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„	14	„	5 to 7 „ ..	1	17	6	„	24	„	9 to 12 „ ..	5	5	0	„	42	„	16 to 20 „ ..	11	17	6
„	16	„	6 to 8 „ ..	2	12	6	„	27	„	12 to 14 „ ..	6	7	6	„	48	„	18 to 24 „ ..	16	15	0
„	18	„	7 to 9 „ ..	3	5	0	„	30	„	13 to 15 „ ..	7	10	0	„	54	„	20 to 27 „ ..	19	0	0

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J. Harley & Son, Smethwick	365 0 0
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For Erection of School Buildings, Administrative Block, Dining Hall, Wards, Board-room, Boiler-house, &c., Worcester Union Workhouse. Messrs. HENRY ROWE & SONS, Architects, Worcester Chambers, Pierpoint Street, Worcester. Mr. George Kenwrick, Surveyor, Colmore Row, Birmingham.

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Kellett, Willesden	£25,849 0 0
Kendrick, Worcester	24,186 0 0
Thompson, Kidderminster	24,148 0 0
Willcock, Wolverhampton	24,022 4 6
Jones & Co., Gloucester	23,890 0 0
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For Erection of a Recreation Hall at Leavesden Asylum, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

J. Payne	£6,637 0 0
Leslie & Co.	6,600 0 0
J. & R. Waterman	5,974 0 0
T. Turner	5,897 0 0
W. Johnson & Co., Limited	5,866 0 0
C. MISKIN, St. Albans (*accepted*)	5,844 0 0

BUILDING AND BUILDERS.

THE half-yearly meeting of the National Association of Master Builders of Great Britain has been held at Cambridge, under the presidency of Mr. J. C. White, of Liverpool. Representatives were present from London, Liverpool, Manchester, Birmingham, Bradford, Cambridge, Bolton, Leicester, the Potteries and Preston. The report and accounts for the past half-year were passed and adopted. The questions submitted by the Labour Commission were discussed and also the question of a form of contract, which is under consideration by the Royal Institute of British Architects. It was also referred to the Council to consider the advisability of establishing in the building trades some system of national federation of employers and employed, somewhat on the lines of similar recent associations, and also dealing with the pensioning of old and disabled workmen.

THE work of remodelling and renovating Forthampton Court, near Tewkesbury, for Mr. Reginald Yorke, which Mr. Albert Estcourt, contractor, of Gloucester, has had in hand for the past eighteen months, has now been completed, and the chief architectural features of the old mansion have been well preserved.

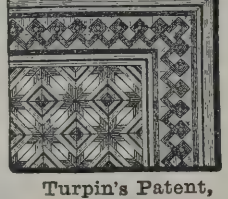
THE Cardiff County Council have under consideration a scheme for borrowing 34,000*l.*, for the purpose of acquiring new building and lands for technical instruction purposes in the district.

THE *Aberdeen Free Press* says that at the Town Council meeting it was stated in the course of the discussion on the Union Terrace improvement that a public body in Aberdeen

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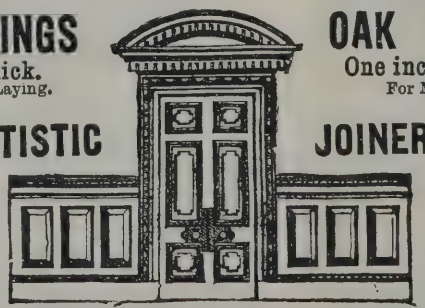
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were negotiating for ground in Union Terrace on which to erect new buildings. It is understood that the body referred to is the School Buildings Committee of the School Board, who have been looking at a site in Union Terrace on which to build new offices for the Board.

THE Grand Theatre and Opera House at Stockton has been entirely remodelled by Mr. Frank Matcham, architect, whose plans have been carried out under the direction of Mr. C. Moses, of North Ormesby.

THE Governors of the Pontefract Grammar School have unanimously resolved to erect and furnish a chemical laboratory in connection with the school at a cost of about 300*l.*

VARIETIES.

THE Lincoln Town Council, as urban authority, propose obtaining compulsory powers to acquire the properties between High Street and Hungate required for the completion of West Parade.

IT is proposed to construct a bridge over the river Wear at Chester-le-Street, in order to open out more direct and convenient communication between the important communities living on each side of the river.

IN recording the death of Mr. Isaac Booth, architect and surveyor, at Halifax, in his sixty-eighth year, the *Halifax Courier* says:—Mr. Booth was a native of Keighley, and was articled with the late Mr. Dennis Chantrell, of Leeds, and while serving under his articles he acted as one of the clerks of works of the Leeds parish church. On completing his term with Mr. Chantrell he was engaged for some time in the ordnance survey of Yorkshire. Afterwards he commenced business on his own account in Keighley, and superintended the erection of the parish church there. About forty years ago he came to Halifax, entering into partnership with Mr. Richard Carter, their offices being in Horton Street, where Messrs. Bracken's warehouse now is. A few years later Mr. Carter left Halifax, and since that time up to his death Mr. Booth carried on business on his own account in the offices in George Street. Latterly he was much more engaged in surveying and engineering works than in architecture, and there were few arbitrations in the district affecting real property where he was not in some way concerned, either as umpire, arbitrator or witness. The last public scheme of importance in which he has been concerned is that for constructing a railway through Booth Dean to Lancashire. He had made a survey of the route, and was consulting engineer to the promoters.

AN inquiry has been held at Skipton into the application of the Skipton Local Board to borrow 2,300*l.* for public improvements in the town. The inspector expressed himself satisfied with the proposed improvements.

THE Birkdale Local Board propose to obtain powers to borrow 15,900*l.* for drainage purposes and about 3,000*l.* for street improvement works.

THE 1,008th anniversary of the parish church, Chester-le-Street, has just been celebrated. The history of the church dates from 883, when the monks of Lindisfarne brought the body of the sainted Cuthbert to Chester-le-Street.

LIGHTNING conductors have been fixed to the four pinnacles of Gloucester Cathedral tower. No mishap happened, although the men have been exposed to extra risk when at work on the tower during the heavy thunderstorms which have recently occurred. The fixing of conductors to the dozen other pinnacles of the cathedral, which have an altitude considerably less than those of the tower, will next be taken in hand.

AT the meeting of the Stratton Rural Sanitary Authority it was decided to commission Mr. Anson to prepare plans and specifications for water supply works for Stratton and Bude.

A COMMITTEE meeting of the Works Committee of the River Dee Board of Conservators, together with representatives of the Cheshire and Flintshire County Councils, has been held at Chester to consider the proposal for erecting a new bridge over the Dee at Queen's Ferry to take the place of the ferry-boat service. The committe of Conservators are to prepare a scheme for submission to the two County Councils.

A RESOLUTION proposing the building of new police stations, &c., at Millom and Cockermouth, and the acquirement of the sites, has been agreed to by the Carlisle County Council.

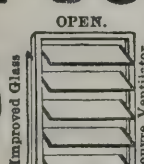
THE *Liverpool Courier* says:—No award has yet been made by the arbitrator in the Monk and Newell litigation, but the Water Committee yesterday (the 11th inst.) had their eyes opened with regard to the enormous costs that were incurred in connection with the arbitration, more especially for fees. The

H. W. COOPER & COMPANY, LIMITED.

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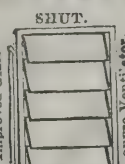
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Manufacturers of Cooper's Glass, Revolving, Circular, and Sliding Ventilators (H. W. Cooper, Sole Inventor).

Improved Glass Louvre and Venetian Ventilators, for Private and Public Buildings, Churches, Halls, and lights of every description. Improved Iron, Copper, Brass, and Gun-Metal Casements. New Hopper Ventilators for Skylights, &c. Medal awarded to H. W. Cooper from Glass Sellers' Company Exhibition, London, 1876. Diploma of Merit, Sanitary Institute of Great Britain Exhibition, Glasgow, 1883. Diploma of Merit, National Health Society Exhibition, London, 1883.

H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.





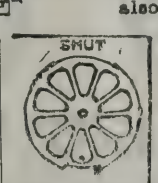
MEDAL AWARDED, 1876.

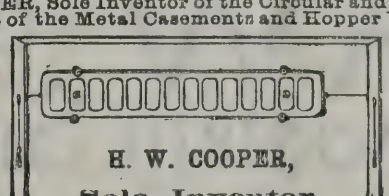


Improved Casement.

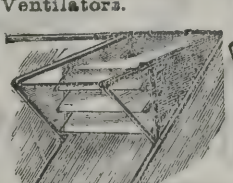


Circular Glass Revolving Ventilator.

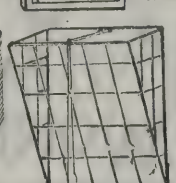




Glass Sliding Ventilator.



Improved Hopper for Skylights.



Hopper Ventilator.



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"little bill" was simply mentioned, and when some of the members became aware of the large amount due from the Corporation on this account they did not hesitate to express their astonishment and indignation. What the actual amount is has not transpired, but the ratepayers will ere long know precisely how the matter stands, for at the next meeting of the committee it will in all probability be fully discussed.

The popular prices at the Olympic Theatre, now known as "the people's theatre of London," have hit the public taste, and crowded houses nightly have proved the wisdom of Mr. W. W. Kelly's bid for the favour of the masses. In consequence of the great success of its revival at a West-End theatre, "Theodora" will be played until the end of the present month, and on and after Saturday next will be preceded by a new farce written by Mr. Murray Carson, entitled "Two in the Bush."

It has been decided to borrow 15,700*l.* for the purposes of reconstruction of sewers in Paisley.

Improvements are to be carried out at Leicester Town Hall at an estimated cost of about 1,700*l.*, which includes reseating the council chamber.

A scheme for the sewage disposal is under consideration for Blackburn, the cost of which, it is thought, will amount to nearly 100,000*l.*

The Executive Committee of the Association for the Promotion of Art and Music in Glasgow have resolved that there should be a double competition with the view of obtaining a suitable design for the new galleries. From among the competitors at least five will be selected, and they will be invited to send in complete plans and drawings, one of which would be selected. Mr. Alfred Waterhouse, R.A., was appointed assessor to guide the committee in the various steps they have to take in framing instructions for the competition, and in finally selecting a plan. It was also remitted to Mr. Waterhouse, along with Mr. Macdonald, city engineer, and Mr. Paton, curator of the Corporation Galleries, to adjust, on the basis of the report approved, the conditions of the competition and the instructions to the architects. These will be printed and submitted to a meeting of the executive to be held on Monday, August 24, so that advertisements can appear in the architectural and other technical journals on August 29 inviting competitive plans, which it will be arranged should be sent in early in November. It is expected that building operations will be commenced in April next, and that the foundation-stone will be laid in August next.

TRADE NOTES.

The new schools, Ince, near Wigan, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

The difficulty of securing gas-light in out-of-the-way country houses, factories, &c., is met by the "Helios" gas-making machine, at a cost of less than 1*s.* per 1,000 cubic feet. The "Helios" is simple, automatic, and the element of danger is entirely absent. The Incandescent Gaslight Company, Limited, 14 Palmer Street, Westminster, S.W., are the proprietors of this invention. We hope to give illustrations of the "Helios" in our next issue, and enter more in detail as to its merits.

On Bank Holiday last an interesting event took place at the parish church, Epworth, viz. the starting of a new public clock, striking the Cambridge chimes on four bells and the hours on a fine tenor bell of about 27 cwt. The old clock, which was quite worn out and useless as a timekeeper, was erected just a century ago to commemorate the event of some of the family being preserved from a fire at the rectory. The present clock was erected by public subscription, Mr. Thos. Johnson acting as secretary to a strong committee. Messrs. Wm. Potts & Sons, clock manufacturers, of Guildford Street and Cookridge Street, Leeds, makers of the cathedral clock, Lincoln, were selected to carry out the necessary work, which they have done to the satisfaction of all concerned.

On the 31st ult. a new clock was dedicated in the parish church, Arksey, presented by the Misses Dunhill in memory of their father. The hours are struck on the tenor bell, which bears the date 1622, and the quarter chimes on two smaller bells placed in the tower fifty years after that date. The design is that of Lord Grimthorpe, with the gravity escapement attached, and compensation pendulum and maintaining powers. The clock has a solid horizontal cast-iron bed frame (which is fixed on strong cast-iron brackets bolted to the wall of the tower) and has all the latest improvements. The work has been done by Messrs. Potts & Sons, of Leeds.

The directors of the Crystal Palace Company, in deference to the wish of the electrical trade section of the London Chamber of Commerce, have decided to postpone the opening of the Electrical Exhibition from November 1891, till January 1, 1892, on which date the exhibition will be formally opened. We understand that the Chamber of Commerce proposed a



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further postponement, but the directors, anxious as they were to meet their views, could not agree to a later date than January 1 without breaking faith with a large number of exhibitors who have applied for space, and who are now preparing their exhibits. It will be gratifying to intending exhibitors to learn that, with the view of promoting the success of the exhibition, the Chamber of Commerce have agreed to appoint a committee to act with the directors of the Crystal Palace Company.

The Worcester City Council have agreed that permission should be obtained from the Local Government Board to borrow 1,800*l.* to put in stopcocks to prevent the waste of public water.

At a meeting of the shareholders of the Liverpool Overhead Railway the chairman announced that good progress was made with the construction of the line, which is to extend along the Liverpool docks for a distance of seven miles, and that the directors had decided to adopt electricity for propulsion, and had made a contract for the supply of motive power, and also for running the trams at a fixed charge for the next two years.

The work of reflooring Manchester Cathedral is to be taken in hand at an early date.

The Electric Lighting Sub-committee of the York Corporation have been instructed to visit places where the high and low tension of lighting is in use, and report.

The tender of Mr. J. R. Maw, of Hull, has been accepted by the Pontefract Rural Sanitary Authority for the execution of the waterworks scheme designed by Mr. Malcolm Paterson, C.E., of Bradford. The total cost of the scheme will be about 1,200*l.*

The position of the London wood market for July has, Messrs. Churchill & Sim state, been peculiar. While the prices obtainable for wood of almost every kind free on board at the foreign and colonial shipping ports have been advancing, and the markets at the chief English outports and Continental centres have been responding to this advance, rates in London, in spite of a very light importation and a fair demand, have rather receded than otherwise. This is difficult to account for; and it seems probable that when dealers return from their holidays, especially if a settlement of the labour disputes in the building trade can be effected in the meantime, a reaction must set in, the very unattractiveness of the London market furnishing a guarantee against the upsetting of the present healthy condition of affairs by an excessive importation.

The managing director of the Electric Construction Corporation, Limited, Mr. Ebbsmith, has resigned his official position, and has been elected to the seat on the Board vacated by the decease of Sir R. N. Fowler, Bart. Mr. Thomas Parker, the present works director, will in future act as general manager of the Corporation.

Tenders have been accepted by the Ribble Navigation Committee as follows:—For pair of horizontal pumping engines, hydraulic high-pressure and return water mains and valves, and machinery, penstocks, sluices, &c., Tannett, Walker & Co., 7,463*l.* 14*s.* 6*d.* Steel rails, chains, switches, crossings for railway sidings, crossings, points, &c., T. Summerson & Sons, 3,745*l.* Erection of engine and boiler-house, accumulator-house, chimney, &c., J. Christian, 2,650*l.* Roadmaking, Executors of T. A. Walker, 1,250*l.* Boilers and pumps and a Green's economiser, J. Foster & Sons, 1,130*l.* Laying the above-mentioned railway sidings, &c., Executors of T. A. Walker, 755*l.* Water-pipes, castings, hydrants, for gas and water supply, Allsup & Sons, 731*l.* 18*s.*

A series of five 3-inch "Abyssinian" tube wells have recently been put down in a field adjoining the Tuckton pumping station of the Bournemouth Gas and Water Co., by Messrs. Le Grand & Sutcliff, of London. A pumping trial test has been made for seven days, working continuously day and night, which has given very satisfactory results, as a uniform yield of over half a million gallons per day was obtained, which only temporarily lowered the head of water 7 feet.

Tenders have been invited for the enlargement of the two reception-rooms of the Devon County Lunatic Asylum, a grant of 600*l.* having been promised by the County Council.

The tender of Messrs. Kenyon & Moulding, of Blackburn has been accepted for altering and extending fire-engine station, Clayton Street, Blackburn.

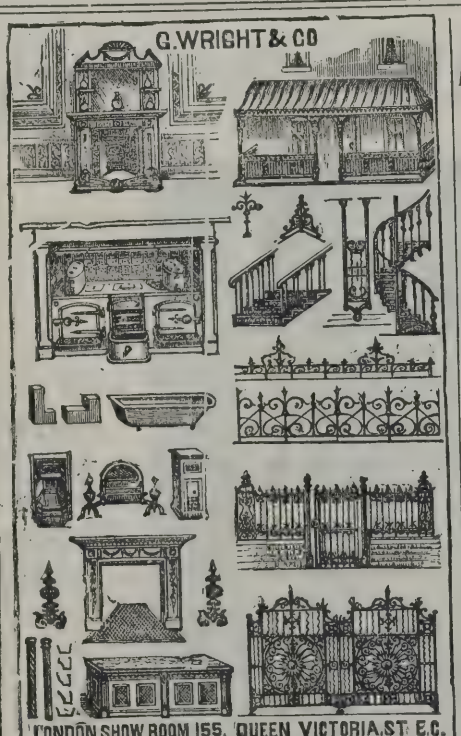
We lately mentioned the proposed sale of building land in plots at Hastings, on the St. Helens Park Estate. Messrs. E. & H. Lumley, auctioneers, of 22 St. James's Street, London, have since effected a highly successful sale. The estate, which comprises about 100 acres, was purchased some years ago by four gentlemen of Hastings, who have allowed the land to remain without much effort to realise it until now. Mr. Humphreys, architect, of Hastings, in conjunction with Messrs. Lumley, designed a plan of roads and plottings suitable to the conditions and formation of the ground. The result has been a singularly convenient scheme of frontages and well-planned

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roads, with a site for a church, a piece of ornamental water and a tan gallop of about a mile and a half. Before the sale commenced a lunch was given by the proprietors to the assembled company at the St. Helens Hotel. Mr. Henry Lumley afterwards proceeded with the real business of the day. Among the buyers, by themselves or their agents, were Messrs. Atkinson, M.P., Box, Jackson, Cheyney, Marshall, Hickman, Townsend, Hayes, Murray, Eldridge and Cousens. Some of the finest lots realised high prices, the general average being from 400*l.* to 600*l.* an acre, and it is expected that as the sales proceed—for it is intended to hold another sale soon, to be followed by similar proceedings at fixed periods—these prices will be doubled, for it is obvious that as sales continue to be made so the value of the remaining plots must increase.

THE expenditure of 1,700*l.* on the Kilkenny District Lunatic Asylum, 1,000*l.* on the Mullingar District Lunatic Asylum, 2,550*l.* on the Killarney District Lunatic Asylum, and 800*l.* on the Richmond District Lunatic Asylum, has just been authorised.

TENDERS have been accepted for the erection of a new chapel on the site of the present building belonging to the United Methodist Free Church at Littletown, Liversedge. The tenders amount in the aggregate to 1,800*l.*

AMERICAN NOTES.

PLANS have been prepared by Mr. A. P. Boller, architect, New York, for the new Seventh Avenue bridge across the Haarlem River. The structure is to be 67 feet wide, and is to have one of the largest draws in the world. It will cost at least 1,250,000 dols. The plans were referred to the Comptroller.

THE Exhibition directors have leased for three years a right of way that will enable every railroad in Chicago to enter the grounds. The right of way is a strip 50 feet wide, running in an irregular course from the entrance at Sixty-seventh Street to the Baltimore and Ohio tracks at Seventy-first Street, where that road leaves the Illinois Central. Four tracks will be built to make connections with the Baltimore and Ohio.

ACCORDING to the *Gloucester Chronicle*, it is stated that the Mayor and Council of Gloucester, Massachusetts, have decided to invite the Mayor and Corporation of Gloucester, England, to attend the 250th celebration of the formation of that city next year.

NOTES ON NOVELTIES.

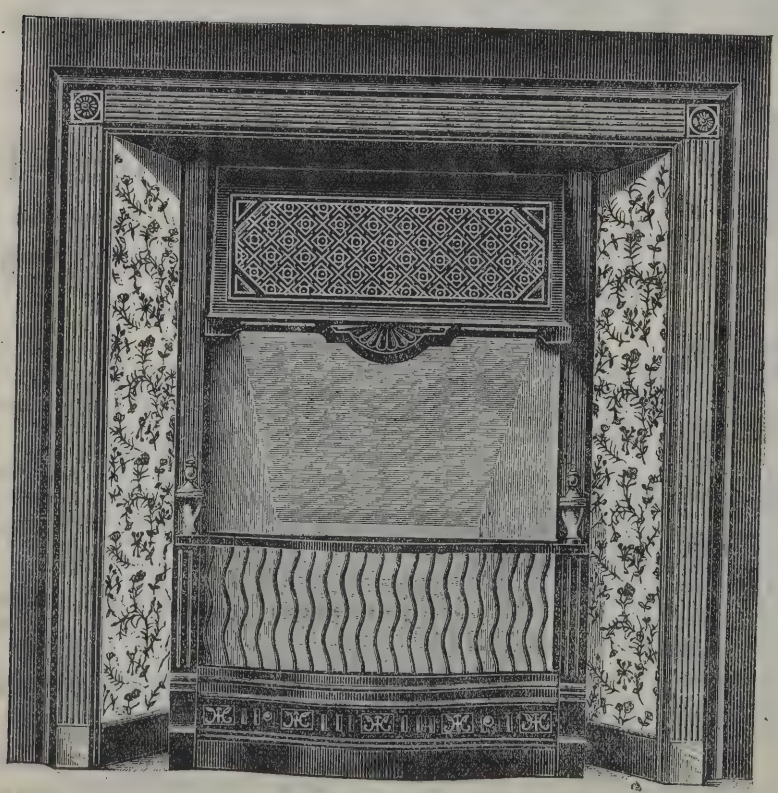
Ventilators.—That the English systems of ventilation and sanitation are universally approved is seen by the large share of the work which is entrusted to English firms of acknowledged ability. Amongst the latest of these contracts is one for the ventilation of large cotton and jute mills in India, given Mr. Arthur W. Stephenson, the engineer to the "Climax" Ventilating Company, of 15 Great George Street, Westminster. The exhaustion of the foul air is effected by a number of their direct-acting turret ventilators fixed along each roof, provision being made for the admission of a large volume of fresh air, which can be regulated by an ingenious arrangement, or its temperature reduced to any extent, according to will. The company are also carrying out the ventilation of an art gallery in New York, neither trouble or expense being spared. The external ventilators are specially designed to harmonise with the architectural features of the building, and the internal fittings of a most elaborate kind work in with the interior decoration. The "Climax" Company are carrying out the ventilation of large powder mills in Kent, and of a new church in Essex. The former is the first time a work of the kind has been undertaken, it being required to reduce the temperature from 108 deg. to 60 deg. The latter consists of a "Climax" direct-acting ventilator as a feature on the roof at intersection of chancel and nave. This ventilator when completed will be one of the highest, if not absolutely the highest in the kingdom, height from ridge of roof to top of finial being over 45 feet. The firm already hold gratifying testimonials.

ARTISANS' DWELLINGS IN DUBLIN.

AT the meeting of the Dublin Corporation the following report was submitted from Sir Charles Cameron, superintendent medical officer of health, in reference to the erection of artisans' dwellings at Blackhall Street :—

"You have asked me to report upon a scheme for converting a number of houses belonging to the Corporation into tenements, and also for the erection of two-storey dwellings for the working-classes. I have examined the plans for the proposed scheme, and have inspected the houses proposed to be converted into tenements. With respect to these houses I regret the proposal to adapt them as residences for artisans, and for the following reasons :—1. I am opposed to the providing by

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PATENT No. 2496. A.D. 1884.

local authorities of dwellings which let at rents exceeding 3*s.* 6*d.* per week. It would be better to allow building societies and private persons to provide dwellings for the respectable working-classes who can afford to pay higher rents. In my opinion the only excuse for the erection of dwellings by a municipal Corporation is that such a procedure tends to promote the public health. The germs of the infectious diseases find an abiding-place and a hotbed in the homes of the poorest and most squalid classes. There are few persons willing and able to provide improved accommodation for the lowest classes, because the rents which the poorest people can afford to pay would not give a sufficient return for money invested in providing dwellings for them. These poor people are now lodged in dilapidated old houses and converted stables, and their landlords generally are middlemen, who rent the houses and sublet them to the tenants. These middlemen do nothing to improve the wretched tenements which they farm, and even if they were willing to do so, they have no means for carrying their desires into effect. Hundreds of the tenement-houses inhabited by the labouring classes have been detenanted and closed through the efforts of the Public Health Committee and their staff; but there are still thousands of people living under very insanitary conditions, and for whom it would be most desirable to provide improved dwellings. The money which Lord Iveagh has given for providing dwellings for the working classes will, I believe, be expended in building tenements which will be let at not more than two shillings per week. This money will, therefore, do real service, for it will help the classes who most need assistance. The Corporation tenements in Bow Lane are also of the class most required, as they are let at rents varying from 2*s.* to 3*s.* 6*d.* per week. It would be desirable even to have tenements at 1*s.* and 1*s.* 6*d.* for the very poorest people, whose homes are usually indescribably wretched and insanitary. Every tenement which a local authority provides at a weekly rent less than 3*s.* 6*d.* replaces an unhealthy dwelling; but every tenement at a higher rate would not necessarily replace an insanitary dwelling. 2. I think the Corporation houses in Blackhall Street ought to be repaired and let as dwellings, each for one family. I am pretty sure that they would all soon be let if they were made attractive. The street is a very fine one, and being near the new barracks at Grangegorman they might be let furnished or unfurnished to officers by the persons to whom the Corporation would lease them. The houses on the opposite side of the street, which are the property of the King's Hospital, and which are now in tenements, will probably be repaired and let as dwellings for single families. The fact is that the houses in this street would probably have remained houses for single families had they not got into the hands of house-jobbers, who converted most of them into tenements, so that they might get a bigger profit out of them. The result now is that the tenement houses have been literally wrecked, whilst those that still remain private houses are in excellent condition. 3. With respect to the plans for converting Blackhall Street houses into tenements, I beg to remark that the proposal to form the basements into dwellings is against the letter and spirit of the Public Health Act, 1878; and it would not be to the credit of a sanitary authority to break itself the laws which it administers in the case of others. No sanitarian could approve of families being altogether located in underground dwellings into which the rays of the sun never penetrate. In conclusion, I would take leave to recommend that any dwellings which may be erected by the Corporation in this or any other locality shall be let at rents not exceeding 3*s.* 6*d.* per week."

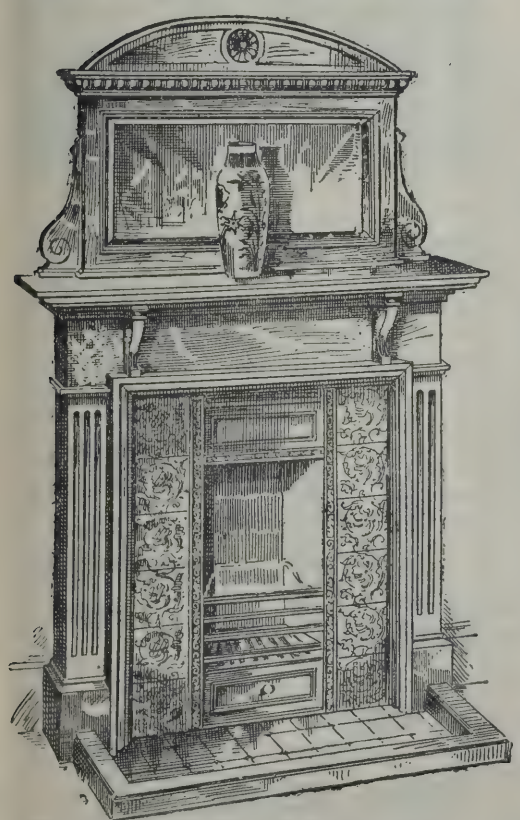
Mr. Spencer Harty, borough surveyor, reported as follows:—"As you are already aware, these houses were originally built for the occupation of one family; they are four storeys over the basement, and are extremely airy and good buildings for the purposes proposed. The ground floors are composed of two rooms varying in size, the one from 14 feet 3 inches by 17 feet 6 inches to 15 feet 6 inches by 18 feet 5 inches, and 15 feet 10 inches by 16 feet, the other from 19 feet by 13 feet 9 inches to 21 feet by 14 feet, with a good open hall and staircase, and rooms and hall well lighted; the remaining floors are all similarly good, that on the third floor being very good, and is divided into three apartments. The height of the ground floor from basement to ceiling is 10 feet, that of the first floor 11 feet 6 inches, second floor 10 feet 6 inches, and third floor 8 feet; indeed there are very few houses in Dublin in which the cubical capacity of the rooms is so large. The design of the dwellings is so arranged that each tenement will have a separate w.c., scullery and pantry to itself, and on a separate landing, and perfectly isolated from the other tenements. It would be well for the public health if all tenement houses were similarly arranged. With regard to the basement, Sir Charles Cameron takes exception to them as not complying with the 83rd section of the Public Health Act. This section, with the preceding one, says it shall not be lawful to let or occupy as a separate dwelling underground rooms unless the following provisions are complied with:—Unless the cellar is 7 feet high. The cellars in basement of these houses are 9 feet high.

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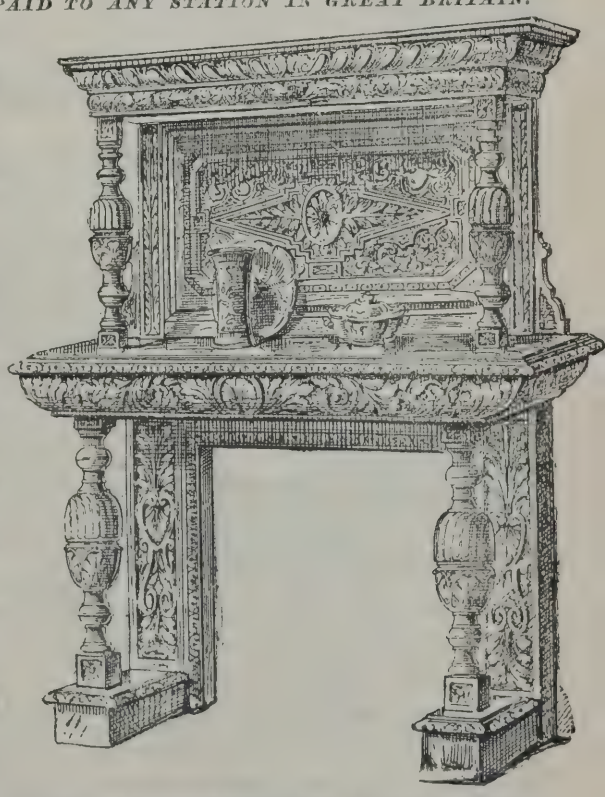
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Unless the ceiling of the cellar is 3 feet over surface of surrounding ground. Those proposed to be dealt with are from 9 inches to 1 foot 4 inches. Unless there is an open area 2 feet 6 inches wide. The area proposed for these dwellings is 8 feet wide at back and 6 feet in the front. Unless the cellar is properly drained, which these will be, the drainage proposed to be taken to the back and not through the houses. Unless there is a proper w.c., which they have. Unless there is a fireplace, &c., which all of these proposed dwellings will have. From the foregoing it will be noticed that we more than comply with all the exceptions except in the one case, and that is, that the ceiling does not stand 3 feet over the ground; but in my opinion these basements as proposed will receive more sunlight and air with areas 8 feet and 6 feet wide respectively than with 2 feet 6 inches wide, as proposed in the Public Health Act. Sir Charles Cameron is opposed to the lettings at the rents proposed; in that case, what is to be done with the houses? They cannot be let to single families, unfortunately, as there are none to take them, and are they to be allowed to go into ruin and decay, and remain as at present in the occupation of poor roomkeepers, paying no rent? If the Blue Coat Hospital authorities will take them at a reasonable rent, put them into proper repair and guarantee to let them to one family only, it would undoubtedly be a good arrangement and most unobjectionable; but I have seen no such offer. If, however, the basements in this case are so strongly objected to, why not use them for washhouses, and I am sure the other tenements in the house could afford to pay an additional sixpence a week for the sole use of them for one day each. At present I can see no reason to object to the alteration as proposed."

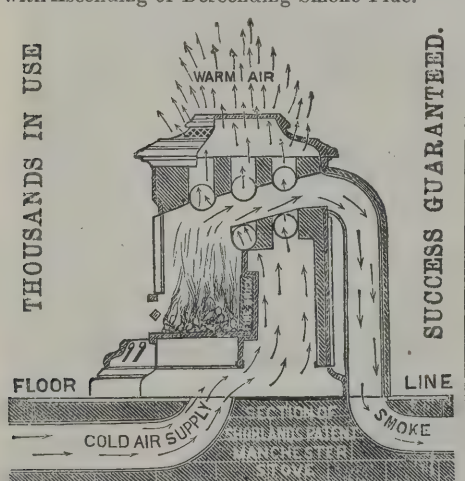
ARUNDEL WATER-SUPPLY.

THE articles of agreement between the Duke of Norfolk and the Corporation of Arundel relating to the water-supply have been signed. The Duke agrees to pump and supply, at his own expense, water for domestic and other purposes for the use of the inhabitants of the borough and parish of Arundel, and to contribute towards the cost of a new scheme of sewerage and drainage for the borough and parish. In consideration of the Town Council carrying out an approved scheme of drainage the Duke offers to supply every house in the borough with an efficient water-supply, to lay the mains and erect the necessary pumping station and apparatus at his own expense, reserving to himself the right of passing water through the town mains to his own property outside the borough. He gives over the mains to the Town Council, and an average supply of 75,000 gallons per day, and a greater quantity available at 1*s.* per 1,000 gallons. The supply may be discontinued on a year's notice, but such notice will not be given before the end of two years. The Corporation will not make any charge for water rates to the consumer for domestic purposes, but the Town Council are at liberty to charge for all water supplied to any house or premises above thirty gallons a day for each occupant of a house. Other provisions are that the Corporation should use their best endeavours to divert Mill Lane; agree to sell Gorringe's meadow for 500*l.*; and to carry out a complete scheme of drainage in four years, towards which the Duke of Norfolk will contribute 1,000*l.* in payment by instalments of 250*l.*, payable when the work is completed. The Corporation will connect their sewers with the drains of all the houses and cottages in the borough at their own cost, and defray all costs and charges incurred in such work out of the current rates, and they shall not borrow money for the purpose of such work without the consent of the Duke.

THE MERSEY BAR.

ACROSS the estuary of the river Mersey there exists a broad ridge of sand which seriously interferes with the navigation of the river. Vessels of deep draught cannot go over the bar except for a couple of hours before and after high water. This involves not only a loss of time, but a serious risk of danger while the vessels are cruising about waiting for the tide. The bar is supposed to be produced by the action of the tides, the sand which is held in suspension being precipitated in the slack water, where the ebb and the flood tides meet. The Mersey Dock Board, who are the conservators of the river, have hesitated to meddle with the bar, lest by shifting the sand in one quarter they might create greater mischief elsewhere. Some time ago, however, it was determined to make an experiment for the removal of the bar, or at least for deepening the channels of navigation which now intersect it. It was resolved to use steam dredges of great power. The vessels are fitted with adjustable pipes, the nozzles of which pass over the surface of the sandbanks, and, by means of pneumatic pumps, suck up the sand and discharge it into barges alongside. By these

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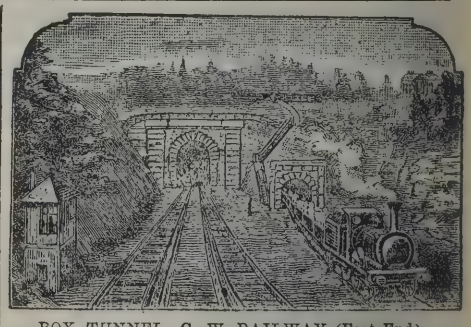
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barges the sand is carried away to distant places, where it is deposited. Mr. G. F. Lyster, engineer to the Mersey Board, in his official report just issued, gives the results of the operations so far as they have proceeded. After less than a year's work the quantity of sand removed up to the present time is 350,000 tons. The original estimate was that the removal of 800,000 tons of material would, provided there was no re-deposit, effect a deepening of 6 feet 6 inches below the shallowest depth then found, viz. 11 feet below low-water spring tides, for a length of channel of 3,000 feet, with a width of 1,000 feet. The amount removed up to date—viz. 350,000 tons—is equal to seven-sixteenths of this whole quantity. Comparing the most recent soundings with those taken at the commencement of the operations, it is noted that in the immediate proximity of the line on which the dredging is proceeding there were originally several soundings showing a minimum depth of 11 feet below low-water spring tides, whereas at the present time the shallowest soundings in the immediate proximity of the line show depths of 13 feet and 15 feet below the same *datum*, the deepest soundings being some 300 feet northward of the leading line, where depths of 15 feet and 16 feet are indicated. It may, therefore, be fairly inferred, Mr. Lyster thinks, that the improvement is attributable to the dredging operations.

BUILDING WITHOUT AN AGREEMENT.

On Monday, at the Sussex Summer Assizes, the case Hill *v.* Stephens was heard before Mr. Justice Hawkins. The plaintiff, Mr. Charles Hill, builder, of Brighton, sued Mr. Stephens to recover 274*l.* 9*s.* 2*d.*, for work and materials supplied. The defendant put in a counter-claim for 200*l.* Counsel for plaintiff said the amount claimed was the balance of an account for work done and materials supplied in building two houses. The defence was that it was agreed that the houses should be built for 300*l.*, and in the alternative that the plaintiff's charges were excessive. The defendant also alleged that the houses were not built in a workmanlike manner and were unfit for habitation, and that for this reason they were unlet for some time, and for this the defendant claimed 200*l.*—The plaintiff, on being called, stated that in July last year the defendant called at his house and stated that he wanted two houses built. He had no plans. Witness said he did not mind undertaking the work. Defendant said he wanted some good houses, and witness asked what he would pay for them. Defendant said he would pay 300*l.* Witness said he supposed he wanted two good houses, and defendant replying in the affirmative, witness said he must decline the offer with thanks. In three weeks' time defendant called again and said he had talked the matter over with his daughter, and they had decided that he should do the work. Witness then said they had better have an agreement, and defendant said he did not think it was necessary, as he had heard a good character of him. He said the chief thing was he wanted to keep the houses down as low as possible. They then adjourned to defendant's house, and witness said if he wanted the houses to keep he had better have rather thicker floor-boards than usual, and have Lancing brick and land sand used. He told defendant he had no capital, and he should require money to pay wages and some for capital. He duly carried out the work. After he had started the plans were altered, and he did extra work at the request of the defendant. Defendant came to see the work as it progressed, and gave orders to the workmen. The work he executed cost considerably more than 300*l.* There was no contract.—Cross-examined: He did not first speak to the defendant about the houses at defendant's house. Defendant did not tell him that he only had 300*l.* to lay out, and he (witness) did not say he could do the work for that. Mr. Stephens gave him an order, to an extent, to build the houses before he showed him the plans.—Re-examined: Defendant did not ask him what the houses would cost.—Frederick Richardson, a bricklayer, stated that he worked on the houses. Defendant was frequently there, and suggested improvements. He never told witness that the plaintiff had agreed to build the houses for 300*l.*—Cross-examined: Defendant instructed him to carry back the offices 2 feet.—Charles Anderson, a painter, stated that defendant was frequently on the job, but never told him that the contract price was 300*l.*—David Pearce, a plasterer, who undertook some plastering for 30*l.*, said defendant asked him to put in extra work if he could. Mr. Hill also ordered extra work to the extent of 8*l.* 10*s.*, and he was paid for this.—Mr. William Parnacott, the surveyor, stated that he had been over the two houses and measured them. It would be impossible to build them for 300*l.*—Mr. George Holloway, builder, also said the houses could not be built for 300*l.*—Mr. Mabson, assistant in the office of the Borough Surveyor, at Brighton, stated that he examined the houses and passed them.—This completed the evidence for the plaintiff. The defendant was then sworn, and stated that he sent a note to the plaintiff, and he came to his house and not to his place of business. His

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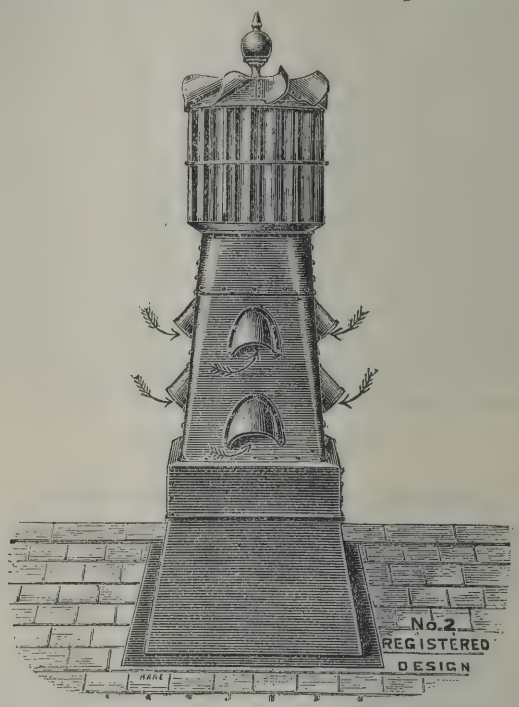
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wife and his daughter were present at the interview; his wife being present the whole time, and his daughter a part of the time. He showed plaintiff a plan, and asked if he could build the houses for 300*l.*, and he said he could and would do the work to his entire satisfaction. Plaintiff said he was willing to sign a memorandum. Witness told him he could finance him to the extent of 10*l.* per week until the time arrived for the completion of the work. No other conversation took place about the price, and he considered it conclusive. He never interfered with the work in any way. He did not give instructions for the back offices to be carried back 2 feet. The work was only carried out according to the plans. When he received a letter demanding the balance claimed by the plaintiff he was surprised. In reply to his lordship defendant said the houses faced the Corporation ashyard.—His lordship: A very agreeable spot.—In reply to further questions defendant said the houses were rated at 13*l.* a year. He let the houses at 10*s.* per week and paid the taxes. When the houses were first let they were not really fit for habitation. The chimneys were not carried up above the roof, and on one house there were no chimney-pots.—By Mr. Day: His daughter attended the same church as the plaintiff, and she recommended him as being a good honest man. He had not applied to any other builder to build the houses for 300*l.* He had offered to sell the ground to Messrs. Davey, but did not ask them to tender for the houses. They did not come to terms for the ground. He might have asked Mr. Strong to build the houses for 300*l.* He thought he did. Mr. Strong was very busy at the time, and said he would rather be without the job. He also spoke to Mr. Jackson about the houses, and his price was 350*l.* or 360*l.*—Re-examined: The houses were not finished at the present time. Whenever he spoke to people about the houses he always limited his capacity to 300*l.*—Miss C. H. Stephens, daughter of the defendant, stated that she recommended the plaintiff to her father believing him to be a straightforward man, and she was present when the plaintiff agreed to build the houses for 300*l.*—Mrs. Stephens also gave evidence to the effect that plaintiff agreed to carry out the work for 300*l.*—After his lordship had summed up the jury found that there was no contract, and the foreman said they felt there had been a misunderstanding.—Judgment was given for the plaintiff upon this point, and the question of value then arose, and it was decided to refer this to an arbitrator, together with the claim by the defendant for damages on account of alleged unnecessary delay.

FRYER'S VENTILATORS AND COWLS.

IN our recent notice of Messrs. J. D. & W. Fryer's ventilators and cowls we were able only to give an illustration of the cowls. We now give an illustration of Fryer's patent revolving



ventilators, as our description of them appears to have aroused considerable interest in these specialties of Messrs. J. D. & W. Fryer.

BRICKWORKS AT WEST HARTLEPOOL.

MESSRS. CASEBOURNE & CO., LIMITED, cement and brick manufacturers, of West Hartlepool, have just started new works on land lately acquired by them adjoining their cement works, for the manufacture of bricks by a patent process, the invention

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of Mr. E. Cammiss, who has for many years been foreman of the company's brickworks at Cowpen. The process is designed for dealing with clays containing lime and other foreign matter, and which under the ordinary process would be unfit for the manufacture of bricks. In the first instance the clay is reduced to the consistency of thick cream in a wash-mill which eliminates all stones, &c. It is then pumped to the wet mill, where any stones larger than a pea are reduced and ground in with the slurry. From the wet mill it passes to the drying-flats, which are heated by waste heat from kilns and exhaust steam from engines. After drying it is ground in a perforated pan and conveyed by an elevator to the pug-mill, where, after being mixed with the minimum quantity of water to make the clay "bind," it is fed into the brick machine. This consists of a revolving table with a number of moulds, into which the clay is tightly pressed. The rough brick then passes automatically to the press machine, where it receives the final pressure, and comes out with the smoothness of a block of chocolate. The brick is then ready for the kiln, to which it passes direct.

The bricks when burnt are of good shape and colour, and have been favourably recognised locally from the fact that the company has already booked orders for some months ahead. The brick machinery has been constructed by Messrs. Bradley & Craven, Wakefield; slurry pumps, wet mill, &c., by Mr. T. Fawcett, Leeds, and iron corrugated roofing by Messrs. Motley & Green, Leeds. Plans for works were entrusted to Mr. C. B. Casebourne, of West Hartlepool, and carried out under the supervision of Mr. C. T. Casebourne, C.E., managing director to the company, who, with a number of gentlemen, including Mr. G. T. Reay, Mr. E. Cammiss, Mr. Craven, Captain Motley and Mr. W. H. Casebourne, witnessed the opening of the works early in July.

THE GERMAN EXHIBITION.

THE open air attractions offered to the public just now have probably had something to do with the postponement of the Promenade Concert season at Covent Garden. At the German Exhibition the authorities are sparing no efforts to make the military spectacle "Germania" as perfect as possible. With the alterations recently made, it might almost be said to be a new attraction. Not the least interesting addition to the performance is a well-contested full-uniform race by the cavalry, whilst a feature is made of the target practice in which a trooper of the Guards rides past a target at full tilt, and displays his marksmanship with both rifle and revolver. The management are working in the right direction in constantly adding to the attractions of the largest outdoor entertainment in London.

The "Welcome Club," which has been the "English corner" in all the international exhibitions held at Earl's Court, is now stronger than ever. From a membership of about 500, it has, during the run of the German Exhibition, increased its membership to close upon 1,200. The pretty grounds attached to the club have, no doubt, had much to do with its success, whilst the lady voucher system has been received with much favour. Mr. Owen, the hon. secretary, has been untiring in promoting the comfort of members and their friends.

Mr. John R. Whitley has received letters from Queen Victoria and the German Emperor, thanking him for the specially bound copies of the official publications of the German Exhibition which he had forwarded to their Majesties.

ELECTRIC APPLIANCES.

AMONG the exhibits of private firms at the Naval Exhibition now open at Chelsea is one belonging to Messrs. Woodhouse & Rawson United, Limited, of 33 Queen Victoria Street, London. This enterprising company have just completed, to the order of the British Government, the launch *Electric*, of which we give an illustration. This has been specially designed



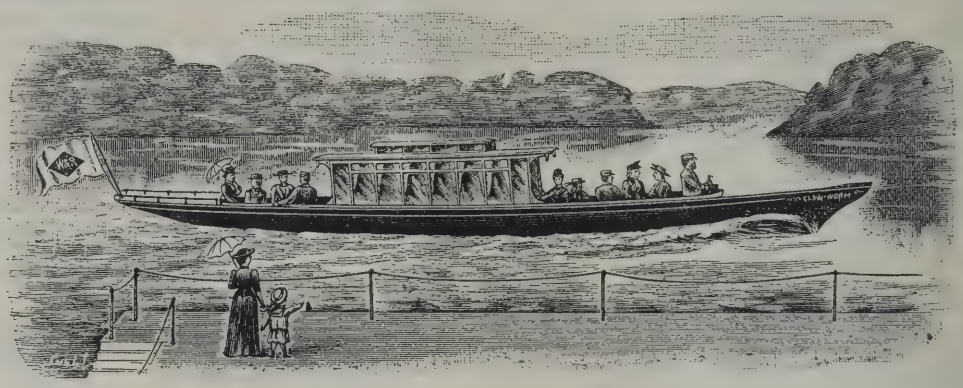
for the conveyance of troops from one part of Chatham Dockyard to another, but it is intended to carry out with it an extensive series of trials, so that the merits of electricity as applied to the propulsion of small vessels may be thoroughly investigated.

At the company's launch works near Kew there are at present several launches, varying in size up to 50 feet in length,

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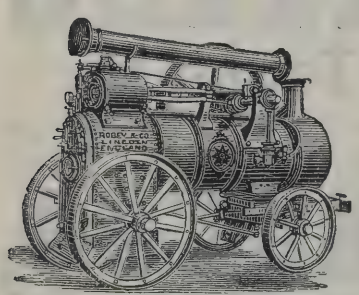
in course of construction. Models are shown of some recently-delivered, amongst which we notice one of the *Colondrina*, 53 feet long, which has been built for the Mexican Government. Although some of these are steam launches, it is satisfactory from an electrical engineer's point of view to know that the demand for electrically-propelled boats is increasing so rapidly that the company have felt it to be necessary to open a charging station near the works, where the accumulators may be recharged. From the illustration of the *Glowworm*, just completed for Mr. Pears, which will carry forty passengers and travel at the rate of nine miles per hour, it will be seen how much more convenient and pleasant these boats are than those in which the centre is occupied by a steam engine, however well designed or carefully constructed. To show how easily electricity lends itself to launch propulsion, the manager of the company's boat-building department has constructed a working model in which the screw is attached directly to the axle of the armature of the motor.

In another part of the stall we notice a small model of Bolton's electric winch. The high speed at which an electro-motor economically rotates is in this machine reduced by means of a screw gearing into a toothed wheel. The company have great confidence in this special application of the electric current, and are sure that it only requires to be more generally known to be extensively adopted. While search-lights of all sizes are shown at this exhibition, the company invite inspection of a model which will soon find favour with the naval authorities. Instead of a mechanically-worked arc, the light is obtained from an incandescent block of marble. This lamp was introduced some years ago as the "Sun" lamp, but owing to defects in design, it did not meet with much favour. It has, however, now been perfected, and is about to be introduced to the English market. Its perfect steadiness and freedom from mechanism will commend it to all. The company also exhibit a number of hand-lanterns made of thick glass, in which the incandescent lamp is entirely enclosed, so that there may be no danger from breakage as the lamp is carried from one part of the ship to another. There is also a selection of lampholders and lanterns for affixing to partitions and attaching to ceilings in fitting-up installations on board ship. The advantages of the single-stroke Jenson bell, particularly as adapted for signalling purposes on board ship, are shown to all who may be willing to pause for a moment, while it is almost needless to say that the quick-break switches, for which the company are so well known, are also shown. We notice that both in the sample of the 1,000 ampère, and the 3-way 500 ampère types, that sockets are provided for "sweating in" the cables. A 6-way distributing switchboard, and a number of Cunynghame Woodhouse & Rawson's magnetic cut-outs are also on view. These appear still to be in great demand, and although one of the first safety devices introduced, they appear to be still great favourites.



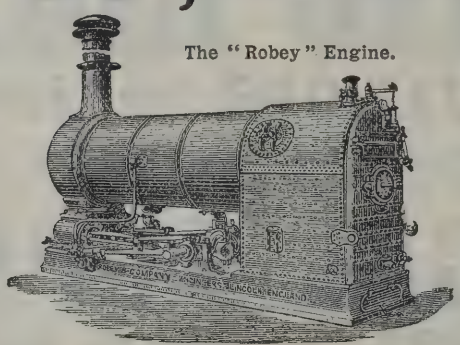
A fully detailed description of all the apparatus shown by this pushing firm would require far more space than we can at present spare. We would merely add that there are numerous

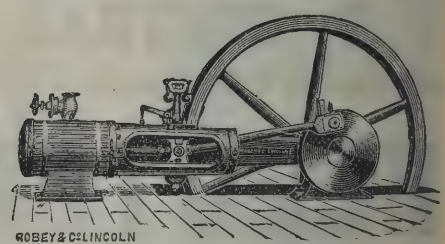
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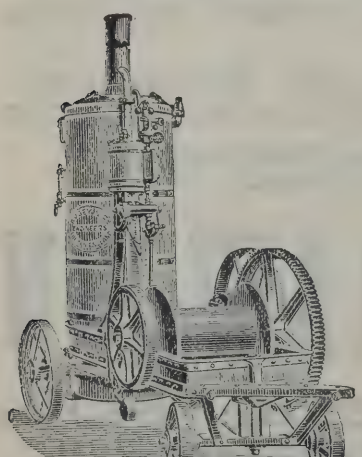
The "Robey" Engine.



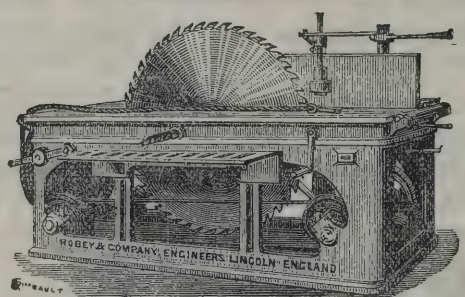


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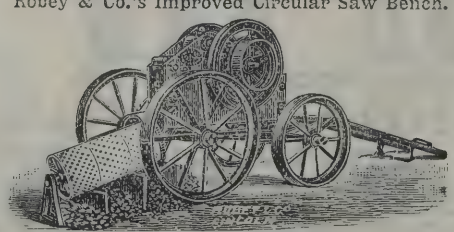
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EXAMINATION QUESTIONS

THE following questions were proposed this year in the examinations of the City and Guilds of London Institute :—

CARPENTRY AND JOINERY.

Ordinary Grade.

1. In what way does pitch pine differ from deal, and to what uses is each applied?

2. State how you would determine the quality of good and bad wood by smell and colour.

3. By what names are the several qualities of Memel, Riga and Dantzic known? Give particulars of each.

4. It is required to cover a building 40 feet wide with a ridge roof, at an angle of 32 degrees. Give an elevation of the truss you would use (scale, 4 feet to an inch).

5. Give enlarged details of each joint of the truss you propose in reply to the foregoing question. Figure on the sizes of the timber and show ironwork.

6. Give sketches to a scale of half an inch to the foot of all the joints applicable to a wall plate, and state under what conditions they are commonly used.

7. Give particulars of the form of roof-framing known as "De Lormes," and explain same by sketches.

8. Give an elevation, to a scale of half an inch to a foot, for a centre to a 3-feet brick arch, 20 feet clear opening, with 5 feet rise. Specify the several sizes, and show joints by dotted lines.

9. It is required to cut an opening 12 feet high and 14 feet wide for a shop-front, in a newly-built 18-inch wall, 20 feet long and 40 feet high. Show the shoring you would use, and give the scantlings of the timber.

10. Explain by sketches the following terms applied to doors :—"Ledged and braced;" "framed, ledged and braced;" "bead butt and flush."

11. Give sketches, to a scale of half an inch to a foot, of the various joints used in a double-framed door.

12. Describe "joggling" and "indenting," as applied to beams.

13. Give plan and section of the frame and sash of a 3-light casement. Show by enlarged sketches how you would arrange to make it watertight.

14. What is the safe distributed load to be placed on a beam of Memel, 12 inches by 6 inches; opening 12 feet; the ends of the beam being fixed.

15. Give plan and section, to a scale of half an inch to the foot, of an open newel staircase, 3 feet 3 inches wide, stairs to land on quarter space at 9 feet from floor. Height, floor to floor, 12 feet. Width of hall, 7 feet 6 inches.

16. Show the setting out, to a scale of half an inch to the foot, of two lower curtail steps to a 4 feet 6 inches staircase. Explain their construction, with sketches.

Honours Grade.

1. Give a short summary of the various European firs, and state the purpose for which each is best adapted.

2. Give particulars and uses of four different kinds of oak.

3. Describe the following woods, their appearance and any special characteristics :—Teak, Kauri pine, spruce, white oak. Say from whence obtained, and for what purposes each is best adapted.

4. Give a section, to a scale of 1 inch to the foot, of a tusk tenon. Give Tredgold's rule as to proportion and position of the tenon, and state when the rule does not give the strongest result.

5. It is required to cover a clear space, 27 feet by 22 feet, with a lead flat, having a parapet wall on all sides. Give plan and section, to a scale of 4 feet to an inch, showing arrangement of timbers, gutters, drips, &c. (The plan need only show one half of the flat.)

6. A party wall has to be rebuilt to a four-storey house. Front wall 45 feet high to top of parapet. There is a basement and there are cellars under the pathway. Give sketches, to a scale of 4 feet to an inch, showing how you would shore up the front wall.

7. It is required to erect a temporary stand, to accommodate 100 persons, to view a procession. Site available, frontage 33 feet 4 inches, depth 15 feet. Give half plan and complete section, to a scale of 4 feet to an inch, showing the construction.

8. It is required to erect an overhanging wooden bay window at the first floor level. The bay to be 7 feet wide, with 2 feet projection. Give sketch to a scale of half an inch to the foot, showing construction.

9. Show by plan, to a scale of half an inch to the foot, how you would arrange folding shutters to a window opening



6 feet 6 inches wide, in an 18-inch wall. Show linings, architraves, &c.

10. Give an elevation, to a scale of half an inch to a foot, of a centre for a gauged brick arch in a 2-feet 3-inch brick wall. Clear opening 18 feet, with 17 feet rise. Show wedges, &c., complete.

11. A wooden beam constructed of two 14 inches by 4 inches deals, having a 1-inch wrought-iron flitch, has been placed across a 12-feet opening. State what is the safe load that it should bear. Also state what difference it would make if the flitch were reduced in thickness to half an inch.

12. A girder over a clear space of 25 feet has two binders secured thereto, each at a distance of 8 feet from the end, and each transmits a weight of 5 tons to the girder. State what should be the section of the girder.

13. Give section and plan, to a scale of half an inch to the foot, of a shop front. Frontage 20 feet. It is required to give light to the basement through the stall board. (The upper portion of the shop front need not be shown.)

14. Show how you would set out a moulded handrail to a geometrical staircase, which has 8 winders. Well-hole 1 foot in the clear.

15. It is required to place a wood-framed octagonal ventilating turret, 4 feet 6 inches in diameter, rising 10 feet above the ridge of the roof. Give section and plan to a scale of half an inch to a foot.

16. Show by sketches how you would obtain the intersection of a circular wood rib to an octagonal, and also to a circular pendentive.

BRICKWORK AND MASONRY.

Ordinary Grade. Section I.

1. If small pebbles are allowed to remain in clay used for making bricks, what is their effect upon the brick when burnt?

2. What precautions should you consider it necessary to take in using road-drift instead of sand for mortar?

3. What should be the width and thickness of the concrete foundation for a 2-brick wall in ground of a somewhat treacherous character?

4. Draw, to a scale of 1 inch to the foot, plans of two successive courses of bricks, at the angle of a house where a 2-brick wall meets a 1½-brick wall English bond.

5. Explain fully the fundamental difference between limes and cements. How is Portland cement manufactured?

6. What is tuck-pointing? Give your reasons for approving or disapproving of it.

7. What materials are chiefly used for damp-proof courses, and how are they applied?

Section II.

8. Describe any artificial stone that you may be acquainted with, and state the purposes for which you would use it.

9. The wall of a building is to be 18 inches thick, and to be built of ashlar stone, backed by brickwork. Draw a vertical section and a horizontal plan of the wall, each 6 feet long, to a scale of 1 inch to the foot. Explain the precautions which a mason should take in building the wall.

10. Draw, 1 inch to the foot, a section through a stone window sill, 6 inches deep in a 14-inch brick wall, showing the wooden sill of the window also.

11. Explain fully how a plain surface is formed on a large block of rough stone.

12. What ill effects should you consider likely to result from the beds of the stones used in a building not being worked perfectly true over the whole surface?

13. Describe the nature and properties of the principal building-stones used in your district.

14. Explain fully what is meant by "bedding sills hollow," and why this is necessary.

Honours Grade.—Section I.

1. Write a specification for the composition of concrete (*a*) for foundations of a heavy building in a damp soil, and (*b*) for arches between iron girders to form a floor.

2. What is the effect of severe frost on mortar and concrete? What precautions should be adopted with brickwork which must be carried up in frosty weather?

3. Explain fully how you would construct the foundations for a large building in marshy ground, where no solid bottom can be obtained.

4. Explain what is meant by rich and poor limes. Which will carry the most sand, and for what purposes are they respectively used?

5. What proportion should the least thickness of a brick pier bear to its height? Calculate the greatest safe load for a brick pier 3 feet by 2 feet 3 inches and 10 feet high.

6. Describe the different kind of materials used for paving in your district.

7. The accompanying diagram represents the front wall of a corner house. It is desired to remove this wall entirely in order to turn the ground floor into a shop, and to carry the

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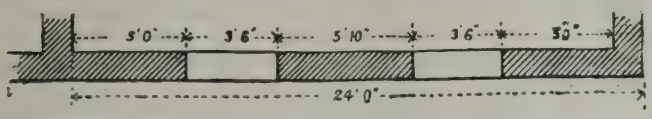
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upper portion of the wall on a girder. Describe fully, by means of diagrams, how you would shore and support the house during



the insertion of the girder. There are two storeys above the ground floor, and the total height of the wall from ground to parapet is 32 feet.

Section II.

8. What is the composition of the following stones, and for what purposes are they used :—Ancaster, Beer, Bramley Fall, Craigleith, Caen, Kentish rag, Portland?

9. Explain, by means of a diagram, the true object of buttresses in such a case as the external wall of a church, and the theoretical value of pinnacles crowning them?

10. Find the thickness of a rectangular wall 16 feet high, built of stone, weighing 145 lbs. per foot cube, which will just turn over under a wind-pressure of 40 lbs. to the foot super. The strength of the mortar may be neglected.

11. Draw a plan and elevation, ½ inch to a foot, of a three-light lancet window in a stone wall 3 feet thick, the extreme clear height being 14 feet and the clear total width between the inner sides of the jambs 8 feet.

12. Describe the different kinds of vaulting to be met with in English ecclesiastical buildings.

13. Describe how you would roughly test the weathering properties of a stone when time would not admit of a practical trial.

14. In building walls of coursed rubble with ashlar quoins, describe fully the points that ought to be specially attended to, and write a short specification for the composition of the mortar.

PLUMBING.

1. Where the supply of water to a valve closet is restricted by the water company, describe briefly, and show by rough sketches, the kind of water waste-preventer you would recommend; state the size of the pipe you would fix to supply the waste-preventer from a cistern fixed about 15 feet or 20 feet above it, and the size of the service-pipe you would fix between the waste-preventer and the closet-basin.

2. Understanding a tack for a lead soil-pipe to be a piece of lead about 9 inches by 9 inches, or 10 inches by 9 inches, and an ear or lug to be a thick piece of lead cast or cut to shape, about 2 inches by 2 inches, to match, it may be, the ear of a neighbouring cast-iron rain-water pipe, how many tacks would you solder to a stack of soil-pipe 50 feet high, for securing it to a brick wall, and how many wall hooks would you fix to each tack; or, if ears were insisted on, how many ears would you solder to the 50-feet length of piping? Show by rough sketches how you would solder the tack and ear respectively to the soil-pipe, and state which of the two methods you would prefer to adopt for securing the pipe to the wall, and give reasons.

3. It is required to fix a stack of soil-pipe in a chase in the internal face of an external wall of a four-storeyed house, with a branch from a closet on each of three floors, the closet on the ground-floor being of the pedestal wash-down kind, with an earthenware trap; that on the first floor being a valve-closet, with a lead trap; and the one on the third floor being a wash-down basin, with a lead trap under it, and a table-top for receiving slops. Describe briefly, and show by rough sketches, how you would treat the whole of the plumbers' work, the cistern for supplying the water being fixed on the fourth floor, directly over the closets, with no restriction as to the supply.

4. What are the properties of lead, and from what ore is lead chiefly obtained? Briefly describe the best process you know of for extracting lead from the ore, and running it into pigs, and how pigs are converted into sheets and pipes respectively.

5. How would you secure lead hips to roofs that are nearly vertical, with wings or sides on the slates, 6 inches wide, so that the lead may be retained permanently in its position, and what should be the maximum length of the pieces of lead you would fix for the purpose?

6. A range of four flushing-rim valve-closets is to be supplied from a cistern, 15 inches deep, fixed directly over, with its bottom 4 feet above the top of the closet, and one general service-pipe is to be fixed from the cistern with a branch to each closet. State the sizes of (*a*) the general service-pipe, (*b*) the branches, and (*c*) the supply-valve to each closet.

7. How would you fix the apron flushing, cover a torus roll and finish off the edge of a lead flat on the top of a high-pitched slated roof? Give sections.

8. Apart from increasing the durability of a cast-iron drain-ventilation-pipe by galvanising it, what advantages are gained by protecting such a pipe from rust, and what important points should be borne in mind in selecting the positions for the outlet of ventilation-pipes of soil-pipes and drains?

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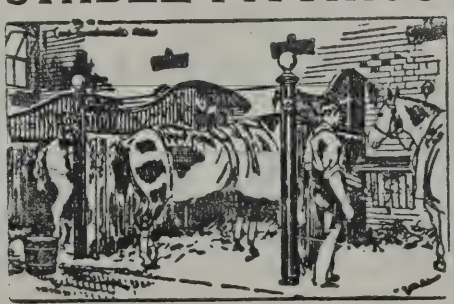
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9. Mention the important features of the best kind of wash-out closet with which you are acquainted, and describe and give sketches showing how you would connect it to a lead soil-pipe. What objections on sanitary grounds are there to the adoption of this kind of closet?

10. State the proportions of lead and tin for making (*a*) fine solder for copper-bit work, and (*b*) plumbers' solder for wiping purposes. What are the melting-points of each kind of solder and of lead and tin respectively?

11. Two valve-closets, one on the first floor and the other on the second floor of a house, each with a 4-inch round pipe-trap under it, are connected by 4-inch branches to a stack of 4-inch soil-pipe carried up full bore to the roof for ventilation. What would be the effect upon the seals of the closet-traps and the overflow-traps of the closet-basins by the discharge of pailfuls of slops through the upper closet, and if any evil arose how would you remedy it?

Honours Grade.

1. Are traps of any value for keeping noxious gases out of a house, and on what principles should they be made for valve-closets, sinks, baths and lavatories? Give rough sketches of the various traps for plumbers' work with which you are acquainted, and state their advantages and disadvantages.

2. Describe the essential features of a good valve-closet, and compare the best kind of modern valve-closet with the old Bramah closet, and state the best method of supplying a flushing-rim valve-closet.

3. In the case of a four-storeyed house, where the soil-drain runs from the back to the front, and there is no space or area outside the external walls, the whole of the site being occupied by the building, how would you disconnect the drain from the sewer, and how would you treat a rain-water pipe to be carried down the centre part of the house, and a waste-pipe from a range of three lavatory basins situated on the first floor in the centre part of the house? Give rough sketches.

4. Why does soft water act more on lead than hard water? In which case would the action of pure water on lead be more likely to render it unfit for potable purposes, when the lead cistern and its service-pipes are kept fully charged with the water, or when they are only occasionally charged? And where the water could not be drawn from the water company's main, of what material would you recommend the cisterns to be made for storing water for drinking purposes, and where should the cisterns be placed?

5. In certain cases of sewage disposal, where it would not be advisable to allow the grease from the scullery and kitchen sinks to be sent into the drains by a flushing arrangement, describe and give sketches showing how you would arrange for the interception of the grease, and state the advantages and disadvantages of intercepting grease from the house-drain.

6. Explain how cistern and other filters can become contaminated and be the cause of greater evils than those they are intended to prevent. Describe the best filter with which you are acquainted and how you would arrange for a supply of filtered water on the first floor of a house and in the butler's pantry.

7. Describe briefly and roughly sketch a lead-burning machine, and mention a few cases where it is essential that the edges of the leads or their laps should be burned instead of soldered, and describe the operation of burning.

8. What objections would you have, if any, to supply a draw-off cock with water for potable purposes from a cistern which also supplies by a separate service-pipe a valve-closet with a supply-valve and regulator attached to the closet? Would you prefer drawing drinking-water direct from the communication-pipe (rising-main) from the water company's main without constant supply or from a cistern? Give reasons.

9. There is a small stream of soft water suitable for potable purposes about a mile distant from a house which is occupied only three times a year and for about six weeks on each occasion. The stream is at a sufficient height to allow the water to gravitate from it to the house, but the supply which could be taken from it daily would be equal to about 500 gallons only, which is about half the quantity needed when the house is in full occupation; and about midway between the stream and the house there is a depression in the ground of about 20 feet, which the water-main would have to follow. How would you arrange for a proper supply of water to the house at all times during its occupation, what kind of pipe would you use for conveying the water, and what should be its size, and how would you treat the main at the depression in the ground? Give sketches.

10. It is proposed to lay a stoneware drain, about 150 feet in length, outside the external walls of a house that is occupied by about twenty persons, to receive the discharges from three stacks of waste-pipes from sinks, baths and lavatories, one stack of waste-pipe from two slop-sinks into which three stacks of soil-pipe discharge, and the rain-water and surface-water from a superficial area of about 3,000 feet. Briefly describe and

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give rough sketches showing how you would disconnect the drain from the sewer; give a transverse section through the drain, and state its size, and say how the joints should be made.

11. Two wood cisterns, each 3 feet 5 inches by 3 feet 4 inches and 3 feet deep inside, are to be lined in position with lead—that for the sides weighing 6 lbs. to the superficial foot and that for the bottom 7 lbs. to the superficial foot—and to be supplied by a ¾-inch rising-main, with a ¾-inch Croydon ball-valve, with a pressure on it of about 15 lbs. to the square inch. State the sizes and numbers of the pieces of lead necessary to line the two cisterns, and the length of sheets, 7 feet wide, you would require from which you would cut the sides and bottoms respectively. Describe how you would line the cisterns, state the total length of soldered angle in the two cisterns, and give sections of the horizontal and vertical angles, showing the soldering and the edges of the lead. Describe how you would connect the two cisterns together, and provide against an overflow of water in the case of the ball-valve getting out of order. Give rough sketches showing the relative positions of the connecting-pipe, the overflow-pipe and the ball-valve.

A NOVEL ELECTRIC LAMP.

In a recent lecture before the American Institute of Electrical Engineers, Mr. Nikola Tesla, the well-known electrician, described some experiments he has made with alternating currents, which promise in the future a new kind of electric lamp, different from those in use in that it would require no connections, and consist merely in a vacuum tube which would give a light wherever it was placed. Mr. Tesla was able to make his discoveries by inventing an alternating current dynamo producing a current having no less than a million reversals per minute. When this current was passed through the primary wire of an induction coil two fierce flames like those of a torch were seen to tip the terminals of the secondary wire. The flames were hot and brilliant, yet they were consuming no fuel, and were simply an electric discharge of the "brush" type. When a glow lamp containing a wire or a piece of carbon was held to one of the terminals it was seen to be filled with light, the wire or carbon becoming white hot, although there was no circuit for the current. Moreover, when the terminals of the secondary wire of the induction coil or transformer were connected to two large metal plates opposite each other, the space between these plates was found to be so excited by the electrostatic effect of the charges that a vacuum tube or bull, containing a slip of metal foil, placed between the plates yielded a glowing light. Mr. Tesla calls this the ideal mode of illumination, the tubes having no connections, yet yielding a soft agreeable light. A room having such plates in opposite walls would furnish a light in any part by the mere act of placing one of the vacuum tubes there.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

Applications for Patents.

12741. Samuel Barrass, for "Improvements in window-sash fasteners."

12748. Léon Covilbaud, for "Improvements in draught-excluders for doors and windows."

12762. William Scott Morton, for "Improvements in making ornamental panels or decorating material for walls, ceilings or other surfaces."

12769. John Rhodes, for "Improvements in or connected with springs and checks for the closing of doors."

12790. Thomas Bass, for "A new or improved shutter and door-fastener."

12878. Henry Audley Miller, for "Improvements in bolts."

12900. David Osborn, for "Improved apparatus for opening, closing, securing and adjusting fanlights, skylights, swing sashes and the like."

12930. Samuel Hill and Rowland Hodges, for "Improvements in and connected with door-closing springs and checks."

13059. William Barnsley Hughes and Charles Young, for "New or improved apparatus for fastening fanlights, windows and the like."

13103. Isaac John Evans, for "Improvements in lathes."

To Inventors.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. Rayner & Cassell, Patent Agents, 37 Chancery Lane, London, W.C.

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(Late GREEN & KING),
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Lower Seymour St., Portman Sq., W.
Late of 100 NEW BOND STREET).
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Friday, August 14, 1891.

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The Contract Reporter.

to The Architect.

LONDON, AUGUST 21, 1891.

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COMPETITIONS OPEN.

ABERAVON.—Sept. 10.—Designs are invited for the Proposed Port Talbot Technical and Intermediate School. Mr. M. Pennant, Town Clerk's Office, Aberavon.

BATH.—Oct. 10.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

LUTON.—Sept. 8.—Designs are invited for Alterations to Waller Street Plait Hall. Mr. E. J. Lovegrove, C.E., Town Hall, Luton.

SHREWSBURY.—Sept. 30.—Designs, &c., are invited for Building Police Station, Constable's House, &c. Mr. W. C. Eddowes, Borough Surveyor, The Square, Shrewsbury.

CONTRACTS OPEN.

ABERGAVENNY.—Aug. 31.—For Building Stone-arched Bridge. Mr. James H. Farquhar, Clerk to the Highway Board, Abergavenny.

ALDEBURGH.—Aug. 31.—For Heating Church by Hot Water. Mr. E. F. Bishopp, Architect, 22 Museum Street, Ipswich.

ALFRETON.—Aug. 29.—For Building Small Cemetery Chapel. Mr. E. Houfton, Surveyor, Local Board Offices, King Street, Alfreton.

BALLATER.—Aug. 26.—For the Works in Building a House. Messrs. Matthews & Mackenzie, Architects, 255 Union Street, Aberdeen.

BARRY ISLAND.—Aug. 27.—For Building Residences. Messrs. Richards & Gethin, Architects, Thompson Street, Barry Dock.

BEAUMARIS.—Sept. 1.—For New Buildings and Repairs on Farms, Baron Hill Estate, Mr. R. G. Thomas, Architect, Menai Bridge.

BELFAST.—Sept. 1.—For Constructing High-level Sewer. Mr. Samuel Black, Town Clerk, Belfast.

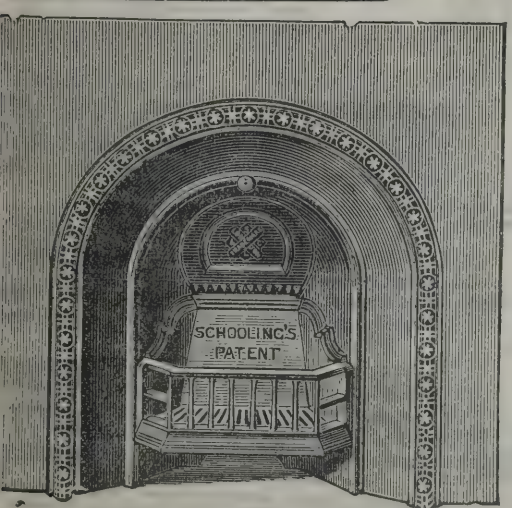
BLACKWALL.—Oct. 12.—For Constructing (by Compressed Air) and Maintaining Carriageway and Footway Tunnel under the River Thames. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

BOURN.—Aug. 24.—For Enlarging Infant School. Mr. F. G. Shilcock, Architect, Bourn.

BRADFORD.—Sept. 1.—For Heating Methodist Chapel and School. Mr. A. Barraclough, 60 School Street, Low Moor, Bradford.

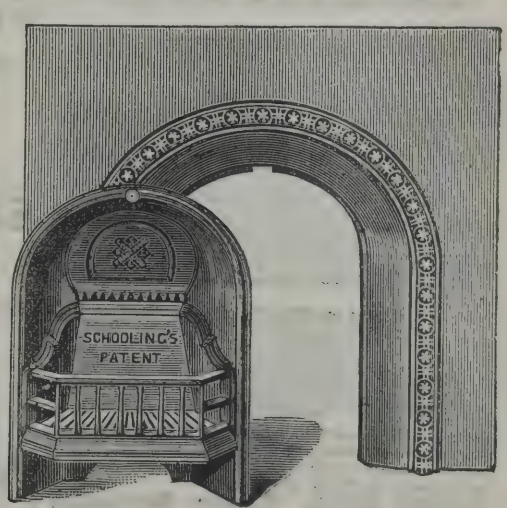
BRANDON.—Aug. 22.—For Building Seven Houses and a Four-stalled Stable with Outbuildings, &c. Mr. James Lindsay, Architect, 9 Cockton Hill Terrace, Bishop Auckland.

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BRIDGEND.—Aug. 31.—For Building Parsonage, Kenfig Hill. Messrs. Halliday & Anderson, Architects, 16 High Street, Cardiff.

BRYMBO.—Aug. 22.—For Additions to Bwlchgwyn. Mr. R. J. Kendrick, 1 Henblas Street, Wrexham.

BURTON-ON-TRENT.—Aug. 29.—For Construction of Cast-iron Tank. Mr. F. L. Ramsden, Gas-Engineer, Gasworks, Burton-on-Trent.

CAERPHILLY.—Aug. 24.—For Building Ten Cottages. Messrs. Phillips & Holdgate, St. John's Chambers, Cardiff.

CARLISLE.—For Supply of Wrought-iron Railing. Mr. Charles J. Ferguson, Architect, Carlisle.

COVENTRY.—Aug. 21.—For Building Villa. Mr. Herbert W. Chattaway, Architect, Trinity Churchyard, Coventry.

CUCKFIELD.—Sept. 3.—For Constructing Sewers. Mr. James Mansergh, Engineer, 5 Victoria Street, Westminster.

DENBIGH.—Aug. 31.—For Building Chancel and Alterations to St. David's Church. Mr. R. Lloyd Williams, Architect, Park Lane, Denbigh.

DORCHESTER.—Aug. 24.—For Tar Paving. Mr. G. Symonds, Town Clerk's Office, Dorchester.

DORKING.—Aug. 27.—For Constructing Sewers. Mr. W. Rapley, jun., Wather Road, Dorking.

DURHAM.—Aug. 22.—For Building Boathouse. Mr. C. Hodgson Fowler, Architect, The College, Durham.

EARL'S BARTON.—Aug. 24.—For Construction of Water-Supply Works, Supply of Machinery, Pipes, &c. Mr. E. Sharman, Engineer, Wellingborough.

EDINBURGH.—For Taking Down Hospital for Sick Children preparatory to Building New Hospital. Mr. G. Washington Browne, Architect, 5 Queen Square, Edinburgh.

EDMONTON.—Aug. 25.—For Supply and Delivery of Steel Joists and Girders. Mr. G. Eedes Eachus, Town Hall, Lower Edmonton.

ELLENBOROUGH.—Aug. 25.—For Building Two Dwelling-houses. Mr. James Smith, Albert Terrace, Netherton, Maryport.

GALLOWAY.—Aug. 28.—For Building Houses. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

GREAT YARMOUTH.—Aug. 21.—For Building House. Mr. S. Rivett, Architect, 5 South Quay, Great Yarmouth.

HAMPSTEAD HEATH.—Sept. 29.—For Erecting Public Conveniences. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

HANWELL.—Aug. 24.—For Laying Sewer, Fixing Ventilators, &c. Mr. E. J. W. Herbert, Local Board Offices, High Street, Hanwell, W.

HAYWARD'S HEATH.—Aug. 28.—For Additions to Ward at County Lunatic Asylum. Mr. Henry Card County Surveyor, Lewes.

HORNSEY.—Sept. 12.—For Building Public Baths and Washhouses. Mr. A. Hessell Tiltman, Architect, 70 Torrington Square, W.C.

HORNSEY.—Aug. 24.—For Constructing Brick Culvert, with Manholes, Ventilators, &c. Mr. T. de Courcey Meade, Local Board Offices, Southwood Lane, Highgate, N.

ISLINGTON.—Sept. 12.—For Building Public Baths and Washhouses. Mr. A. H. Tiltman, Architect, 70 Torrington Square, W.C.

KENSINGTON.—Aug. 27.—For Enlarging Workshops at the Workhouse. Mr. T. W. Aldwinckle, Architect, 2 East India Avenue, E.C.

KINGSTON-UPON-THAMES.—Aug. 25.—For Supply of Chalk or Pit Flints. Mr. Harold A. Winser, 90 Eden Street, Kingston-upon-Thames.

LEOMINSTER.—Aug. 21.—For Building Free Library. Mr. F. R. Kempson, Architect, Bromyard.

LEWES.—Aug. 22.—For Supply of Broken Granite. Mr. Arthur Holt, Town Hall, Lewes.

LEWISHAM.—Aug. 27.—For Painting and Repairs. Mr. H. C. Mott, Union Offices, High Street, Lewisham, S.E.

LLANTRISANT.—Aug. 25.—For Additions, &c., to Board Schools. Mr. W. John, Clerk to the School Board, Brynteg, Llantrisant.

LONDON.—For Building Portland Stone Front. Mr. W. H. Duffield, 2 King Street, E.C.

MALPAS.—Aug. 26.—For Laying on Water Supply. Mr. John Anstie, 17 Victoria Street, Westminster.

MORLEY.—Aug. 26.—For Building Town Hall, Municipal Offices, Police Courts and Offices. Messrs. Holtom & Fox, Architects, Dewsbury.

NORTH-EASTERN RAILWAY.—Sept. 2.—For Building Sixty-eight Dwelling-houses in Flats, Two Storeys High, and Works in Connection, Felling-on-Tyne. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

NORWICH.—Aug. 22.—For Supply of Wood-Paving. Mr. P. P. Marshall, C.E., City Engineer, Norwich.

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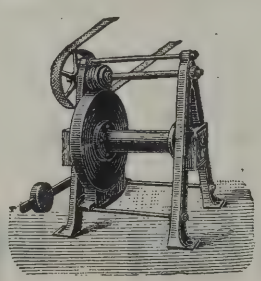
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NORWICH.—Aug. 31.—For Repairs to County Bridge, Stoke Mill. Mr. T. H. B. Heslop, County Surveyor, Norwich.

OLD BASFORD.—For Building Methodist New Connection Schools. Messrs. Marshall & Turner, Architects, Cauldron Place, Long Row, Nottingham.

PLYMOUTH.—Sept. 1.—For Building Stores, Stable and Cartshed. Mr. John Watts, Secretary to the Cemetery Company, Plymouth.

PONSHONORTON.—Aug. 28.—For Building School. Mr. T. Rowland, Architect, Market Buildings, Pontypridd.

PONTYPOOL.—Aug. 24.—For Building Infants' School, Master's House and Additions to Board School. Mr. E. A. Lansdowne, Architect, High Street, Newport, Mon.

PRESTWICH.—Aug. 25.—For Additions to St. Margaret's Schools. Mr. Percy D. Lodge, Architect, 49 Princess Street, Manchester.

READING.—Sept. 2.—For Machinery and Fittings for Sewage Pumping Station. The Borough Engineer, Town Hall, Reading.

RINGWOOD.—Aug. 31.—For Boundary Walls and Enlarging Cemetery. Mr. George P. Brown, Clerk to the Burial Board, Ringwood.

SKENE.—Aug. 24.—For the Works in Building Proctor's Orphan Home. Messrs. Jenkins & Marr, Architects, 16 Bridge Street, Aberdeen.

SUNDERLAND.—Aug. 21.—For Altering Insane Wards at Workhouse. Messrs. J. & T. Tillman, Architects, 5 Bridge Street, Sunderland.

SUNDERLAND.—Aug. 31.—For Building Junior School and Laboratory. Mr. T. W. Bryers, Clerk to the School Board, 15 John Street, Sunderland.

SUTTON.—Sept. 7.—For Constructing Sewers. Mr. John Anstie, 17 Victoria Street, S.W.

SUTTON-IN-ASHFIELD.—Aug. 29.—For Building Three Shops and Alterations to Premises. Mr. J. P. Adlington, Architect, High Pavement, Sutton-in-Ashfield.

TOTNES.—Aug. 28.—For Works at St. John's Church, Bridgetown. Mr. W. M. Tollit, Architect, 10 High Street, Totnes.

TUAM.—Sept. 2.—For Building Wing to Workhouse. Mr. J. Harris, C.E., Galway.

WALTHAMSTOW.—Aug. 28.—For Supply of Broken Granite. Mr. Gilbert Houghton, Town Hall, Walthamstow.

WAVERTREE.—Aug. 25.—For Providing and Fixing Cast-iron Standards and Wrought-iron Rail Fencing. Mr. Isaac Dixon, Town Hall, Wavertree.

WIBSEY.—Aug. 27.—For Building Four Houses. Messrs. Brayshaw & Dixon, Bowling Old Lane, Bradford.

WIGAN.—Sept. 1.—For Building Church. Mr. W. Wright, Surveyor, Lancaster.

WITHAM.—Aug. 31.—For Building Schoolrooms, Extension of Laundry, &c., at South Metropolitan School. Mr. Henry Burgess, Brighton Road, Sutton, Surrey.

YORK.—Aug. 31.—For Supply of Granite and Whinstone Setts. Mr. Alfred Creer, City Surveyor, Guildhall, York.

YSTRADYFODWG.—Aug. 27.—For Constructing Sewers. Mr. Walter H. Morgan, Local Board Offices, Pentre-Rhondda, near Pontypridd.

TENDERS.

ALNWICK.

For Rebuilding the Star Hotel, Alnwick, for Mr. G. S. Smart. Mr. G. REAVELL, jun., Architect, Alnwick.

M. Armstrong, Alnwick	£1,850 0 0
R. Carse & Son, Amble *	1,630 10 0

* Exclusive of lifts, revolving shutters and fireplaces.

For Additions to Workhouse, Alnwick.

W. Darling	£288 5 0

BRADFORD.

For Erection of Hospital Buildings, Boundary Walls, &c., in Connection with the Thornton Joint Hospital. Messrs. W. & J. B. BAILEY, Architects, 9 Market Street, Bradford.

Accepted Tenders.

Balmforth & Reese, Bradford, masons.
S. Benn, Queensbury, joiner.
T. Nelson, Bradford, slater.
T. W. Higginbotham, Bradford, plumber.
Varley & Roebuck, Thornton, painters.
T. Laycock & Son, Stanningley, plasterers.

For Building Wesleyan Chapel, St. Anne's-on-the-Sea. Messrs. WALKER & COLLINSON, Architects, 26 Kirkgate, Bradford.

W. JOHNSON, Bradford (*accepted*).

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C. Gee, Great Shelford	7,075 11 4
W. Bell & Sons, Cambridge	7,063 0 0
W. Saint, Cambridge	7,058 0 0
Ripper Bros., Cambridge	7,000 0 0
C. Kidman, Cambridge	6,987 0 0
Kerridge & Shaw, Cambridge	6,955 0 0
Willmott & Sons, Cambridge	6,600 0 0
Coulson & Lofts, Cambridge	6,575 0 0
P. Banyard, Cambridge	6,222 0 0
F. THODAY & SON, Cambridge (*accepted*)	6,188 0 0

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For Reconstruction of Sewers and Carriageways, Bute Town, Cardiff. Mr. W. HARPUR, Borough Surveyor. Quantities by Engineer.

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J. ALLAN, Cardiff (*accepted*)	6,356 0 3
T. Rees, jun., Cardiff	6,189 7 8

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W. Davies	288 12 5
R. C. DALY & CO. (*accepted*)	287 4 1

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For Alterations and Additions to the Rolling Mill Tavern, Western Road, Jarrow, for Mr. M. Wood, South Shields. Mr. H. GRIEVES, A.R.I.B.A., Architect, Albany Chambers, South Shields.

S. Sheriff, South Shields	£632 5 1
T. Lumsden, Jarrow	629 0 0
STORAR & SON, Jarrow (*accepted*)	615 14 0

KILLINCHY.

For Alterations and Repairs to Killinchy Parish Church.

J. MCKNIGHT, Killyleagh (*accepted*)	£204 0 0
Murray Bros., Comber	190 0 0
W. McMillan, Ballyalton	187 0 0
A. McRoberts, Saintfield	187 0 0

KEITH.

For Additions to the Junior Department, Keith Public School, for the School Board. Mr. F. D. ROBERTSON, Architect, Fife-Keith.

Accepted Tenders.

W. Cruickshank, mason	£327 10 0
G. & R. Cameron, carpenter	248 0 0
A. & R. Wright, slater	74 0 0
J. Armand, plumber	47 0 0
G. McKay, plasterer	46 0 0
R. Tindal, heating	27 0 0
C. Anderson, Reid, painter	10 0 0

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For Works to Hunt's Road, Stirchley Street, King's Norton. Mr. ROBERT GODFREY, Surveyor, 23 Valentine Road, King's Heath.

Sidwell Bros., Birmingham	£578 0 0
Jones & Fitzmaurice, Birmingham	462 0 0
CURRALL & LEWIS, Birmingham (*accepted*)	409 0 0

LINCOLN.

For Erection of St. Hugh Church, R.C., for the Very Rev. Canon Croft. Mr. ALBERT VICARS, Architect, Somerset Chambers, 151 Strand.

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Adams, Herne Bay	£10,218 0 0	£50 0 0
Halliday, Stamford	8,937 0 0	45 0 0
Dove, London	8,745 0 0	—
Goddard, Farnham	8,230 0 0	40 0 0
Pattinson, Sleaford	7,857 0 0	50 0 0
Shillitoe, Bury St. Edmunds	7,693 0 0	50 0 0
Calvert, Lincoln	7,625 0 0	—
Wright, Lincoln	7,436 0 0	20 0 0
Close, Lincoln	7,348 0 0	38 0 0

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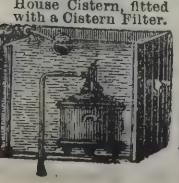
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For Improvement Works, Holloway Road and Highgate Hill, Upper Holloway. Mr. J. PATTEN BARBER, Chief Surveyor to Vestry of St. Mary, Islington.

G. G. Rutty, Bromley-by-Bow	£7,659 10 10
Turner, Son & Evanson, Chelsea	6,279 10 0
Mowlem & Co., Westminster	6,230 2 6
Nowell & Robson, Kensington	6,130 15 3
W. GRIFFITHS, Kingsland (*accepted*)	—

For Alteration, Ventilation, Painting and Decorating Vestry Hall and Offices, Construction of Strong Rooms, Islington. Mr. J. PATTEN BARBER, Chief Surveyor.

Holliday & Greenwood	£1,475 0 0
R. Eddie	1,398 0 0
Macfarlane Bros.	1,336 0 0
STEVENS BROS. (*accepted*)	1,294 0 0

For Works at Coroner's Court and Mortuary Buildings at Holloway Road, Islington. Mr. J. PATTEN BARBER, Chief Surveyor.

R. Metcalfe	£410 0 0
C. M. Prout	218 0 0
J. Webb	215 0 0
W. E. Jacques	198 0 0
STEVENS BROS. (*accepted*)	193 15 0

For Building Premises No. 1 Denmark Hill, for Mr. E. Jones. Mr. J. C. REYNOLDS, Architect.

Whitehead	£1,455 0 0
W. Shurmur	1,323 0 0
J. & H. Cocks	1,320 0 0
G. Parker	1,298 0 0
G. Ford	1,248 0 0

For Repairs to the Licensed Victuallers' Asylum, Asylum Road, Old Kent Road, preparatory to the election of new inmates in November. Mr. F. POTTER, Architect.

W. WYTHE, Dalston (*accepted*).

LONDON—*continued.*

For Rebuilding 11 Seven Sisters Road. Messrs. POOLEY & FOLLETT, Architects, 21 John Street, Adelphi. Quantities supplied.

F. G. Davis, Theobald's Road	£1,900 0 0
Simmonds Bros., Chelsea	1,864 0 0
R. D. Lown & Sons, Holloway	1,670 0 0
R. Hill, Tottenham	1,657 0 0
Gould & Brand, Camden Town	1,589 0 0
J. W. MELLER, Willes Road (*accepted*)	1,566 0 0

For Alterations and Additions to Lancaster House, Dacres Road, Forest Hill. Mr. J. RANDALL VINING, Architect and Surveyor, 89 Chancery Lane. Quantities supplied.

T. Watson	£1,180 0 0
W. Johnson & Co., Limited	1,130 0 0
A. Black & Son	1,097 0 0
J. & C. Bowyer	1,085 0 0

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Veres	£2,999 0 0
Treasure & Son	2,957 0 0
E. Toms	2,846 0 0
Mattocks Bros.	2,733 0 0
J. Steed	2,695 0 0
W. Shurmur	2,655 0 0
J. Jarvis & Son	2,545 0 0

For Rebuilding the Princess Royal, Cable Street, E. Mr. C. A. LEGG, Architect.

W. Ayres	£2,695 0 0
S. Salt	2,477 0 0
F. & F. J. Wood	2,439 0 0
W. Shurmur	2,394 0 0
Hearle & Farrow	2,371 0 0
W. J. Maddison	2,310 0 0
Calnan & Co.	2,208 0 0
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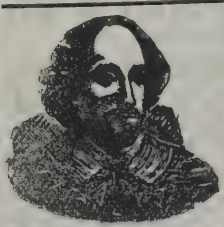


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W. Johnson & Co., Limited	855 0 0
R. G. Battley	825 0 0
G. Davenport	819 0 0
W. & H. Castle	795 0 0
J. & C. Bowyer	794 0 0
W. G. MASTERS (*accepted*)	787 0 0

For Converting Nos. 66 and 68 Barking Road into Shops, for Mr. J. H. Pavitt. Mr. A. J. DALE, Architect, Barking Road, Plaistow.

J. G. HORLOCK (*accepted*)	£917 0 0

NEWPORT.

For Building Church at Barnard Town, Newport, Mon. Messrs. WILLIAM GRAHAM, SON & HITCHCOX, Architects, Victoria Chambers, Newport, Mon. Quantities by Architects.

H. Welsh, Hereford	£4,500 0 0
Morgan & Roberts, Newport	3,300 0 0
Stephens & Bastow, Bristol	3,299 0 0
W. A. Linton, Newport	3,170 0 0
G. Wilkins, Newport	3,160 0 0
C. Lock, Newport	2,925 0 0

PONTYPOOL.

For Building Police Superintendent's House, Pontypool, and Police Buildings, New Tredegar. Mr. WILLIAM TANNER, F.S.I., County Surveyor, Architect. Quantities by Architect.

Superintendent's House, Pontypool.

T. G. Diamond, Newport	£985 0 0
John Linton, Newport	950 0 0
Moulton & Brownscombe, Newport	923 0 0
Morgan & Evans, Pontypool	902 0 0
JOHN BURGOYNE & SON, Pontypool (*accepted*)	850 0 0

Police Buildings, New Tredegar.

Osborn & Co., Aberdare	£1,671 0 0
John Linton, Newport	1,630 0 0
T. G. Diamond, Newport	1,538 0 0
MOULTON & BROWNSCOMBE, Newport (*accepted*)	1,429 0 0

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For Erection of proposed Teachers' Residence for the Paignton School Board. Mr. GEO. SOUDON BRIDGMAN, V.P.S.A., Architect. Quantities supplied.

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G. Webber	471 0 0
E. Westlake	449 10 0
F. Vanstone	449 0 0
C. & R. E. Drew	449 0 0
Rabbick & Brown	412 0 0

RICHMOND.

For Erection of Municipal Buildings, Richmond, Surrey. Mr. W. J. ANCELL, Architect, 3 Staple Inn, E.C.

B. E. Nightingale, Albert Embankment	£14,115 0 0
Reed, Blight & Co., Plymouth	13,916 0 0
Lawrence & Son, City Road	13,601 0 0
A. Kellett, Willesden	13,360 0 0
Wheatley & Sons, East Molesey	13,208 0 0
Stephens, Bastow & Co., Bristol	12,999 0 0
J. H. Jarvis, Surbiton	12,959 0 0
F. & H. F. Higgs, Loughborough Junction	12,900 0 0
LANSDOWN & Co., Richmond (*accepted*)	12,887 0 0
W. Wallis, Balham	12,786 0 0
Allen & Sons, Kilburn	12,634 0 0
Collinson, Teddington	12,550 0 0

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For Building Private Dwelling-house for Mr. F. R. Roberts. Mr. J. KINGWELL COLE, Architect. Quantities by Mr. Edward J. Mansergh, 28 Mount Street, Grosvenor Square, W.

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Morter	2,690 0 0
Dove Bros.	2,675 0 0
Nightingale & Co.	2,515 0 0
Chafen	2,513 0 0
T. Osborn	2,495 0 0
Wells	2,495 0 0
Hack	2,398 0 0
Faulkner	2,395 0 0
HARRIS & WARDROP (*accepted*)	2,380 0 0

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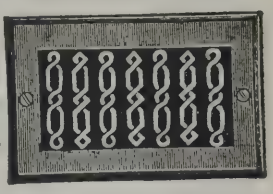
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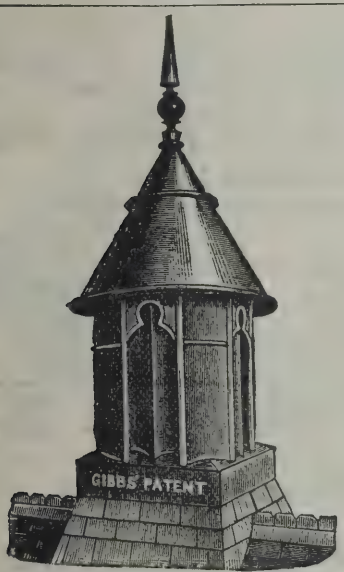
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GIBBS' IMPROVED VERTICAL INLET.



No. 7 (Inlet). ORNAMENTAL BRACKET PATTERN.



No. 3 (Registered Design). GIBBS' PATENT WEATHERPROOF EXTRACTOR.

No. 16. (Registered Design.)



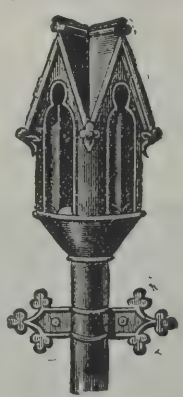
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No. 4 (Circular Front). STRONG GALVANISED BOARD SCHOOL PATTERN.

GOTHIC.
SOIL PIPE PATTERN.



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PRICE ON APPLICATION.

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Extractor, 12 in. dia.			.....	4½ to 6 in. pipe..	£1	11	6	Extractor, 20 in. dia.			.....	8 to 10 in. pipe..	£3	17	0	Extractor, 36 in. dia.			.....	14 to 18 in. pipe..	£9	15	0
,,	14	,,	.....	5 to 7 ,, ..	1	17	6	,,	24	,,	.....	9 to 12 ,, ..	5	5	0	,,	42	,,	.....	16 to 20 ,, ..	11	17	6
,,	16	,,	.....	6 to 8 ,, ..	2	12	6	,,	27	,,	.....	12 to 14 ,, ..	6	7	6	,,	48	,,	.....	18 to 24 ,, ..	16	15	0
,,	18	,,	.....	7 to 9 ,, ..	3	5	0	,,	30	,,	.....	13 to 15 ,, ..	7	10	0	,,	54	,,	.....	20 to 27 ,, ..	19	0	0

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JOHN WILLIAMS, Trefyncuel, near Ruabon (*accepted*) £1,093 0 0

SEDDING MEMORIAL VOLUMES.

THE list of subscribers to this work is now nearly full, and it is intended to raise the price of the volume immediately after publication. Besides ten large photos of Mr. Sedding's buildings (negatives 15 by 12), there will be five plates of facsimile reproductions of his sketches, five plates of sketches of his buildings, and ten plates of his designs for embroidered frontals, stalls, hangings, borders, &c., wall-papers, memorial brasses, wrought ironwork, candlesticks, crosses, staffs, &c. Subscription forms may be obtained of Messrs. Batsford & Son, Holborn.

NOTES ON NOVELTIES.

Ventilators.—The "Climax" Ventilating Company write to us :—"In your last issue, under the heading 'Ventilators,' you kindly referred to certain ventilating works we are carrying out at home and abroad, but, in so doing, you referred to Mr. Arthur W. Stephenson as being the engineer to this company, whereas he is the engineer for the erection of the cotton and jute mills referred to. We shall be glad if you will make the necessary correction and oblige." The company also inform us that they have received the following testimonial from a well-known architect :—"Having used your ventilators, I have pleasure in testifying to their thorough efficiency. I have had experience of many others, but am convinced that your direct-acting ventilators are the best in the market, and will continually specify them in my work."

[The misconception, viz. that we referred to Mr. Stephenson as engineer of the "Climax" Ventilating Company, has not unnaturally arisen from the accidental omission of "by" after "Mr. Arthur W. Stephenson."]

BUILDING AND BUILDERS.

MR. WALTER SCOTT, contractor, of Newcastle, who is a native of Abbey Holme, has placed in the east chancel window of Holme Cultram Abbey Church a stained-glass window in memory of his wife, his parents and other members of his family.

THE Plans Committee of Aberdeen Town Council have sanctioned the plans of extensive additions to Union Works, Poynernook, the Aberdeen premises of Messrs. A. Pirie & Sons, Limited, paper manufacturers. It is proposed to erect two large fireproof buildings, and to heighten one of the existing buildings, and the cost of the extensions is estimated at 25,000*l*. Messrs. Jenkins & Marr are the architects. Messrs. James Bannochie & Sons, Belmont Street, have received the contract for laying the concrete foundations of the additions.

THE *Carlisle Journal*, in announcing the death of Mr. Thomas Milburn, aged sixty-seven, says he was formerly and for many years a builder in Carlisle. By his energy and untiring industry he made for himself a competence, and retired from business a few years ago. He was a member of the Town Council for Botchergate Ward for several years, and in 1878-9 filled the office of mayor to the satisfaction of the citizens. He was subsequently appointed a magistrate of the city. As an active member of the Health Committee and the Town Improvement Committee he did the city much good service, and the public often reaped the benefit of his practical knowledge of the building trade.

THE School Buildings Committee of the Aberdeen School Board have sanctioned an addition to St. Paul Street Public School.

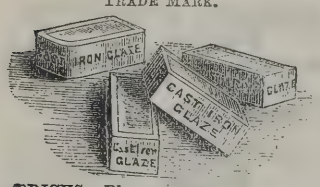
THE Jarrow Town Council have decided to erect a suitable building for technical education at a cost of 3,000*l*., provided the Durham County Council agree to pay the Corporation 1,000*l*. out of this year's grant.

THE new chapel, erected at Longshawe for the Duke of Rutland from the plans of the Duke's architect, Mr. King, has just been opened.

THE work of building the Price Memorial Hall in Brunswick Road, Gloucester, has begun. Mr. William Jones, of Gloucester, is the builder.

TWO reports from Mr. Lockwood, architect, of Chester, on the scheme for the erection of the Oswestry Municipal Build-

TRADE MARK.



BRICKS.—Please specify "Cast-Iron Glaze." L.E.W.



Brickyards and Tile Works, Fenton and Longton, Stoke-on-Trent. *Established 1847.*

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GLAZED BRICKS:

CLAY—Non-absorbent and Ferruginous. GLAZE—Hard and almost Indestructible.

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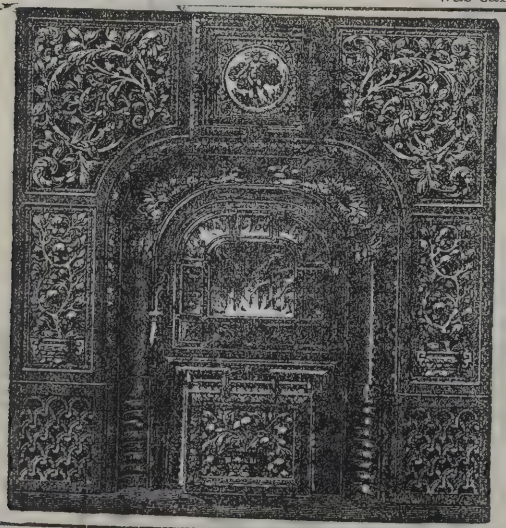
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ings, the selected architect for which is Mr. H. Cheers, of Twickenham, were read at the meeting of the Town Council. The following motion was then agreed to :—"That the Council be recommended to carry out the competition plans with the exception of the alteration required by the Local Government Board and the slight alterations suggested by the Free Libraries Committee and accepted by the Council, and that the raising of the building be abandoned owing to the extra cost, it being understood that no extra charge be made by Mr. Cheers for the preparation of the extra plans and quantities thus necessitated." It was further decided that parties who sent in tenders should be invited to send in fresh tenders upon the revised plans and quantities. A reduction of 1,000*l.*, it is estimated, will be thus effected.

TRADE NOTES.

THE additions to St. Mary's Catholic Schools, Widnes, are being warmed and ventilated by means of Shorland's patent Manchester grates, which have proved satisfactory in the old schools, the same being supplied by Mr. E. H. Shorland, of Manchester.

AFTER considerable negotiations with various property owners, the Kegworth Parochial Committee have finally decided to enter into a provisional agreement to purchase 8 acres of land from Mr. Sidney Wells for sewage disposal purposes. Mr. W. H. Radford, C.E., of Nottingham, has prepared a scheme for the sewerage and sewage disposal, and this scheme has been passed by the Committee and by the Shardlow Guardians. It is proposed to lay down new pipe sewers in most of the streets, and special joints will be used where water is met with. There will be a short length of tunnel through the hill past the church. The sewage will all be delivered by gravitation to the sewage disposal site, where the outfall will be 12 feet below ground level. The sewage at the outfall will be pumped into the sewage carriers by means of a gas-engine and centrifugal pump. There will be a tank under the engine-house for night storage, of such a capacity that it will only be necessary to work the pump for about three hours daily. As there is no suitable outlet for deep land drains and the soil is somewhat porous, the sewage would find its way too readily to the drains if arranged in the ordinary way; it is therefore proposed to keep down the subsoil water by merely surrounding each field with a large land drain protected by a bank. The sewage will be purified on the land by irrigation, and the soil is very suitable. Application has been made to the Local Government Board for sanction to borrow 5,000*l.*

THE premises of Messrs. J. Wilson & Sons, timber merchants, Bradford, have been almost completely destroyed by fire. The damage is estimated at 20,000*l.*

THE town of Larne has been illuminated with electric light for the first time. This is the first town in the North of Ireland which has adopted electricity for illumination.

THE Company of Armourers and Braziers will hold, in London, their third exhibition in May, 1892. The exhibits will mainly consist of objects executed in metal from original designs. Particulars as to the prizes offered and conditions of exhibition will shortly be obtainable from the clerk to the company.

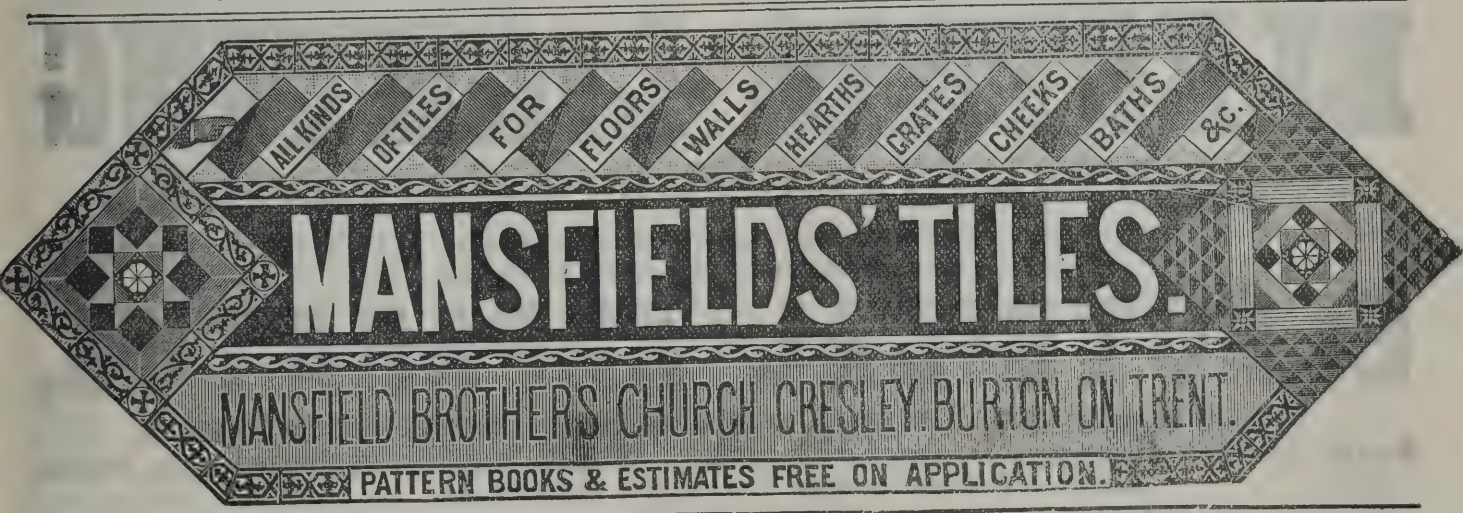
AN order has been given by Messrs. A. Pirie & Sons, Limited, Aberdeen, for six steel Lancashire boilers to Messrs. James Abernethy & Co., Ferryhill. The boilers are to be of the most approved type, with corrugated furnaces, with welled flues, and are to work at 200 lb. per square inch pressure.

PLANS are being prepared for the construction of a new landing stage at Lambhay, for the Plymouth County Council.

THE tenders received for the proposed police station at Bury St. Edmunds have exceeded by a large sum the county surveyor's estimate. The plans, in consequence, will be modified.

A RECOMMENDATION before the Rhyl Commissioners that notice to purchase the gasworks should be given forthwith to the gas company, and application made to the Local Government Board for sanction to a loan of 38,000*l.* for the purchase, has been deferred till October for consideration.

THE award in the case of Newell, contractor, and the Liverpool Corporation has been made by Sir John Coode. He awards to Mr. John Newell, the plaintiff, in respect of his claim the sum of 14,423*l.* 10*s.*, and has given judgment for the plaintiff on the defendants' counterclaim. He has directed that each party shall pay his own costs of the reference and half the arbitrator's charges and costs of the award, which latter amount to 958*l.* As by the order of reference the costs of the action were to follow the event, the plaintiff takes the general costs of the action. The defendants' counterclaim was for penalties alleged to be due under the contract, and for the cost of the



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completion of the tunnel by Messrs. Cochrane & Sons, which cost the Corporation will now have to pay. The contractor claimed altogether 28,474*l.*, comprising 16,949*l.* for work actually done in the tunnel, 11,000*l.* for loss of profits, and 525*l.* for detention of plant. On the other hand, the Corporation made a counter-claim of 9,600*l.* for non-fulfilment of the contract.

THE iron bridge which the Leamington Corporation have erected in the Adelaide Road, at a cost of 2,000*l.*, has been officially opened. The new bridge has an arch span of 70 feet 5½ inches, and rests upon seven wrought-iron arch ribs. The height of the arch is 11 feet 8 inches from the spring.

A WATER-FOUNTAIN and trough is about to be presented by Messrs. W. Tuffill, of Rochester, to the city, as a memorial of their late brother, Mr. W. Tuffill. It will take the place of the ancient pump in Eastgate, and will be in Aberdeen granite.

AT a meeting of the Finance Committee of the Court-house Buildings Commissioners, to consider the question of the ventilation of the Sheriff Court-house Buildings, Aberdeen, it was agreed to remit to Mr. Kelly (Smith & Kelly) to report on a scheme of ventilation for the Court-house, the County Hall, and the Joint Town and County Hall.

THERE is a difference of opinion as to the sanitary state of the drains in the township of Stanwix and Etterby. At a vestry meeting of ratepayers the following resolution was adopted :—That a committee of six ratepayers be appointed to inspect the sewers and drains in the township of Stanwix and Etterby (with power to call to their aid a sanitary engineer if requisite) and to report to a future meeting.

THE Works Committee of the Aberdeen Harbour Board have agreed to extend the fish market wharf from the present termination to the graving dock, a distance altogether of 480 feet, at a cost of about 3,400*l.* It was first proposed to extend the wharf only 300 feet.

IT was reported at the last meeting of the Mersey Docks and Harbour Board, by the Marine Committee, that the 10,000*l.* authorised to be spent in dredging experiments on the bar at the mouth of the river was now expended, and that the Mersey Conservancy Commissioners had sanctioned the expenditure of a further sum of 6,000*l.* Mr. Crow, chairman of the committee, stated that up to the end of last month 420,000 tons of sand had been removed, the result being that whilst before the operations there was a depth of only 11½ feet at low water at some parts of the bar, a survey taken a fortnight ago indicated a depth of 16 feet over four-fifths of the distance across the bar on the eastern side, and a minimum of 13 feet on the western side.

AT the half-yearly meeting of the Great Western Railway Company, the chairman, in the course of his remarks alluding to the construction of bridges, said the Great Western was remarkably well off in that matter. Their old friend Brunel did not like cast-iron at all, and he put up some most beautiful wooden contrivances. All the cast-iron bridges on the line were carefully looked after and tested at the proper times, and the directors could not do more than go on replacing them as they had done for years past. There was nothing to be apprehended either in cost to the company or in the safety of the passengers from the cast-iron structures which existed upon the railway.

VARIETIES.

THE *Scotsman* says :—It is understood that the consulting engineers, Messrs. Gale, Hill & Mansergh, have recommended the Manor district as that to which the Edinburgh Water Trustees should look, in all the circumstances, as a new source of water supply. The report has not yet been printed, but it is further stated that in connection with the question of the cost of the scheme the engineers have very considerably increased the estimate of 664,000*l.* for 15,000,000 gallons per day from the Manor, which was given by Messrs. Leslie & Reid in 1890. It is suggested that the scheme should be proceeded with in two instalments. Under the first half the supply would be increased by 10,000,000 gallons, and under the second half by an additional 5,000,000 gallons.

THE Bootle Town Council require Mr. Blair, their surveyor, to reside in the borough instead of at Formby, where he has taken a house for twelve months, otherwise he will be called on to resign.

THE forest fires at Var, which have been at last extinguished, have destroyed 30,000 hectares of pine and oak trees.

THE new reservoir at Laurencekirk was completely wrecked on Saturday while some supports were being taken out. Mr. Scott, one of the contractors (Scott & Sellar, Aberdeen), had a narrow escape of his life. While employed in taking out the wooden centres supporting the roof, the whole collapsed, the sides bulging out and the roof falling in.

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Isolated Plants for Lighting Country Mansions, Houses, Shops, Offices, &c. Estimates Free.
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The "Diamond" Quick-Break SWITCHES. Largest Sale in the World. Best Make throughout.
The "Diamond" Single-Coil ELECTRIC BELL. Price only 3s. each.
WOODHOUSE AND RAWSON
UNITED, LIMITED,
ELECTRICAL AND GENERAL ENGINEERS,
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It is reported by Mr. R. C. Reid, C.E., Edinburgh, that the South Harbour Street wall, Ayr, has failed through its own inherent weakness, and from the fact that the foundation has been rendered insecure by the scouring action of the river, and, further, that this scouring action is in a great measure due to the artificial deepening of Ayr harbour. Mr. Reid recommends a new wall, to be founded on the shale or blaise under the clay, about 5 feet below low water. The cost would be 1,200*l.*

REMEDY AGAINST DAMP WALLS.

The Silicate-Zopissa Composition is manufactured by the Granitic Paint Company, of 84 Lombard Street, E.C. It is a washable distemper, and specially intended for damp walls, having the property of rendering walls and other surfaces to which it is applied proof against damp, and also contributing to their durability. Drying rapidly, hard and "flat," it produces a surface of great beauty. While rendering walls impervious to damp, it tends to retard decay in porous stone, bricks and tiles. For interior use it has the great advantage of not being liable to be rubbed off, and thus takes the place of whitewash or ordinary distemper colouring where formerly used. From a sanitary point of view, it is valuable for use in hospitals and all public and other buildings where there is likely to be risk of contagion. The application of the composition involves little trouble, but the instructions of the company as supplied by them should be strictly followed. If this is done (and the mechanical parts of the instructions are simply that the surface having been cleaned by brushing, &c., the composition is to be laid on with a painter's brush), it is claimed that the result cannot fail to be satisfactory.

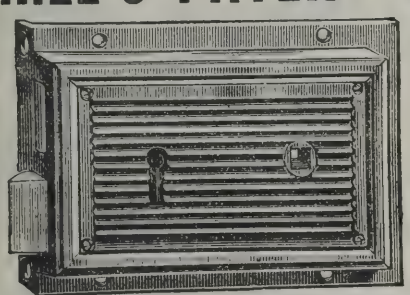
The granitic paint is another specialty of this company. The jury of the International Health Exhibition awarded a silver medal to the company for their exhibits of these goods. Like the zopissa composition it may be used either in or out of doors. It is suited for every style or kind of painting, and may be employed with success in producing decorative effects, or simply as a preservative for coarse and rough materials. Its other advantages are very numerous. Heat, moisture, frost or sea-air have no injurious effect upon it; it is, therefore, well suited to either tropical or cold climates, and is not liable to blister. It dries very hard, and at the same time possesses great fineness, durability and covering properties. These latter qualities make it a serviceable paint for all purposes required by architects, engineers, contractors, &c. As a preservative it is trustworthy in protecting wood and iron and such materials from rust and decay, and will make joints in ironwork fully equal to red lead. It is economical in use, as on iron and many other substances one coat is found sufficient and two coats give results quite equal to three of ordinary paint. It is ground in oil and supplied ready for immediate use. The company keep fifteen different colours and tints in stock, and any other can be made to order at rates cheaper than those for ordinary lead paint. As to the covering properties of this paint in the lighter colours, 1 cwt. of granitic paint will cover from 600 to 650 square yards of wood with one coat; and a similar quantity of one of the darker colours will cover from 800 to 1,500 square yards of wood. On iron or stone the covering properties of this paint are greatly increased.

CONTINENTAL TECHNICAL SCHOOLS.

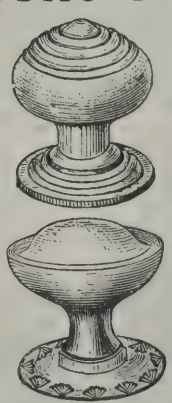
Within the last month a deputation from the Manchester Technical Schools visited several of the Continental and English institutions of a similar character. An exhaustive and interesting report is now presented, including plans explanatory of some of the buildings. It is believed that the view presented of the extent, character, aims, equipment and results of many of these important institutions, and especially of the efforts made to secure a due supply of properly-prepared students, may induce those immediately interested in and responsible for the promotion of technical training and instruction in this country to consider carefully the best means of applying the large sums now at the disposal of the public authorities for this purpose. It is to be remembered, continues the report, that the Continental technical institutions form part of an organised educational system; that they are recognised as essential to the development of the industrial arts, which depend for their progress upon the intelligence, knowledge and skill of those who control them; and that, in most cases, they are either supported by the State alone, or by the State and municipality jointly.

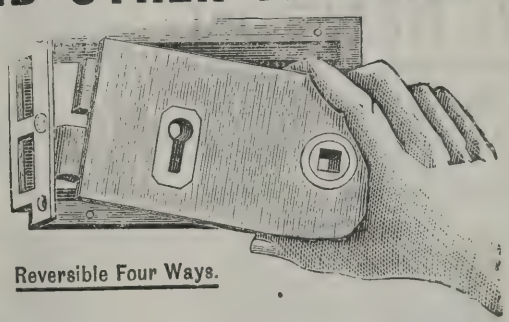
In Berlin the first visit was to the Handwerker Schule, which is an excellent example of a school for apprentices and young workmen engaged in various industrial occupations. It is open principally in the evenings and on Sunday mornings, and there are also day classes in the winter, when some branches of trade, such as painting and joinering, find little employment.

HILL'S PATENT LOCKS AND OTHER FITTINGS.



All kinds of Rim and Mortice Locks, Door Furniture, Sash and Casement Fittings, Swing-door Hinges, &c., kept in Stock.





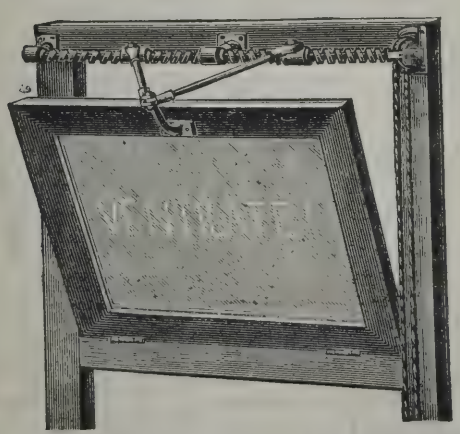
Reversible Four Ways.

Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod on right or left side.

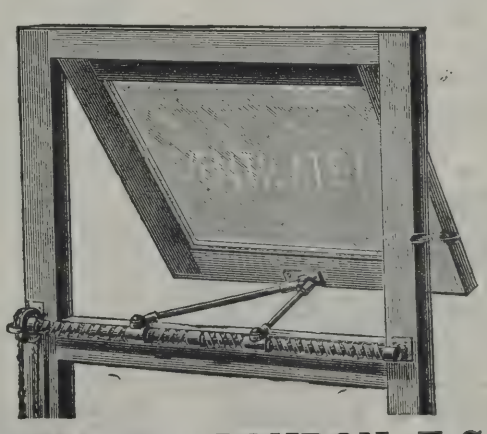
(Triple-Action Bolt.)

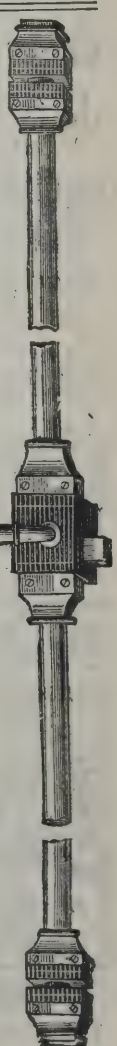


(Patent Bolt for Narrow Stiles.)









JAMES HILL, 100A QUEEN VICTORIA ST., LONDON, E.C.

There is also a special morning school for mechanics throughout the year. The fees, per half-year of about twenty-one weeks, for eight hours or less per week, are 6*s.*; for twelve hours, 9*s.*; for sixteen hours or more, 12*s.*; the day classes for joiners and painters, 5*s.* per month, and the Council may admit at their discretion needy pupils free. The students consist entirely of apprentices and young workpeople of the following ages:—1,169 from 14 to 17; 595, 18 to 21; 284, 22 to 25; 107, 26 to 29; and 57, 30 years of age and upwards. The highest number at any age was 378 at 16 years, while those over 21 are comparatively few. The occupations of the students embrace no less than 41 different trades and industries, and of 2,212 individual students only 43 were non-artisans. There were enrolled 287 mechanics, 279 house-painters, 215 joiners, 190 bricklayers, 150 locksmiths, 133 lithographers, 127 wood-carvers, 107 stone-cutters. The teaching staff numbers 45, and the engagement of teachers for special departments of technical drawing is a conspicuous feature. The average time per student in the summer half-year was $7\frac{1}{2}$ hours per week, and $7\frac{3}{4}$ hours in the winter. The municipality gives and maintains the building, and defrays all costs, so far as they are not met by the State subsidy. The expenses above the fees are 5,000*l.*, of which three-quarters are borne by the town and a quarter by the State. The estimates for 1891-92 include 1,000*l.* from the State and 3,815*l.* from the municipality. Though the rooms were crowded with students, the attention and excellent discipline were matters of noteworthy remark. No examinations are held or prizes awarded.

A school occupies part of the Museum of Industrial Art, which is of brick, with stone window dressings and string-courses. The brickwork is of the beautiful material of which so much is seen in Berlin; eight courses of alternate headers and stretchers, then a 6-inch band of ornamental red terra-cotta, the joints of the brickwork being $\frac{3}{8}$-inch wide and pointed up with a square-sunk joint. At the first and attic floors are deep bands of terra-cotta, with scrolls, panels and figures. The attic panels between the windows are decorated partly in Salviati mosaic on a gold ground, and partly in sgraffito. The windows are three-light, large, and finished with pilasters and cornices, which in the first floor have pediments. A bold cornice crowns the building, which has a wonderful effect of solidity and repose. There is a projecting *porte-cochère*, with a ramp leading up to it. The plinth and basement window openings therein are of stone, with the lower course in granite. In the centre of the building is a glass-covered hall, surrounded by granite piers, behind which is an arcade, two storeys high, lighted from the hall; on three sides beyond the arcade are two storeys of magnificently decorated rooms, with ceilings in narrow compartments, ornamented with composition looking like carved wood. The operations carried on are all those which are useful in a school of art of a very advanced character, but having a direct relation to the various art industries. A peculiarity of the establishment is that the professors have their own studios, and carry on their own work there, in which some of the pupils assist. These pupils are mostly, or have been, apprentices, and the teachers arrange terms of remuneration with their pupils who assist them. There are 582 students, of whom 131 are women, and the staff comprises 25 teachers. The day students pay 3*l.* 10*s.* for the winter half-year, and 1*l.* 16*s.* for the summer half-year; evening students, 6*s.* to 20*s.*, according to the subject and time of the year. There are several free scholarships for needy but proficient students, and free or reduced terms were granted to seventy pupils. The annual expenses amount to 4,620*l.*, the contributions of the students, in fees, to 1,030*l.*, the rest being found by the State.

The Royal Technical High School, Charlottenburg, has for its object the professional and technical training of men for the service of the State and for the higher departments of industrial life. It is an institution of the highest possible character. Its affairs are under the direction of the Minister of Public Worship and Education, and no person can get a Government appointment of a scientific and technical character without a certificate from this school. The school is organised in five divisions, and the instruction is arranged so as to carry research up to the highest attainable point in each of them. The divisions are architecture, engineering in its application to structures, mechanical engineering and shipbuilding, chemistry and metallurgy, general science, especially mathematics and natural science. The admission of students is conditional upon a certificate from a German gymnasium or a Prussian real-gymnasium (a classical and science school of the first rank), and making allowance for circumstances, a Prussian higher real schule, or an industrial school (Gewerbe schule), with a nine years' course and two foreign languages. The returns for the winter session, 1889–90, give 1,457 as the total number of regular and occasional students, the former amounting to 1,043. Of the total, 176 are foreigners, 10 of whom are Englishmen. The regular students are distributed as follows:—Architecture, 208; engineering applied to structures, 210; mechanical engineering, 358; shipbuilding, 142;

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and chemistry and metallurgy, 145. The significance of these figures may be best understood by comparing them with the numbers in the respective departments of any English scientific institution of high rank. The chemical laboratories at Charlottenburg are carried on in a plain building of stone, separate from, but near to the Technical High School, and under its general direction. There are five inorganic laboratories for 83 students; three organic for 63 students; two technical laboratories, besides several private laboratories for the teachers. It was stated that there were 120 applications for admission to the inorganic laboratories. There are gas analysis, combustion and balance-rooms, the latter supplied with thirty balances, and a library filled with chemical works, together with very spacious store-rooms. The benches are arranged for four students, two on each side, and each laboratory contains a capital nest of small drying ovens, heated steam, as well as sand and water baths. The operations for quantitative and qualitative analysis are carried on in the same rooms, and are not separated, as is generally the case with us. The work of the laboratories is carried on in numerous small rooms. This is stated to be very practical, for if by breakage any emission of noxious vapours occurs it can be confined to a single room; but from subsequent inquiry and experience elsewhere, the deputation are inclined to doubt the wisdom of the arrangement, which certainly increases the difficulty of supervision.

REGISTRATION OF PLUMBERS.

AT the International Congress of Hygiene and Demography, in the section of State Hygiene, on Thursday last, a paper was read by Mr. W. H. Bishop, master of the Worshipful Company of Plumbers, who stated that it was the joint production of Professor Garnett, principal of Durham College of Science, and Dr. Vacher, medical officer of health, Birkenhead, on "The Education, Position and Duties of Plumbers." After the reading of the paper Dr. Thorne Thorne (Local Government Board), the chairman, proposed the following resolution:—"That this meeting approves of the action of the Worshipful Company of Plumbers for improving the education and position of plumbers."

Dr. Alfred Hill (medical officer of health for Birmingham) warmly supported the resolution. He said that plumbers, as a rule, were uneducated, and the registration scheme of the Plumbers' Company would have the effect of promoting their education. As a medical officer of health of many years' standing he had had many opportunities of observing the very prejudicial effect produced on the public health by the neglect of plumbing-work and the ignorance and incompetence of plumbers. The efforts of the Plumbers' Company had received the most cordial support alike from the public authorities and the plumbers of Birmingham.

Mr. T. Anderton (president of the United Operative Plumbers' Association of Great Britain and Ireland) cordially endorsed Dr. Hill's remarks. He urged that the very best sanitary inspectors were properly educated practical plumbers.

Professor Matthew Hay, M.D. (Aberdeen University), said it was important to notice the fact elicited from the remarks of Mr. Anderton, that the great body of the plumbers themselves were in favour of the registration system. Speaking for his own town (Aberdeen) he (Dr. Hay) could state that that system had made very great progress—all the master and operative plumbers there, with one or two exceptions, being registered plumbers. The Company's educational scheme had also met with strong support. For several years past plumbers' classes had been conducted at Aberdeen, and their success was evidenced by the high positions taken by the students at various examinations. The classes elsewhere had not been less successful, and he reminded his hearers that Bailie Crawford, at the special meeting of the Congress on Tuesday last, had stated that a student in the Glasgow plumbers' classes had taken the highest award in the United Kingdom.

Professor Corby, M.D. (Cork), urged the absolute necessity for specially training and registering plumbers in the interest of the public health. He stated that many diseases are directly attributable to defective plumbers' work, and he detailed from his own professional experience a number of instances in point. A particularly striking instance was that in which he had been called to a house where he found a little girl suffering from diphtheria. He inspected the sanitary arrangements, found them very defective, and ordered the child to be removed to a house where the plumbers' work had been carefully inspected and found efficient. The child after being removed speedily recovered. The parents then took the little girl to the country for change of air, and she came back in perfect health. The parents then returned to their original house, and within a week the child was again struck down with diphtheria.

Professor Garnett (principal, Durham College of Science) laid particular stress on the fact that plumbers' work is to a

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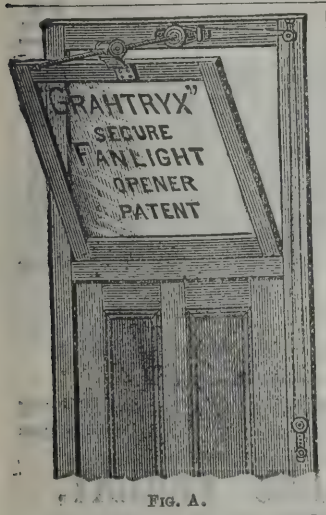


FIG. A.

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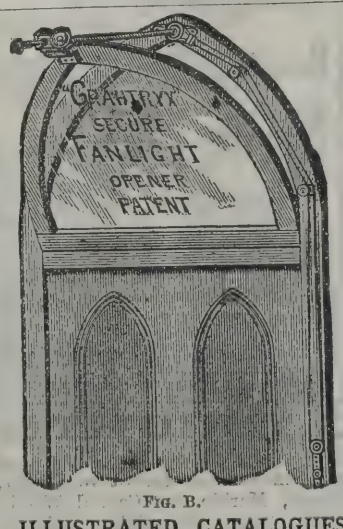
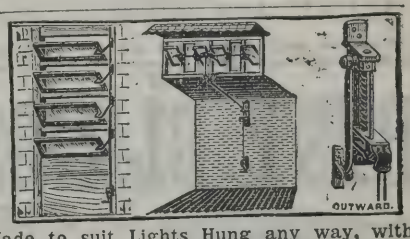


FIG. B.



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great extent hidden and exempt from efficient inspection. Therefore he urged that every plumber should be so trained that he could execute his work with due regard to sanitation. He also emphasised very strongly the necessity for plumbers receiving specialised instruction. In conclusion the speaker pointed out that, inasmuch as it is quite impossible for the plumbers themselves to provide the funds necessary to give them such a thorough course of training as it is essentia to the public health they should receive, it is the duty of all public authorities to devote a substantial portion of the funds placed in their hands for educational purposes to the establishment and maintenance of special classes for plumbers.

The Chairman said that the Plumbers' Company would find an enduring monument of the great public work they had done in the lives saved by improved plumbers' work. There were a number of prominent gentlemen present who were anxious to add their testimony in favour of the registration system, but he was sure that all present were so thoroughly agreed on the subject that it only remained for him to take their formal votes on the resolution.

The resolution was then put to the meeting and unanimously agreed to.

At the special meeting held at Burlington House, in connection with the Seventh International Congress of Hygiene and Demography, on the subject of "The Education and Registration of Plumbers in Relation to Public Health," Sir Douglas Galton presided. Among those who supported him was the master of the Plumbers' Company (Mr. W. H. Bishop), the Lord Provosts of Edinburgh, Aberdeen and Dundee, Sir Philip Magnus, Sir George Wycherley, Bart., M.D. (Cork), Sir D. Maclagan, M.D. (Edinburgh University), Sir Henry Acland, K.C.B., Dr. George Buchanan, medical officer, Local Government Board, P. Gordon Smith, architect, Local Government Board, Professor W. H. Corfield, M.A., M.D., Dr. J. Maxwell Ross, medical officer of health for the county of Dumfries, Dr. Matthew Hay, M.D. (Aberdeen University), Dr. H. E. Armstrong, medical officer of health, Newcastle-on-Tyne, Professor Corby, M.D. (Cork), Professor G. F. Armstrong (Edinburgh University), Dr. Henry Tomkins, medical officer of health, Leicester, Alderman Evan Fraser (Hull), Councillor Kirtley (Leeds), Mr. E. Hart, Mr. J. Smeaton and others.

The Chairman, in opening the proceedings, said he did not know that there was any portion of the great Congress which was being held in that building which was of higher importance than the subject for the discussion of which the meeting had been convened. They were doubtless aware that the health of communities depended in a great measure upon the efficient carrying out of details of plumbing, and the Plumbers' Company had been most anxious during the last few years to improve the education of workmen engaged in this important branch of work. He could assure the Plumbers' Company he had always felt the warmest sympathy with their efforts, and he could bear witness to the work done by the Master and Wardens of the Company, and he might add that their efforts had produced the most valuable results.

The Master of the Plumbers' Company then read a short report he had prepared on the subject, in which he referred to the efforts made by the Company to extend among workmen a technical knowledge of the art of plumbing by the registration of qualified men. It was now about seven years since this work had been begun, and at the present time there were 950 persons engaged in the chief towns of the United Kingdom and Ireland in assisting to carry out the objects of the movement. The movement had, however, now reached a position when it was felt that it was necessary to give some legislative encouragement to it, and the Court of the Plumbers' Company had drawn up a draft Bill which they considered should be presented to Parliament during the next session, for the purpose of carrying out the proper education and registration of plumbers in the United Kingdom. On the motion of the Lord Provost of Edinburgh, seconded by Bailie Crawford (chairman of the Health Committee of the City of Glasgow), and supported by Sir Charles Cameron (medical officer of health for the city of Dublin), the following resolution was passed :—"That this special meeting of the International Congress of Hygiene, assembled to consider the necessity for securing the greater sanitary efficiency of the plumbers' work and the drainage of dwelling-houses and other buildings, desires to record its opinion that an organised and efficient system of registration of qualified plumbers is essential to the protection and preservation of the health of the community, and that such a system having been established in the chief cities and towns in Great Britain and Ireland by the joint action of the Worshipful Company of Plumbers, London, and the plumbers and sanitary authorities of those places, the time has now arrived when application should be made to Parliament for power enabling a Council of competent jurisdiction and authority to take measures for systematically promoting technical education among plumbers in all parts of the United Kingdom, and regulating

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the practice of those plumbers who are enrolled as registered members."

The meeting was attended by a large number of mayors, lord provosts, provosts, chairmen of health and sanitary committees, medical officers of health and other representatives of the chief cities and towns of Great Britain and Ireland.

LIVERPOOL'S WATER SUPPLY: THE TUNNEL, FIDDLERS FERRY.

THE work of driving the tunnel at Fiddlers Ferry, for the permanent supply of water to Liverpool, is proceeding satisfactorily if slowly. The total length of tunnel required to be constructed is about 800 feet, and of this the work done by the present contractors during the greater part of the year only amounts to 155 feet, the limit reached at the time of writing. It must be, however, borne in mind, says the *Liverpool Courier*, that most exceptional difficulties have had to be overcome, and, taking these into consideration, the contractors are to be congratulated upon the success which has so far attended their efforts. The former contractors, Messrs. Monk & Newell, of Bootle, commenced on the Cheshire side, and sunk a shaft of 84 feet, afterwards driving a tunnel of 57 feet. They were, however, stopped by such an inrush of material that this portion of the work was then and there abandoned. A shaft was then sunk on the Lancashire side to a depth of about 100 feet, when, in January 1890, the contract was relet to Messrs. Cochrane & Sons, London. The present contractors elected to drive the tunnel at a higher level, and the boring was commenced by means of a circular shield, which is yet used for this purpose. Some months' delay was caused through difficulty in getting proper machinery to the work, but since the machinery arrived the progress, as has been stated, has been satisfactory, though the shifting nature of the material through which the tunnel has to be driven makes the work one of great difficulty. On July 29 work was suspended in consequence of some of the plates having given way, but these have been replaced, and by the 10th inst. all was right again. The new tunnel is only 50 feet below the surface, and as the river is 12 feet deep at this point the depth of the tunnel below the bed of the river is not great. On the Cheshire side the shaft was some time ago sunk to the required depth. The work in connection with the temporary scheme is now nearly completed. At present the supply of water to the city is carried across the river by a 12-inch pipe laid on the bed of the river by pipes of flexible steel. This pipe is 816 feet long, and contains fifty sections. On the Cheshire side the Ship Canal is crossed by a temporary 15-inch pipe which is laid on the bed of the canal, but this will soon be replaced by a temporary 21-inch pipe. This latter pipe will be sunk to a depth of 18 feet below the present bed of the Manchester Ship Canal, according to the requirements of the promoters of that undertaking. The 21-inch pipe is almost completed, only one joint requiring to be fixed. This will be connected with the other temporary pipe across the river, and thus enable the supply of water to be increased materially. Should this prove insufficient provision has been made for the laying of a duplicate pipe alongside the present temporary tubes, but the laying of such duplicate pipes would necessarily mean a very considerable expenditure of money.

COTTAGE HOSPITAL, BROMSGROVE.

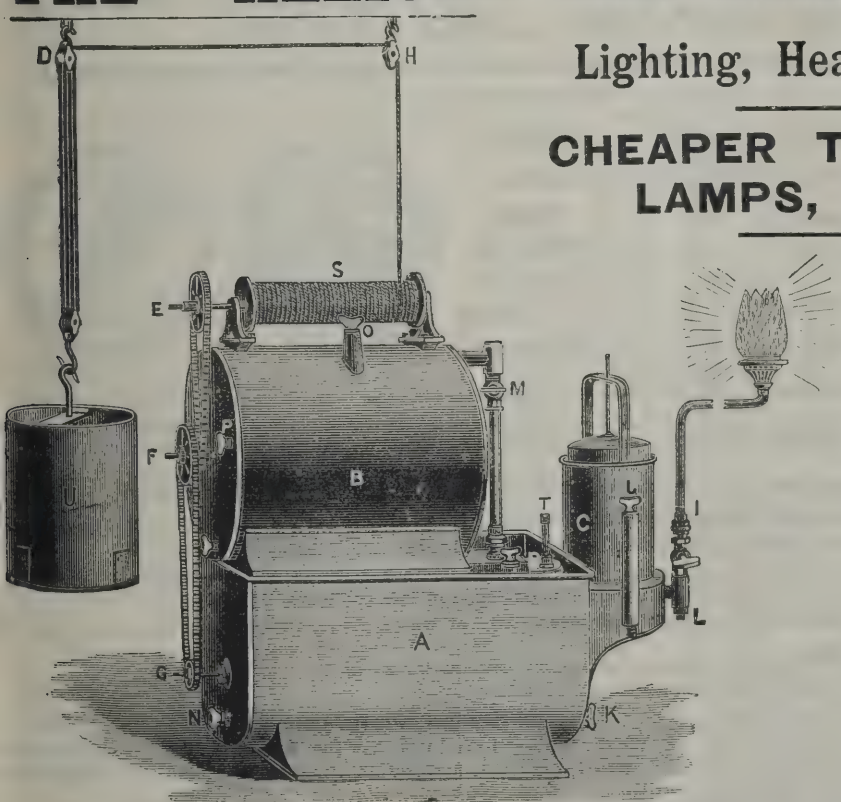
THE engraving shows the new cottage hospital which has just been opened at Bromsgrove by the Earl of Coventry. The building has been designed on the pavilion system as a central block and two side wings, connected by corridors. The east wing contains the male ward called the Arthur Ryland ward, out of compliment to Dr. and Mrs. Chavasse, who undertook to erect and furnish it at their own expense. The ward on the west side is devoted to females. Each ward is 35 feet by 18 feet 6 inches by about 12 feet in height, with accommodation for six beds. In connection with the wards and at the rear are the sanitary offices, consisting of bathroom, lavatory (with nurses' sink) and water-closets. These offices are so connected with the wards that a cross-draught can be obtained to prevent any smell entering the wards. The centre block has a handsome entrance with vestibule and central hall, with corridors leading to the main wards. On either side of the main entrance are the day-room for convalescent patients and the matron's room, each about 16 feet by 13 feet. Leading from the central hall towards the rear is a passage, opening on to which is a linen-store and staircase to the upper floor, surgical ward, operating-room, dispensary, splint store, housekeeper's store, nurses' watercloset, and large kitchen about 16 feet square, with range, pantry and larder, small heating chamber, and a scullery which opens into the yard. Arranged round the yard are a mortuary (which will also be available as a wash-house and post-mortem-

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room), a disinfecting chamber, a wood and coal store, and places for garden tools and ashes. The buildings are one storey in height, except the front portion of the centre block, which is carried up two storeys, and provides a large bedroom, which is available for an additional ward if necessary, three bedrooms for the matron and the nurses and two small store-rooms. Ample cellaring accommodation is provided in connection with the kitchen. The work has been carried out in sound, hard red bricks, with pressed bricks to the principal elevations, and



Grinshill stone has also been used to enrich the main entrance and certain of the windows. The gables are finished in half-timbered style, with solid oak timbers filled in with brick and cemented between, and with moulded bargeboards to over-hangings. The centre roof is hipped, and the roofs are covered with purple Staffordshire tiles. The inside walls of the wards are finished in Portland cement, with smooth face, as also the lower part of the internal walls generally. The dado of the operating-room is finished with glazed bricks.

The central hall is warmed with hot-water pipes, and the baths are supplied with hot water from a boiler behind the kitchen fire. The hot-water arrangements have been executed by Messrs. Ward, of Worcester. Sinks have been provided in the operating-room, the dispensary, the scullery and the mortuary. The ceilings are plastered, and the whole of the woodwork is stained and varnished, except that of the exterior, which is, of course, painted. Special arrangements are made as to ventilation and lighting. The wards and day and matron's rooms have wood floors, those of the wards being laid double with upper boards of narrow pitch pine. The vestibule and hall are laid with encaustic tiles, those to the vestibule being bordered ornamentally. The corridors and passages are paved with best blue and red quarries, laid to a pattern, and the kitchen and domestic offices have a flooring of the best red quarries. The matron's room and the day-room are provided with bay windows and a small balcony, with a beautiful wrought-iron railing, in which flowers can be placed, projects over the

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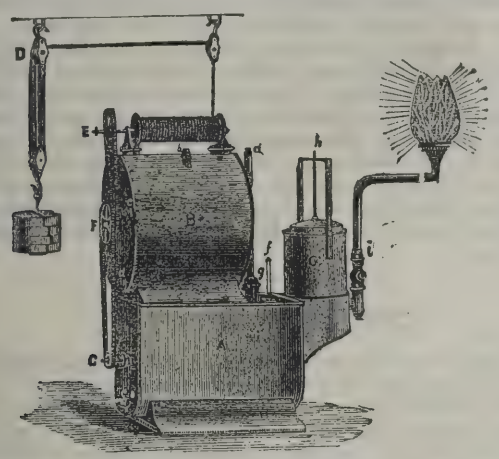
Address—KALLKOLITH CO., 175 STRAND, LONDON, W.C.

central entrance. All the principal walls are 14 inches thick and the other walls 9 inches. The formation of paths and laying out of the ground has been done by the builder from the architect's plans.

The architect is Mr. John Cotton, F.R.I.B.A. (Messrs. Cotton & Bidlake, Bromsgrove and Birmingham), the builders being Messrs. J. Brazier & Son, of Bromsgrove.

THE "HELIOS" GAS-MAKING MACHINE.

Mr. Julius Moeller, the inventor of the "Helios" gas-making machine, has favoured us with further details as to its construction and working, which we have pleasure in submitting to our readers. Below is an illustration of the "Helios." For



he purpose of explanation we will divide the machine into two parts—A and B.

Part A—the tank—contains water, which keeps the hydrocarbon used at an equal temperature for its perfect evaporation, which is imperative in gas-making machines.

Part B contains a fan or blower which draws in the atmospheric air, and discharges the same at any desired pressure through the carburettor fixed inside the tank (A), which becomes impregnated with the vapours of the benzoline, and passes from the carburettor to a specially-constructed governor or regulator (C) as hydrocarbon gas, from which it is drawn for use.

It will be readily understood from the above drawing that the "Helios" stands alone in the simplicity of its construction, while it may be claimed with equal truth that in actual working the oil tank has only to be kept filled to insure its automatic action, without the slightest anxiety to the user. The only gas-producing material necessary, benzoline, is easily obtainable, and a sufficient supply can be put in the tank to last eight days. This is an important feature, for previous machines have defeated the purpose for which they were intended, by specifying some oil to be used that could not readily be procured in small quantities. These drawbacks have no doubt militated against the more general adoption of gas-making machines, and they have hitherto been used only when no other means of lighting were possible. But there is no reason why, under the improved conditions of the Moeller patent, this method of lighting should not compete with gas companies, and even with electric light. The gas produced is 50 per cent. cheaper than ordinary gas in London and of higher candle-power, whilst the advantage of being the proprietor of your own gas, and regulating the consumption of it, by burning any number of lights required, is a matter that should be taken into consideration. The inventor claims that the cost of each machine is saved in twelve months. We have made a careful inspection of the "Helios" in operation, and can fully confirm the merit that is claimed for it. The machine itself can be put in a corner—it needs no attention—and the light produced is remarkably white and brilliant, unaccompanied by smell. An incandescent gas-light burner (Welsbach system) of special pattern has been designed for the "Helios," consisting of three parts—brass part, mantle or incandescent body and globe, no chimney being required, and the result is a light that cannot be excelled.

We are confident the "Helios" will be largely adopted, when its merits are more widely known, for country houses, hotels, public buildings and in every direction where a cheap and efficient light is desired. The coming season will doubtless bring a large demand. We should mention that the Incandescent Gaslight Co., Limited, the proprietors, are prepared to fix the machine in any part of the country and to do all the necessary gasfitting in connection with it, so that efficient workmanship should be secured. Mr. Moeller and the Incandescent Gaslight Co., Limited, are to be congratulated on their most recent enterprise, for which we predict a conspicuous success.

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The "Helios Gas-making Machine" can be inspected at the works of the Incandescent Gaslight Co., Limited, 14 Palmer Street, Westminster, S.W.

THE RIBBLE SCHEME.

THE final report of the Commission appointed by Parliament to report upon the practicability and probable cost of providing a navigable waterway between Preston and the open sea and other points in connection with the scheme of Ribble development, has appeared. The Commission consisted of Sir George Nares, K.C.B., Sir Charles A. Hartley, K.C.M.G., C.E., and Mr. John Wolfe Barry, C.E. The report first deals with the selection of the best navigable waterway between Preston and the open sea, and next with the costs necessary to secure it. The three courses for the waterway are the north channel, running past St. Anne's-on-Sea, the south channel, past Southport, and the central channel. The Commissioners deal at length with the advantages and disadvantages of the three channels, and suggest the central as the most direct course from Preston to the sea. As to the question of the cost, the Commissioners are not prepared to recommend the whole of the outlay necessary for the immediate construction of the whole of the channel they contemplate. The estimated cost for such a channel is given at what they call the startling sum of 756,000*l.* The Commissioners therefore say that, after mature consideration of all the bearings of the subject, they only venture to recommend the provision of a fixed channel from Lytham to the fourteenth mile, and the cost of this they estimate at 220,000*l.* They consider that the subject of any prolongation should have further consideration when the result of the extension to fourteen miles had been experienced. They leave the recommendations of the interim report as to training walls where they stand, and in the matter of dock equipment they hold that the expenditure should be 18,000*l.*, subject to an increased outlay of 6,500*l.* to provide hydraulic machinery in lieu of hand-gear suggested in the interim report for the opening and closing of the dock gates and sluices, to form roads and sidings round the docks, to provide gas and water supply, and to build a small warehouse. But the additional amount of 6,500*l.* is to be forthcoming from a balance accruing through a certain branch of proposed expenditure falling short of the estimate by that amount. The corporation had asked for 61,000*l.* to be spent in addition, but the Commissioners do not recommend the outlay, on the ground that, although there is hope of a future coal trade, no such trade "has as yet been guaranteed; and although they agree that in order to attract trade proper facilities must be provided, it appears to the Commissioners that the question of what the extent of expenditure on future equipment ought to be is one which should be left to be discussed in Parliament in the light of intermediate events." On the question of control the Commissioners adhere to the opinion, "that when the dock has been opened and trade developed a dock and harbour trust should be constituted." Not the least interesting part of the report deals with the financial and rating considerations. When the borrowing powers are exhausted at the end of the present year the total expenditure will be "over 1,000,000*l.*; and this will mean a rate of 2*s.* 8*d.* in the pound." The original scheme cannot now be completed "without an addition to the capital commitments of the town of 816,000*l.*," meaning a possible maximum rate of 4*s.* 9*d.* in the pound; and in face of this large outlay, and as the best solution of the present difficult situation, they have sanctioned the lesser outlay. This will involve an addition of 8½*d.* to the 2*s.* 8*d.* which will be necessitated by the present capital commitments. The Commissioners say:—"Even if the works are carried out there must still remain many difficulties of navigation for large vessels in a tidal channel sixteen miles in length, and trade has to be attracted to Preston from other docks, and so to be more or less created in the face of natural difficulties."

THE LATE J. WILLET, C.E.

ON Saturday the death occurred in Aberdeen of Mr. John Willet, C.E., a gentleman well known in Scotland as a distinguished member of his profession. The deceased, who was a native of Aitkenhead, Kirkmichael, Perthshire, was educated at Ayr Academy, and afterwards attended classes in the School of Arts, Edinburgh. In 1837 he commenced his professional career by entering as an apprentice the office of Mr. James Thomson, C.E., Glasgow, and at the conclusion of his apprenticeship he became an assistant to Mr. Andrew Thomson, also a civil engineer in Glasgow. Mr. Thomson had much experience in the construction of railways, and Mr. Willet was for a time engaged on the Glasgow and Garnkirk and Pollok and Govan railways. In 1843 Mr. Willet went to Liverpool as an assistant to the famous railway-making firm of Messrs. Locke & Errington, civil engineers, and here he remained till 1851.

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That period covered the age of the great railway-making mania, and the deceased was engaged in many different parts of England and Scotland in carrying out the construction of the Grand Junction Railway (between Birmingham and Warrington), the Lancaster and Carlisle Railway, the Harrogate Railway, the London and York Railway, the Runcorn Loop Railway, the Caledonian Railway, the Birkenhead and Manchester Railway, and the Aberdeen Railway. In 1845 Mr. Willet was appointed one of the resident engineers in charge of the construction of the lines authorised by the Caledonian Railway Act of 1845 from Carlisle northwards. In this position he remained till 1849, when he came to Aberdeen, having been appointed resident on the Aberdeen Railway, which was afterwards amalgamated with the Scottish North-Eastern Railway, and he held this appointment and was engaged in general engineering business throughout all the changes and amalgamations that took place down to 1866, when the Scottish North-Eastern was absorbed in the Caledonian. He was thereafter employed by the Caledonian in completing the Denburn Valley, the Dundee and Forfar, and the Newtyle branches, &c. From 1849 to 1869 Mr. Willet was engaged in the construction of the Deeside Railway, in the Alford Valley, Peterhead, and Fraserburgh, and Oldmeldrum Railways; on the Arbroath and Forfar, Waterford and Kilkenny, Fife and Kinross, Montrose and Bervie, Dundee and Forfar, and other railways; at the Perth general terminus, and in the construction of bridges over the Dee and Don. Thus for a period of over thirty years he was, in fact, engaged almost exclusively in the projection of railways. After severing his official connection with the railway, Mr. Willet was engaged in Aberdeen in the general practice of his profession. Besides continuing the construction of railways, or being employed in different capacities in connection therewith—the last projected by him being a line from Brechin to Edzell, for which an Act of Parliament was obtained last year—he constructed a large number of harbours, bridges, waterworks, drainage systems; the harbours including those of Johnshaven, Cruden, Fraserburgh, Sandhaven, Rosehearty, &c.; and the bridges those over the Lossie at Bishopmill, and Inchbroom, Elgin, over the Deveron at Rathiemay and Banff, over Ythan at Kinharrachie, over the Leven at Balloch, and over the Findhorn. His water-supply systems included many of the towns in the north, and the drainage schemes of Montrose, Forfar, Nairn, Brechin, Banff and Inverness were carried out according to his plans. In 1851 he was elected a Fellow of the Royal Scottish Society of Arts; and in December 1852 he was made a member of the Institution of Civil Engineers, London. The deceased is survived by a family of four sons and three daughters, the eldest of whom, Mr. John L. Willett, is an advocate in Aberdeen. Mr. Willet was born in 1815, and was thus in the seventy-sixth year of his age.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

Applications for Patents.

13196. Henry Gardner, for "Improvements in or connected with sashes provided with sliding windows, panels and the like."

13236. Louis Cormerois, for "Improvements in suspension bridges."

13243. Charles Henry Gatchell and Albert James Gregory, for "An improved vice or clamp."

12368. William Willson Horn, for "Improvements in electrical fire-alarms."

13287. Austin Walters, for "Improvements in, or applicable to, the foot-lights of theatres, music-halls, or other similar places."

13299. William Graves and John Cressey, for "Improvements in the manufacture of oil-baize cloth for covering walls, partitions and the like."

13312. Henry Robert Marshall, for "Improvements in keys for locks, latches and other uses."

13344. Eric Hamilton Whiteford, for "Improvements in fixing sash cords."

13417. William James Villar, for "Improvements in scales for ascertaining the measurement of property shown on ordnance maps."

13418. Edward Ackers, for "Improvements in treads for floors, passages and stairs."

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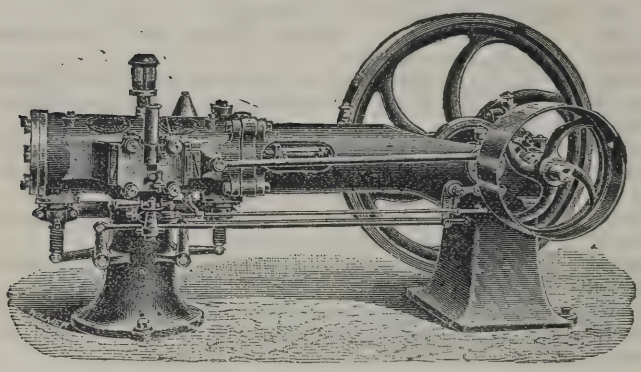
THE

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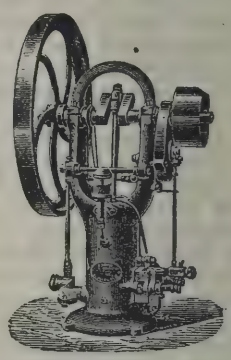
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to The Architect.

LONDON, AUGUST 28, 1891.

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Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

ABERAVON.—Sept. 10.—Designs are invited for the Proposed Port Talbot Technical and Intermediate School. Mr. M. Pennant, Town Clerk's Office, Aberavon.

BATH.—Oct. 10.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

EASTLEIGH.—Sept. 28.—Plans are required for Sewerage and Sewage Disposal. Mr. Joseph Robins, Clerk to the South Stoneham Rural Sanitary Authority, 19 and 20 Portland Street, Southampton.

LUTON.—Sept. 8.—Designs are invited for Alterations to Waller Street Plait Hall. Mr. E. J. Lovegrove, C.E., Town Hall, Luton.

SHREWSBURY.—Sept. 30.—Designs, &c., are invited for Building Police Station, Constable's House, &c. Mr. W. C. Eddowes, Borough Surveyor, The Square, Shrewsbury.

CONTRACTS OPEN.

ABERDEEN.—Aug. 31.—For Works in Building Mann's Palace Hotel. Messrs. Matthews & Mackenzie, Architects, 255 Union Street, Aberdeen.

ABERGAVENNY.—Aug. 31.—For Building Stone-arched Bridge. Mr. James H. Farquhar, Clerk to the Highway Board, Abergavenny.

ACTON.—Aug. 31.—For Constructing Road and Sewer Messrs. Maddox & Son, Surveyors, 9 Warwick Court, Gray's Inn, W.C.

ALDEBURGH.—Aug. 31.—For Heating Church by Hot Water. Mr. E. F. Bishopp, Architect, 22 Museum Street, Ipswich.

ALFRETON.—Aug. 29.—For Building Small Cemetery Chapel. Mr. E. Houfton, Surveyor, Local Board Offices, King Street, Alfreton.

ARMAGH.—Aug. 31.—For Additions to Lunatic Asylum. Mr. Phillips, 61 Royal Avenue, Belfast.

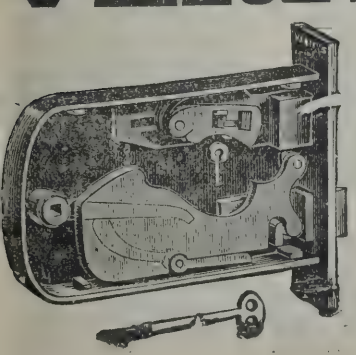
BARGOED.—Sept. 14.—For Classroom to Board School. Mr. John Williams, Architect, 4 Edward Street, Morgan Town Merthyr Tydfil.

BEAUMARIS.—Sept. 1.—For New Buildings and Repairs on Farms, Baron Hill Estate, Mr. R. G. Thomas, Architect, Menai Bridge.

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BELFAST.—Sept. 1.—For Constructing High-level Sewer. Mr. Samuel Black, Town Clerk, Belfast.

BLACKPOOL.—Aug. 28.—For Supply of One and a Half Million of Common Bricks for the Tower Company. Messrs. Maxwell & Tuke, Architects, 29 Princess Street, Manchester.

BLACKWALL.—Oct. 12.—For Constructing (by Compressed Air) and Maintaining Carriageway and Footway Tunnel under the River Thames. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

BRADFORD.—Sept. 4.—For Extension of Premises, Bolton Road. Messrs. T. H. & F. Healey, Architects, Tyrrel Street, Bradford.

BRADFORD.—Sept. 1.—For Additional Buildings at Workhouse. Mr. S. Jackson, Architect, Tanfield Chambers, Bradford.

BRADFORD.—Sept. 1.—For Heating Methodist Chapel and School. Mr. A. Barraclough, 60 School Street, Low Moor, Bradford.

BRIDGEND.—Aug. 31.—For Building Parsonage, Kenfig Hill. Messrs. Halliday & Anderson, Architects, 16 High Street, Cardiff.

BRISTOL.—Sept. 3.—For Five Iron Gates with Pennant Stone Piers, Dwarf Walls and Iron Railing, Victoria Park. The Surveyor, 51 Prince Street, Bristol.

BURNLEY.—For Additions, &c., to Berry's Commercial Hotel, St. James's Row. The Proprietor.

BURTON-ON-TRENT.—Aug. 29.—For Construction of Cast-iron Tank. Mr. F. L. Ramsden, Gas-Engineer, Gasworks, Burton-on-Trent.

CAPCOCH.—Aug. 29.—For Building Sixty Dwelling-houses. Mr. T. L. Davies, Manager, Abercwmbol Colliery, near Aberdare.

CARDIFF.—Aug. 31.—For Building Premises, Park Place, for Hotel Company. Messrs. T. Waring & Son, Architects, 1 Charles Street, Cardiff.

CARDIFF.—Sept. 16.—For Alterations and Additions to Free Library. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CHARD.—Aug. 31.—For Building Police Station and Residence. Mr. C. E. Norman, County Surveyor, Hammet Street, Taunton.

CHIPPENHAM.—Sept. 10.—For Sewerage Works. Mr. A. H. Lapham, Surveyor, Biddestone, near Chippenham.

COVENTRY.—Aug. 31.—For Drainage System for Warehouse, Erecting Soft-water Tank and Boundary Wall. Messrs. Steane, Architects, Little Park Street, Coventry.

CUCKFIELD.—Sept. 3.—For Constructing Sewers. Mr. James Mansergh, Engineer, 5 Victoria Street, Westminster.

DANYGRAIG.—Sept. 2.—For Building Forty-six Houses. Mr. T. R. Phillips, Architect, Old Bank Chambers, Market Square, Pontypridd.

DARTFORD.—Sept. 12.—For Supplying and Setting Boilers, Engine, &c. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

DENBIGH.—Aug. 31.—For Building Chancel and Alterations to St. David's Church. Mr. R. Lloyd Williams, Architect, Park Lane, Denbigh.

DENBIGH.—Sept. 1.—For Building Three Houses. Messrs. C. H. Marriott & Son, Architects, West Park Street, Dewsbury.

DUBLIN.—Sept. 2.—For Additions to Ordnance Survey Office. Mr. W. B. Soady, Office of Public Works, Dublin.

EDINBURGH.—Aug. 31.—For Lattice Girder Foot Bridges. Messrs. Leslie & Reid, Engineers, Edinburgh.

ENFIELD.—Sept. 9.—For Supply of Broken Granite. Mr. E. Letchworth, Court House, Enfield.

FLAMBOROUGH.—Aug. 28.—For Works of Sewerage. Mr. Samuel Dyer, Engineer, Helstonleigh, Quay Road, Bridlington Quay.

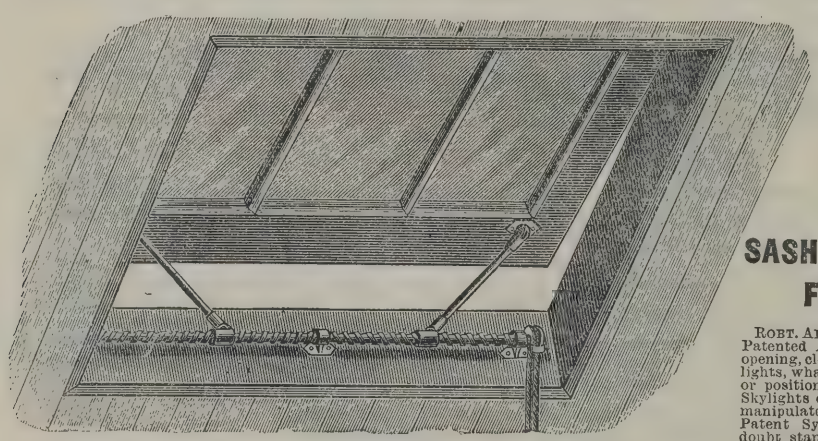
FLOCKTON.—Sept. 14.—For Laying Water Pipes, Constructing Meter House, Pumping Station, &c. Mr. W. J. Wood, Engineer, Flockton.

FRAMPTON COTTERELL.—Aug. 29.—For Building Schoolhouse. Mr. A. Barratt, Surveyor, Somerset Chambers, Corn Street, Bristol.

GALLOWAY.—Aug. 28.—For Building Houses. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

GUISELEY.—Aug. 29.—For Reseating and Heating Church. Messrs. Armistead & Parkinson, Architects, Bingley.

HAMPSTEAD HEATH.—Sept. 29.—For Erecting Public Conveniences. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.



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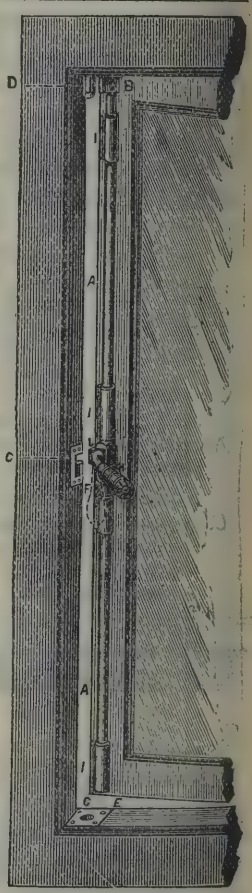




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HAYWARD'S HEATH.—Aug. 28.—For Additions to Ward at County Lunatic Asylum. Mr. Henry Card County Surveyor, Lewes.

HORNSEY.—Sept. 12.—For Building Public Baths and Washhouses. Mr. A. Hessell Tiltman, Architect, 70 Torrington Square, W.C.

HORNSEY.—Sept. 16.—For Making Good Roads. Mr. T. De Courcey Meade, Engineer, Local Board Offices, Southwood Lane, Highgate, N.

ISLINGTON.—Sept. 12.—For Building Public Baths and Washhouses. Mr. A. H. Tiltman, Architect, 70 Torrington Square, W.C.

JARROW.—Sept. 3.—For Building Mortuary. Mr. J. Petree, Borough Surveyor.

KEIGHLEY.—For Building Banking Premises, Offices and Manager's House. Messrs. W. & J. B. Bailey, Architects, Keighley.

KIDDERMINSTER.—For Building Free Library. Mr. J. M. Gething, Architect, Oxford Chambers, Kidderminster.

LAMBETH.—Sept. 2.—For Alterations and Additions to Workhouse. Mr. T. W. Aldwinckle, Architect, 2 East India Avenue, E.C.

LEEDS.—Sept. 3.—For Building Wesleyan Chapel, Shadwell. Mr. T. Butler Wilson, Architect, 12 East Parade, Leeds.

LLANHILLETH.—Sept. 1.—For Building Twenty Houses. Mr. T. C. Wakeling, Architect, Merthyr.

LONDON.—Sept. 2.—For Supply and Delivery of 5,000 Closet-pans. Messrs. Eastwood & Co., Belvedere Road, Lambeth, S.E.

NORTH-EASTERN RAILWAY.—Sept. 2.—For Building Sixty-eight Dwelling-houses in Flats, Two Storeys High, and Works in Connection, Felling-on-Tyne. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

NORWICH.—Aug. 31.—For Repairs to County Bridge, Stoke Mill. Mr. T. H. B. Heslop, County Surveyor, Norwich.

OXFORD.—Sept. 12.—For Building Stables, Shedding, &c. Mr. W. H. White, City Engineer, Oxford.

PENARTH.—Sept. 5.—For Private Street Improvement Works. Mr. J. W. Morris, Clerk to the Local Board, Penarth.

PENRITH.—Aug. 28.—For Superstructure (except Masonry and Fireproof Floors) of Nunwick Hall. Mr. Charles J. Ferguson, F.S.A., Architect, Carlisle.

PLASHET.—Aug. 28.—For Alterations at Industrial School. Messrs. Wilson, Son & Aldwinckle, Architects, 2 East India Avenue, London, E.C.

PLYMOUTH.—Sept. 1.—For Building Stores, Stable and Cartshed. Mr. John Watts, Secretary to the Cemetery Company, Plymouth.

PLYMOUTH.—Sept. 3.—For Dredging in Sutton Harbour. Mr. J. C. Inglis, Engineer, 1 Buckland Street, Plymouth.

PONSHONORTON.—Aug. 28.—For Building School. Mr. T. Rowland, Architect, Market Buildings, Pontypridd.

PONTYPRIDD.—Sept. 5.—For Converting House, Hopkin's Town, into Sunday School. Mr. W. I. Morris, Norfolk House, Pontypridd.

PRESTON.—Sept. 4.—For Building School for Deaf and Dumb. Messrs. Sames & Green, Architects, 65 Northgate Blackburn.

READING.—Sept. 2.—For Machinery and Fittings for Sewage Pumping Station. The Borough Engineer, Town Hall, Reading.

READING.—Sept. 10.—For Removing Blake's Bridge, &c. Mr. Arthur T. Walmisley, 9 Victoria Street, Westminster, S.W.

REIGATE.—Sept. 8.—For Sewerage and Sewage Disposal. Mr. John Anstie, Engineer, 17 Victoria Street, Westminster, S.W.

RINGWOOD.—Aug. 31.—For Boundary Walls and Enlarging Cemetery. Mr. George P. Brown, Clerk to the Burial Board, Ringwood.

SEVENOAKS.—Sept. 4.—For Constructing Sewers and Making-up Roads. Mr. Jabez Mann, Surveyor, Local Board Offices, Argyle Road, Sevenoaks.

SITTINGBOURNE.—Sept. 7.—For Supply of Broken Granite. Mr. W. J. Harris, Local Board Offices, Sittingbourne.

SOUTHAMPTON.—Sept. 8.—For Strengthening Portion of Town Quay Extension for Electric Cranes. Mr. J. G. Poole, Surveyor, 2 Portland Street, Southampton.

SOUTH SHIELDS.—Sept. 8.—For Construction of Tanks and Gearing for Shipment of Refuse. Mr. J. Watt Sandeman, Engineer, 2 Nicholas Buildings, Newcastle-on-Tyne.

STOCKPORT.—Aug. 28.—For Construction of Brick Retaining Wall (330 feet long), West Bank of the Mersey. Mr. A. M. Flower, Engineer, Borough Chambers, Stockport.

Awards—Gold Medal, Saltaire, 1887; Silver Medal, Brussels, 1888; Silver Medal, Paris, 1889; Gold Medal, Brighton, 1889

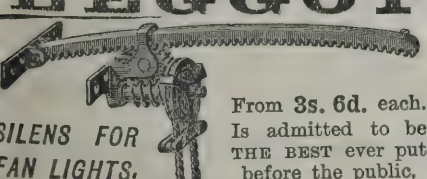
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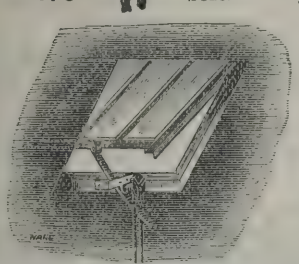
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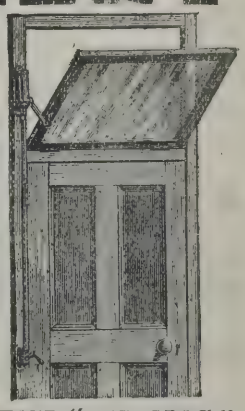
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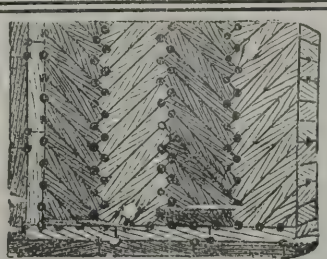
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SUNDERLAND.—Aug. 31.—For Building Junior School and Laboratory. Mr. T. W. Bryers, Clerk to the School Board, 15 John Street, Sunderland.

SUTTON.—Sept. 7.—For Constructing Sewers. Mr. John Anstie, 17 Victoria Street, S.W.

SUTTON-IN-ASHFIELD.—Aug. 29.—For Building Three Shops and Alterations to Premises. Mr. J. P. Adlington, Architect, High Pavement, Sutton-in-Ashfield.

TOTNES.—Aug. 28.—For Works at St. John's Church, Bridgetown. Mr. W. M. Tollit, Architect, 10 High Street, Totnes.

TUAM.—Sept. 2.—For Building Wing to Workhouse. Mr. J. Harris, C.E., Galway.

ULVERSTON.—Sept. 7.—For Enlarging Board Schools. Messrs. J. W. Grundy & Son, Architects, Brogdent Street, Ulverston.

UPPER WARLINGHAM.—Sept. 8.—For Building House and Stables. Mr. F. H. Holdsworth, Architect, 110 Fenchurch Street, E.C.

USK.—For Building Two Villas. Mr. H. Lewis, Timber Merchant, Usk, Mon.

WALTHAMSTOW.—Aug. 28.—For Supply of Broken Granite. Mr. Gilbert Houghton, Town Hall, Walthamstow.

WATFORD.—Sept. 2.—For Supply of Cast-iron Pipes for Water-mains. Mr. H. Morten Turner, 66 High Street, Watford.

WELLINGBOROUGH.—Aug. 28.*—For Building Stores. Messrs. Talbot Brown & Fisher, Architects, Wellingborough.

WEST HAM.—Sept. 22.—For Building Public Hall and Offices. Mr. Lewis Angell, Town Hall, Stratford, E.

WETHERAL.—For Building Cemetery Chapel and Entrance Gate. Mr. A. W. Johnston, Architect, 27A English Street Carlisle.

WIGAN.—Sept. 1.—For Building Church. Mr. W. Wright, Surveyor, Lancaster.

WITHAM.—Aug. 31.—For Building Schoolrooms, Extension of Laundry, &c., at South Metropolitan School. Mr. Henry Burgess, Brighton Road, Sutton, Surrey.

* Names and addresses to be forwarded not later than date.

WOODLESFORD.—For Building Vicarage, also Detached House. Mr. Robert J. Smith, Architect, 61 Albion Street, Leeds.

YORK.—Aug. 31.—For Supply of Granite and Whinstone Setts. Mr. Alfred Creer, City Surveyor, Guildhall, York.

YORK.—Sept. 1.—For Supplying and Fixing Office Furniture for Police Offices at Courts of Justice. Mr. Alfred Creer, City Surveyor.

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ABINGDON.

For Building Crown Post Office, Abingdon, for the Commissioners of H.M. Works and Public Buildings.

T. H. Kingerlee	£2,380 0 0
Martin, Wells & Co.	2,353 0 0
E. Williams	2,319 0 0
W. GOODCHILD (*accepted*)	2,170 6 9

BRECHIN.

For Building Free Library, Brechin. Mr. FAULEY, Architect.

Accepted Tenders.

Crockatt, Brechin, mason.
Fettis & Stephen, Montrose, joiner.
James Scott, Brechin, slater.
James Gibson, Brechin, plasterer.
Cook & Son, Arbroath, plumber.

BUCKFASTLEIGH.

For Building House, Buckfastleigh, for the Rev. F. Pascoe.

A. Wakeham	£486 0 0
J. Weeks	472 0 0
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Jackson & Son	449 0 0
F. W. Vanstone	436 0 0
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For New Wing, Offices, &c., Morley Convalescent Home, St. Margaret's, near Dover. Mr. G. D. STEVENSON, A.R.I.B.A., Architect, 13 and 14 King Street, Cheapside, E.C.

Johnson & Co., London and Dover	£3,600 0 0
W. Bromley, Dover	3,490 0 0
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G. H. Wilkins, Bristol	964 0 0
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Eastabrook & Sons, Bristol	946 0 0
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A. J. BEAVEN, Bedminster (*accepted*)	880 0 0

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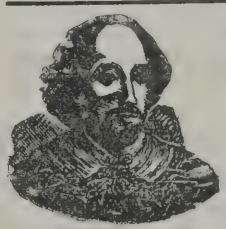
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T. Hine & Son, excavating, walling, mason and slating,
W. Hutchinson, carpenter and joiner.
W. Parsons, plumbing, gas and water fitting.
W. Jackson, glazing and painting.
B. Davis, plasterer.
Total—£210.

LARGS.

For Building Board School, Largs.

Accepted Tenders.

Pollock & Black, Kilmarnock, mason	£2,830 0 0
Allen & Cameron, Glasgow, joiner	1,550 3 5
J. Gillespie & Son, Paisley, slater	227 11 8
H. Shields, Largs, plumber	278 16 10
D. & J. Tait, Dalry, plasterer	169 9 6
A. Frazer, jun., Largs, smith	123 15 2
Meikle & Son, Glasgow, glazier	220 0 0
Buchan & M'Intyre, Glasgow, ironmongery	73 16 3
A. & J. Scott, Glasgow, painter	69 7 0
Heating Apparatus.	
Murdock & Cameron, Glasgow	184 19 5
Rolled Iron Beams and Iron Castings.	
P. & W. M'Lellan, Glasgow	250 14 7
Stair Railing.	
Manson & Sons, Glasgow	70 7 1
Gasfittings.	
J. & D. Willie, Largs	97 10 0
Concrete Work and Granolithic Pavement.	
D. & J. Mackenzie, Glasgow	161 13 5
Tile Linings.	
J. W. Mackie, Glasgow	82 2 9

LEWISHAM.

For Formation of Devonshire Road, Rosenthal Estate, Lewisham, and Sewer, for Mr. W. Guy Essell. Mr. H. A. ALEXANDER, Architect and Surveyor, 72 Cannon Street, E.C.

Adams	£978 0 0
Botterill	917 0 0
Catley	889 0 0
Rackham & Bentham	788 0 0
Mayo	785 0 0
Wilson	784 0 0
Barlow & Roberts	731 0 0
Warner	730 0 0
Hall	720 0 0
Parry	720 0 0
Osenton	713 0 0
Fletcher	675 0 0
Bell	667 0 0
Woodham & Fry	645 0 0

"SPHINX" PORTLAND CEMENT



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1¼ inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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"Model Dwelling," Newcastle Exhibition, 1887.



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Suffolk House, Laurence Pountney Hill, E.C.

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OLD BROAD STREET, LONDON, E.C.

MANSFIELD STONE,

FROM THE "LINDLEY" QUARRIE

MANSFIELD.

LEWISHAM—*continued.*

For Finishing Terrace of Five Houses, Lewisham. Mr. H. Percy Monckton, Architect, F.R.I.B.A., 32 Walbrook, E.C.

Robson	£560 0 0
Barnwell	374 0 0
Tattersall	308 0 0
Bryant (*accepted*)	301 0 0

LONDON.

For Alterations and a New Wing to Existing Buildings, North End House, West Kensington, for Mr. J. S. Scott. Mr. G. Gordon Stanham, Architect and Surveyor, 100B Queen Victoria Street. Quantities supplied.

Aviss & Co.	£2,800 0 0
Turtle & Appleton	2,732 0 0
W. Johnson & Co.	2,667 0 0
Holloway Bros.	2,660 0 0
Adamson & Son	2,649 0 0

For Alterations, Additions and Decorations at 23 Elvaston Place, South Kensington. Mr. J. W. Rhodes, Architect, 3 Clifford's Inn. Quantities by Mr. Charles J. Ford, 3 Clifford's Inn.

Bowden & Co.	£2,796 0 0
E. A. Wetton	2,700 0 0
Shillitoe & Son	2,340 0 0
T. Stevens, London (*accepted*)	2,249 0 0

For New Drainage, W.C.'s, &c., at St. Mark's School, Notting Hill. Mr. C. L. R. Tudor, Architect, 81 Lancaster Road, Notting Hill. Quantities by Mr. Charles J. Ford, 3 Clifford's Inn.

Tanner	£182 0 0
Inglish	155 0 0
Nash	129 0 0
H. & E. Lea, London (*accepted*)	124 0 0

For Repairs, Drainage, &c., at Nos. 5 and 7 Crescent Street, Notting Hill. Mr. C. L. R. Tudor, Architect. Quantities by Mr. Charles J. Ford, 3 Clifford's Inn.

Holloway Bros.	£437 0 0
Hollingsworth	394 0 0
H. & E. Lea	385 0 0
W. Nash	380 0 0
Floyd & Hayman, London (*accepted*)	365 0 0

LONDON—*continued.*

For Alterations to the Cambridge Music Hall, for Mr. W. Riley. Mr. Edward Clark, Architect.

R. Perkins	£685 0 0
J. Anley	673 0 0
Whitehead & Co.	645 0 0
J. Mills	643 0 0
Rowe Bros., Camden Town (*accepted*)	527 0 0

For Alterations and Addition to the Old School House, Swan Lane. Mr. H. Percy Monckton, F.R.I.B.A., Architect, 32 Walbrook.

Harrison & Spooner	£107 0 0
E. A. Roome (*accepted*)	74 0 0

For Erection of Two First Sections of Warehouses, White Lion Wharf, Upper Thames Street, for Messrs. O'Brien, Thomas & Co. Messrs. Hudson & Booth, Architects, 17 Godliman Street. Quantities by Mr. Henry Lovegrove, 26 Budge Row.

N. Lidstone	£14,185 0 0
Dove Bros.	12,745 0 0
Woodward & Co.	12,718 0 0
Treasure & Son, Shrewsbury	12,637 0 0
Jas. Greenwood & Son	12,489 0 0
E. Lawrence & Sons	12,422 0 0
Hall, Beddall & Co.	12,190 0 0
Holliday & Greenwood	12,100 0 0
Wm. Downs	11,910 0 0
F. & H. F. Higgs (*accepted*)	11,800 0 0

For Construction of Brick Culvert, Side Entrances, &c., at rear of Norman House, Hornsey, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer.

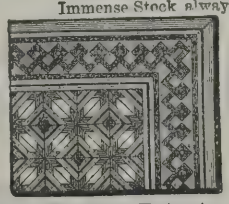
Thomas Adams, Kingsland	£1,154 9 2
T. G. Dunmore, Crouch End	864 10 0
B. Cooke & Co., Battersea	850 0 0
Willmott & Sons, Finsbury Park (*accepted*)	760 0 0

For Alterations at No. 152 Upper Thames Street, for Sir Francis Truscott. Mr. G. Gordon Stanham, Architect, 100B Queen Victoria Street.

J. W. Falkner	£179 0 0
J. Hoare & Son	165 0 0
H. Eydmann	140 0 0
J. Appleby	100 0 0

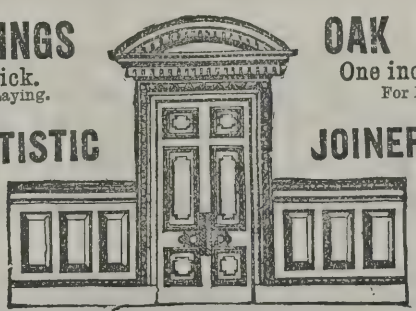
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LONDON—*continued.*

For Erection of Cottage Home at West Norwood. Mr. G. ASHBY LEAN, Architect and Surveyor, 8 Union Court, Old Broad Street.

J. & S. BOWYER (*accepted*)	£530 0 0

For Erection of New Factory and Warehouses on Site of Gay's Buildings, Hackney Road, for Mr. Henry Warden, 38 Noble Street. Messrs. BRUNSDEN & HENDERSON, Surveyors, 3 Barbican.

J. Veres & Co.	£2,999 0 0
Treasure & Son	2,997 0 0
E. Toms	2,846 0 0
Mattock Bros.	2,733 0 0
J. Steed	2,695 0 0
W. Shurmur	2,655 0 0
J. JARVIS & SONS (*accepted*)	2,545 0 0

LUSTLEIGH.

For Additions to School Buildings, for the Lustleigh School Board. Messrs. J. W. ROWELL & SON, Architects, Newton Abbot.

H. Phillips, Exeter	£279 3 0
Aggett & Underhill, Chagford	263 0 0
Blackmore & Wills, Moreton	230 0 0
Underhill & Wills, Moreton	224 15 0
J. Lambe, Lustleigh	210 0 0
Parker & Son, Lustleigh	210 0 0
RUNDLE BROS., Kingsbridge (*accepted*)	206 0 0
Wm. Mortimore, Lustleigh	205 17 0

NEWPORT.

For Building the Ship Hotel, Newport. Mr. E. A. LANSDOWNE, Architect, Newport, Mon.

	Contract 1.	Contract 2.
J. D. Williams, Knighton	£4,785 0 0	£3,435 0 0
Bowers & Co., Hereford	4,522 0 0	3,030 0 0
Price, Newport	4,348 0 0	2,747 0 0
Blackburne, Newport	4,299 0 0	2,797 0 0
Stephens & Bastow, Bristol	4,249 0 0	2,799 0 0
Lock, Newport	4,200 0 0	2,785 0 0
Richards, Newport	4,200 0 0	2,450 0 0
Jones & Son, Newport	4,100 0 0	2,390 0 0
J. Linton, Newport	3,900 0 0	2,250 0 0
Wyatt & Pitt, Newport	3,549 0 0	2,374 0 0

NEW TREDEGAR.

For Erection of Police Buildings, New Tredegar. Mr. WILLIAM TANNER, County Surveyor, Newport, Mon.

Osborne & Co., Aberdare	£1,671 0 0
J. Linton, Newport	1,630 0 0
T. G. Diamond, Newport	1,538 0 0
MOULTON & BROWNSCOMBE, Newport (*accepted*)	1,429 0 0

PAIGNTON.

For Building Master's Cottage Residence for the Paignton School Board. Mr. GEO. SOUDON BRIDGMAN, M.S.A., Architect, Torquay and Paignton. Quantities by Architect.

H. Webber	£474 0 0
G. Webber	471 0 0
E. Westlake	449 10 0
F. Vanstone	449 0 0
C. & R. E. Drew	449 0 0
Rabbich & Brown	412 0 0

For Building Stables and Conservatory at Roundham Mansions Paignton, for Mr. J. F. Belfield. Mr. GEO. SOUDON BRIDGMAN, M.S.A., Architect, Torquay and Paignton.

H. WEBBER, Paignton (*accepted*)	£444 0 0

PETERBOROUGH.

For Building Dwelling-house, &c., Peterborough, for Mr. Rose. Mr. J. G. STALLEBRASS, Architect, North Street, Peterborough.

W. Jellings, Peterborough	£190 0 0
R. Noble, Peterborough	187 12 0
J. T. Machin, Peterborough	182 10 0
J. T. Spencer, Peterborough	180 0 0
W. Sibley, Peterborough	180 0 0
J. Wenlock, Peterborough	179 16 0
R. Wright, Peterborough	175 0 0
T. Bailey, Peterborough	175 0 0
D. Gray, Peterborough	175 0 0
J. Nichols, Peterborough	169 13 0
J. Guttridge, Peterborough	167 0 0
T. Kidd, Peterborough	165 0 0
J. SHARPE, Peterborough (*accepted*)	165 0 0



PLYMOUTH.

For New Lavatory and Alterations to Vestry, St. Luke's Church, Plymouth. Mr. Jas. Harvey, M.S.A., Architect, Bedford Chambers, Plymouth.

C. H. Coles, Plymouth	£49 0 0
A. N. Coles, Plymouth	40 0 0
W. T. Bone, Plymouth	39 8 0

PONTYPOOL.

For Building Police Superintendent's Residence at Pontypool. Mr. William Tanner, County Surveyor, Newport, Mon.

T. G. Diamond, Newport	£985 0 0
J. Linton, Newport	950 0 0
M. Brownscombe, Newport	923 0 0
Morgan & Evans, Pontnewynynydd	902 0 0
J. Burgoyne & Son, Pontypool (*accepted*)	850 0 0

SEVENOAKS.

For Additions to Stabling at Ightham Park, Sevenoaks. Mr. H. Percy Monckton, F.R.I.B.A., Architect, 32 Walbrook, E.C.

Allcorn & Son	£259 17 0
Iggulden	230 0 0
Avard	228 0 0
Semark (*accepted*)	215 0 0

STARCROSS.

For Erection of New Workshop Buildings and Dormitories at the Western Counties Idiot Asylum, Starcross. Messrs. J. H. Rowell & Son, Architects, Newton Abbot.

Luscombe & Son, Exeter	£1,900 0 0
Tree & Bolley, Exeter	1,750 0 0
J. R. Gibbard, Exeter	1,721 0 0
H. Phillips, Exeter	1,580 0 0
N. Pratt, Clyst St. Mary	1,573 0 0
E. Andrews, Teignmouth	1,557 13 11
F. A. Stacey, Newton Abbot	1,495 0 0
W. H. Gooding, Exeter	1,455 0 0
J. L. & H. Steer, Clyst St. George (*accepted*)	1,450 15 0

SUTTON.

For Alterations and Additions to Stambourne, Sutton, Surrey. Mr. G. Ashby Lean, Architect and Surveyor, 8 Union Court, Old Broad Street, E.C.

Potter	£633 0 0
Humphries	612 0 0
J. & S. Bowyer	512 0 0

ST. LEONARDS-ON-SEA.

For Additions and Alterations to Mostyn Villa, Ellenslea Road. Messrs. Gant & Slatter, Architects, Havelock Road, Hastings.

A. H. White, St. Leonards (*accepted*)	£398 18 0

SWANSEA.

For Erection of Parsonage House, for St. Gabriel's Parish, Swansea. Mr. H. C. Portsmouth, Architect, Swansea. Quantities by Architect.

J. D. Williams, Knighton	£1,985 0 0
C. Walters, Swansea	1,940 0 0
T. Richards, Swansea	1,893 15 0
Jenkins Bros., Swansea	1,845 0 0
H. Billings, Swansea	1,750 0 0
Bennett Bros., Swansea (*accepted*)	1,700 0 0

WAINSTALLS.

For Erection of Four Houses at Lower Slack. Mr. T. L. Patchett, Architect, Halifax.

Accepted Tenders.

Thos. Pickles, Midgley, excavator, mason and bricklayer.
Edwin Marsland, Booth, near Luddenden, carpenter and joiner.
Jonathan Calvert, Booth, near Luddenden, plumber and glazier.
S. Barrett & Son, Pellon, near Halifax, slater and plasterer.

WATFORD.

For Painting, &c., at the Leavesden Asylum, Watford, Herts, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

V. Inwood	£2,641 0 0
Vigor & Co.	2,390 0 0
H. G. Marchant	2,361 0 0
Rowe Bros.	2,100 0 0
E. J. Hurley	2,002 13 7
H. Fullagar	2,000 0 0
W. G. Lilly	1,987 0 0
W. F. Hadlow	1,882 0 0
Akers & Co.	1,533 0 0
M. Batchelor, Maidstone (*accepted*)	1,334 0 0

WEST BROMWICH.

For Building Lodge and Reading-room, Greet's Green, West Bromwich. Mr. Alfred Long, Architect.

Charles Davis, Wolverhampton (*accepted*)	£544 0 0

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Estimates given for Experimental Work of all kinds on application.

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WHEATLEY.

For Erection of Dwelling-house and Outbuildings, Wheatley, near Exeter, for Mr. Antony Gibbs. Messrs. T. W. ROWELL & SON, Architects, Newton Abbot.

Luscombe & Son, Exeter	£1,725	0	0
J. R. Gibbard, Exeter	1,397	0	0
H. Phillips, Exeter	1,306	0	0
Tree & Bolley, Exeter	1,297	0	0
N. Pratt, Clyst St. Mary	1,273	0	0
W. H. Gooding, Exeter	1,212	0	0
J. L. & H. STEER, Clyst St. George (*accepted*)	1,196	11	0

TRADE NOTES.

NEW Board Schools have been erected at Newport, Mon., and the most careful consideration has been given to the ventilation, which has been carried out by the "Climax" Ventilating Company, of 15 Great George Street, Westminster, their direct-acting turret ventilators being used for the extraction of the vitiated air and fresh air admitted by their improved air-inlets. The "Climax" Ventilating Company have received a letter from Mr. Howell, in which he says, "I have pleasure in certifying that your system of ventilation has given me complete satisfaction, and I shall readily recommend it to others."

THE friends of the late Mr. J. F. Swinburne, J.P., have lately placed a memorial tablet in Acocks Green Church, near Birmingham. The work is carried out in carefully-selected Derbyshire alabaster, and the details are of the most delicate character. The framework is elaborately canopied and crocketted, rising from a richly ornamental mould which serves as the base, while at each side of the tablet proper are canopied niches enclosing figures of angels in full relief. The upper portion is divided into five canopies, the centre one, which is surmounted by a cross, being higher than the others. Immediately under this the arms and crest of the deceased gentleman form a centre for the inscription, which is deeply carved into the surface. The work has been carried out by Messrs. Jones & Willis, of Birmingham and London.

TWELVE clerestory windows are now being completed by Messrs. Charles Bussell, Gibbs & Co., of Wells Street, W., for shipment for the council chamber of the new Municipal Buildings, Bombay. The design is geometrical, with rich borders and foliated ornament in the head, while in the centre are medallions with shields bearing the city arms. The firm has already sent out a large four-light bay window, also for the council chamber; each light is divided by stone mullions with three panels, the heads of which are of rich foliated design, with corresponding borders, and in the centre of the top and bottom panels are medallions with shields bearing heraldic designs, taken from the arms of the Corporation, while in the centre panels are shields with the full city arms and motto, "Urbs primis in Indus," with supporters on either side. In the tracery above the city arms are repeated, the whole forming a very rich window, specially designed for the strong light to which it will be subjected. In addition to this they have also sent a number of small panels, some three thousand of quarry rondel glass for tympani of doors to the various offices in the building, and at present have in hand a large quantity of tracery for towers, arcades and entrances in various rich foliated and heraldic designs.

WITHIN the last few weeks the wood pavement has been removed from the carriageways of King Edward Street, E.C., Billiter Street (part of), Aldgate (part of), and St. James Place, S.W., and these streets are now paved with compressed asphalte, the material used in each case being that of the French Asphalte Company.

THE ratepayers of Skipton have rejected a proposal of the Local Board to apply for power to borrow the sum of 40,000*l.* to carry out a scheme of water supply. This is the second scheme which has now been rejected.

A NEW peal of tubular bells has been erected in the steeple of St. Giles's Cathedral, Edinburgh. The previous peal of these bells, supplied by Messrs. Harrington, Latham & Co., Coventry, were found to be too light for the position in which they were placed in the middle of the city, and this peal, from the works of the same firm, are altogether of a heavier type, and have a deeper note. It consists of thirteen bells, attuned in the key of A flat. The largest tube weighs about 3 cwt., and is 9 feet 3 inches in length and 4¼ inches in diameter. The smallest of the tubes weighs about 70 lbs., and is 5 feet in length and 3 inches in diameter. The largest hammer weighs 12 lbs. and the smallest 7 lbs.

THE new harbour works at Thurso, for which an Act was obtained in 1889, are making good progress. In 1890 a contract was entered into with Mr. Mackay, and by that contract the works have to be finished within two years from November last. These works will include a pier 825 feet in length along

H. W. COOPER & COMPANY, LIMITED.

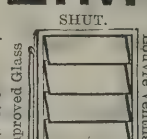
HEALTH EXHIBITION. MEDAL AWARDED, 1884.



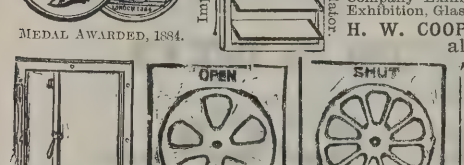
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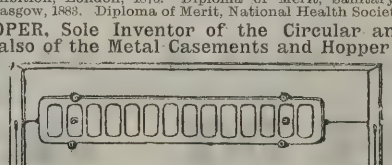
H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.



GLASS SELLERS' COMPANY EXHIBITION, MEDAL AWARDED, 1876.

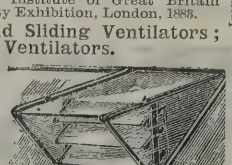


Improved Casement. Circular Glass Revolving Ventilator.

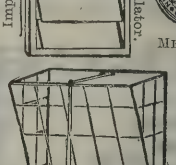


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the river, and a retaining wall which will enclose several acres of what is now beach, but which is to be reclaimed. On the opposite or Thurso east side a short wall or groyne will jut into the river, and it is expected that by this means the river, which the contractor has to deepen to the extent of 4 feet at low water in ordinary spring tides, will scour itself. The present is the third attempt that has been made to secure a harbour for the town.

THE Hampstead Vestry has resolved to apply to the Board of Trade for a provisional order authorising it to introduce electric lighting for public and private purposes into the borough of Hampstead.

THE firm of C. Carr, Smethwick, have secured the contract to recast the fourth bell, weight about 8 cwt., and to rehang the whole of the peal of six bells at Old Swinford Church, near Stourbridge.

A LITTLE above Kirkham Abbey stands the beautiful church of Whitwell, near York, which has been further enriched by a clock striking the hours, given by Mrs. Egerton, Whitwell Hall. The clock was made and erected by W. Potts & Sons, of Leeds.

THE electric light is being introduced into the public works in Fife. Messrs. W. Livingstone & Sons, Leslie, have their spinning mills and bleachfields illuminated by the electric current, and preparations are being made by Mr. C. Anderson, of Fettykill, to have his paper mills lighted in the same way. Mr. Anderson has offered to share the benefits of the new light with the villagers.

NOTES ON NOVELTIES.

Domestic Electric Pump.—Messrs. Merryweather & Sons have working at their establishment in Long Acre a small pump, suitable to supplying house-tanks in country districts, where there is neither gravity nor machinery for pumping. It consists of a rotary pump, driven by screw-gearing direct from an electric motor, which is influenced by a primary battery fitted in the cellar. The pump and motor do not weigh more than 25 lbs., and occupy a space of a foot square. It is certainly a novelty, and in its way will throw quite a powerful little jet, equal to a London Brigade hand-pump, for fire extinguishing. Messrs. Merryweather ask us to notify to architects and those generally interested, that they may see the pump in operation at any time.

BUILDING AND BUILDERS.

NEW premises are to be built at Willenhall for the Birmingham and Metropolitan Banking Company. The plans have been prepared by Mr. B. Baker, town surveyor.

AT the meeting of the Glasgow Dean of Guild Court permission was granted to the Scottish Co-operative Wholesale Society, Limited, to erect a warehouse and stores in Crookston Street; to A. G. Marshall, to erect eight tenements of dwelling-houses, four storeys in height, in Westmoreland Street: and to Thomas Hinshelwood & Co., chemical manufacturers, to erect buildings in Glenpark Street.

AT the meeting of the Stafford Board of Guardians the Board had under consideration the proposed new buildings and alterations at the workhouse, to include new infirmary, dining-room, chapel, porter's lodge, &c. A committee had recommended the enlargement as proposed, and also that 4,000*l.* should be borrowed to enable it to be carried out. It was eventually decided that the building of a chapel was unnecessary, and that the necessities of the case would be met by the extension of the dining-room and the erection of a hospital. An enlarged committee was appointed to report on the scheme.

PLANS for building a chapel at Glenboig, in connection with the parish church of New Monkland, have been approved of.

AT a preliminary public meeting held in Stourbridge, a committee was appointed in furtherance of a projected scheme to establish a cottage hospital.

AT the meeting of the Worcester Board of Guardians, the Building and Property Committee presented a report from Messrs. Rowe & Sons, architects, on the proposed school buildings, showing where reductions might be effected in the event of the children of the workhouse being educated in the parochial or Board schools. It was resolved that the modifications in the plan, whereby a reduction will be effected in the cost of the erection of about 1,000*l.*, should be adopted.

PLANS for proposed alterations to the workhouse at Hollingbourne, at a cost of about 1,000*l.*, have been prepared by Mr. F. W. Ruck, county surveyor, Maidstone.

THE work of restoring the parish church, Winfarthing, has been placed in the hands of Mr. Ward, of Diss. The two north windows in the nave are completed, and the workmen are at present engaged on the west window in the south aisle. The

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windows are being thoroughly restored, and the defective portions of the mullions, tracings and sills are being replaced.

AT Erith the erection of buildings has been begun for Messrs. Fraser & Chalmers, marine engineers, who are also the proprietors of very extensive works at Chicago. The works when completed will afford employment to a large number of hands.

PLANS prepared by Mr. Morham, city superintendent of works, have been passed by the Edinburgh Dean of Guild Court. It is proposed to utilise the house No. 2, the upper storey to be used as a residence for the superintendent, and the lower part altered to suit the requirements of the station itself. The lower storey is to have a new front. It will be ornamental in character, cut into bays by rusticated pilasters, and having its doorways and windows circular-headed, with moulded archivolts. The cost is estimated at 2,500*l.*

IT has been decided that Mr. John Murdoch, C.E., Ayr, should carry out the work of building a new river wall in South Harbour Street, Ayr. The wall will extend from the New Bridge to a point opposite the Queen's Hotel.

THE newly built tower of a church at Pörtschach, on the shores of the Wörther See, in Carinthia, on Sunday fell with a crash.

SEWAGE DISPOSAL.

IN the Chemical Section of the meeting of the British Association at Cardiff, Mr. C. G. Moor read a paper on "A New Method for the Disposal of Sewage, with some references to schemes now in use." The author remarked that at the recent Congress on Hygiene and Demography, Dr. Thresh asked, with reference to sewage treatment, if any of the processes mentioned enabled them to get rid of their sewage in such a way as to give rise to no nuisance and cause no danger to health, at a cost sufficiently reasonable, considering the importance of attaining such results. In the opinion of most experts of the present day the only answer was a direct negative. That could be seen from a brief consideration of the methods now in use—lime processes, other than lime processes, and irrigation. In the first of the three a good effluent was the only thing aimed at, as the sludge was worthless. In the second, the sewage matter was precipitated by various preparations, and the deposit of sludge was often of some value as manure, whilst there was also an electrical treatment. With regard to irrigation, that might be adopted with success where land was suitable and cheap, but it was a disputed point as to whether parasites might not be communicated to the animals feeding from the crops raised off unfiltered sewage, and it was certainly not advisable to irrigate fields with untreated sewage so that pools of putrifying matter were formed, round which cattle were feeding. The treatment referred to in the title of the paper had been practically tested at experimental works at Leyton. He had no very novel suggestions as to the precipitation of sewage, the originality of his method depending on the manner in which the sludge cake, produced by any precipitation process, might be converted into marketable products. Sludge cake consisted, roughly speaking, of 25 parts water; 20 parts inorganic matter, containing phosphates; and 55 parts combustible matter, containing nitrogen. If they could afford to distil the coke in gas-retorts they would save the ammonia, but it would not pay to do that unless it was very rich in ammonia, and then it would be saleable without further treatment. There was, however, a cheaper way of distillation in a patent obtained some years ago by Mr. Rees Reece, in which a kind of lime-kiln with a forced draught, connected with a series of condensers, was used. He had used the same method and had experimented on a sufficiently large scale to show the possibility of practical working. The sludge gave ample heat for its own distillation, and might also be used to raise steam in the same furnace if desired. Eighty per cent. of ammonia was what he actually obtained, and probably more could be obtained with better apparatus. The low value of the ash, which contained about 60 per cent. of calcinna salts, was due to the addition of the lime for precipitation and pressing. The lime also produced clinkers in the furnace when at the temperature at which point inflammable gas is produced. Where clinkers could be used that might be done, and the ammonia alone relied on as a source of income. The uncondensed gases, having an unpleasant smell, must be burnt to avoid a nuisance. What was wanted was to produce a sludge cake rich in ammonia and phosphate, without adding precipitants in such a quantity as to lower the percentage of phosphate in the ash. The use of lime ought to be avoided at all costs, and he should be inclined to try carbonised sludge in powder mixed with salts of alumina and iron, and after precipitation running the liquid through a bed of lumps of carbonised sludge, which could be burnt when foul. It seemed probable that by using a sufficient quantity of that carbonaceous material (which could be so

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Nancy
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Red as a Rose is She
Second Thoughts
Belinda
"Doctor Cupid"
Alas!

By Mrs. ALEXANDER
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Her Dearest Foe
Look Before you Leap
The Executor
Which Shall it Be?

By ANTHONY TROLLOPE
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By MARCUS CLARKE
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By ROSA N. CAREY
Nellie's Memories
Barbara Heathcote's Trial
Heriot's Choice
Not Like other Girls
Only the Governess
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Robert Ord's Atonement
Uncle Max | Wee Wifie
Wooed and Married
Mary St. John. [*In the Press*]

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Miss Shafto
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Leah: a Woman of Fashion
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By Mrs. AUGUSTUS CRAVEN
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Thelma
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By MARY LINSKILL
Between the Heather and the Northern Sea

By E. WERNER
Under a Charm
No Surrender
Success and how he won it
Fickle Fortune

By J. SHERIDAN LE FANU
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In a Glass Darkly
The House by the Churchyard

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Borderland
Healey
Kith and Kin
Probation
Aldyth

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Sir Charles Danvers

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Too Strange Not to be True

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The Parting of the Ways

London: RICHARD BENTLEY & SON, New Burlington Street, Publishers in Ordinary to Her Majesty the Queen.

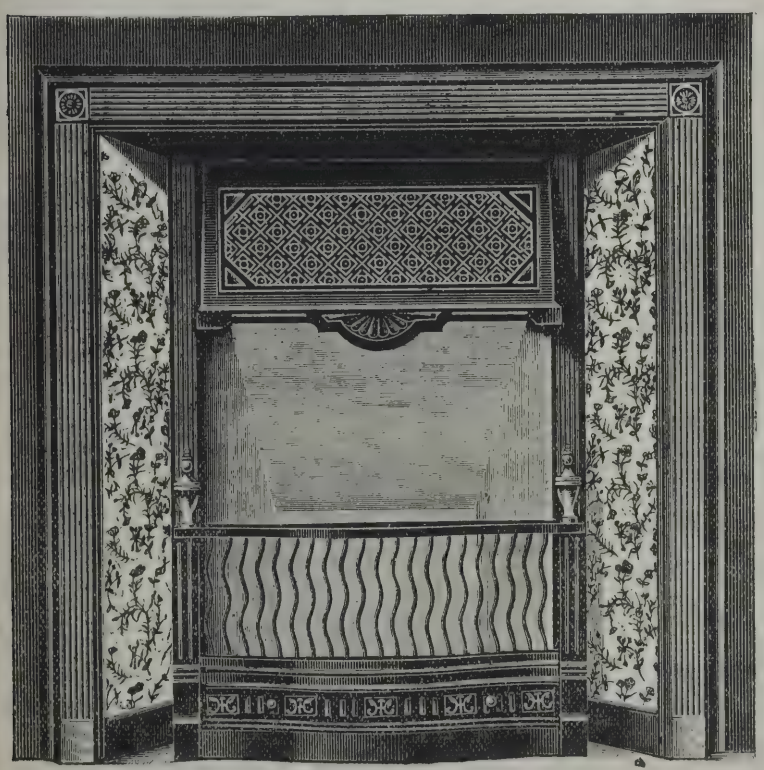
readily renewed) a considerable degree of purity could be arrived at in the effluent. At the present day it was fast becoming widely felt that it was the duty of towns to treat their sewage in some way so that no injury might be caused to health, but yet they ought not to rest content with processes that yielded nothing but refuse. It was now many years since Liebig insisted on the need of maintaining a proper circulation of phosphates and ammonia if they wished their land to remain fertile, and that need, instead of diminishing, showed itself more clearly every day.

NEW CATALOGUES.

WE have received from Messrs. T. & R. Boote, of Burslem, their catalogue for 1891 which has just been issued. The catalogue illustrates in colour the tiles for floors, the tiles for walls manufactured by Messrs. T. & R. Boote, and in addition hearth titles and also glazed dado and wall-tiling. The patterns, besides showing the colour, have the advantage of being shown as portions of flooring, walling, &c., complete with border, from which a good judgment can be formed of the appearance of the tiling *en masse*. Rich and effective floors will be found in consulting plates Nos. 102, 103 and 104, the new colours and combinations being very pleasing. Nos. 608 and 609 on Plate 100 will be likely to find favour, while the treatment and colouring is quite original. They are singularly inexpensive. About twenty-five plates, each containing several designs, are included in the catalogue, the scale adopted being from $\frac{3}{4}$ inch and 1 inch to a foot. Among so many designs for tilework it is rare the standard of excellence in design and colouring is so well sustained from first to last. In some introductory and explanatory remarks Messrs. Boote state that in ordering tiles from the book it is necessary only to mention the number of the pattern, and they particularly request that the book be not mutilated, as any single sheet required will be supplied on application. Special designs also will be prepared if necessary or when desired, in order to meet any particular requirement of a purchaser. Estimates for tiles fixed complete are furnished if required, but to be done satisfactorily a plan of floor should be sent, with accurate measurements marked in figures in preference to being drawn to scale. Another point which it is always well to bear in mind in these days is that when clients intend to give an order to a manufacturer they should, as far as possible, give ample time to insure the satisfactory completion of the order.

THE great revolution that has taken place during the last twenty or thirty years in the improved construction of open fireplaces, is strikingly shown in the illustrated price-list of slow combustion stoves manufactured by Messrs. Barnard, Bishop & Barnards, Limited, of the Norfolk Iron Works, Norwich. During these past years attention has been called by professional men and experts on many occasions to the old-fashioned mode of burning coal as a system wasteful of fuel and also of heat, and which is likewise fruitful in the production of the smoke which contaminates the air of our towns, and which, except when all circumstances are favourable, often finds its way to the outside of the house through other outlets than the chimney. Thanks to the slow combustion stoves, no one need now suffer from smoky chimneys. These stoves, as should be well known by this time, consume fuel on a most economical scale, the combustion being what is called slow, but which, strictly speaking, is a natural or normal condition of combustion in place of the old style, which is better named conflagration of fuel. It also follows that there is comparatively little smoke emitted; the whole of the heat capable of extraction is developed and utilised, and a perfect consumption of fuel effected. Any persons who have tried these stoves will doubtless agree that Messrs. Barnard, Bishop & Barnards are warranted in claiming the advantages they enumerate for their slow combustion stoves. Among these advantages it may be stated that the fire once alight can be left to itself for hours, the stoves maintain an equable temperature without producing stuffiness, and coal of any kind, anthracite, coke, wood or peat can be used in them. Over a hundred pages are devoted to the stoves, which are of all kinds, sizes and styles, to suit all purposes and all requirements. In addition, great attention has been devoted to production of an artistic framework for the house fires, whether looked for in the illustrations of the unfixed stove, or in those which show also mantel and overmantel complete. It is needless to say that the most elaborate stove is only more valuable than the plainest in regard of cost of production, the real worth of any one being in the efficiency and other virtues that secure cleanliness, healthfulness, &c. We shall not attempt to refer in detail to the varieties shown in the catalogue. The latest novelties among them, however, are the Osborne and the Norfolk patent stove. The Osborne has been introduced as an improvement upon the slow combustion stove now so well known to the public. The firebrick projecting into the room acts as a great radiator of heat. The fire always burns brightly in this arrangement, the small quantity of ashes

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No. 315—Register.

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BRICK BACK, AND BARS.

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Ironfounder,

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LONDON, E.C.

PATENT No. 2496. A.D. 1884.

dropping on the brick, from which it is easily removed or replaced upon the fire. It is also specially adapted for use in hospitals, sick rooms, &c., and will supply a want long felt by attendants on invalids, the projecting brick enabling any utensil to be kept at any required temperature, for use at any time, and such utensil can be left without fear of contents boiling away, or being spoiled through too great a heat. The Norfolk stove is constructed on slow combustion principles, but is so arranged that air can be admitted from below if a more rapid combustion is required. It is also provided with a patent arrangement for consuming as far as possible the smoke it produces. On referring to the catalogue, it will be seen by the illustration to have a perforated firebrick bottom. This is encased in an iron tray, and is provided with a "hit-and-miss" ventilator, by means of which the draught can be regulated. A novel patent arrangement of fluted and circular back bricks project into and overhang the fire. The back firebrick is made in two parts, a lower vertical portion and an upper projecting part. It becomes highly heated, and consumes the greater portion of the smoke which would otherwise escape by the chimney. The side bricks are placed at an angle, and are so arranged that the whole of the heat is radiated into the room. For the rest, we must leave our readers to glance over the catalogue for themselves, in surety that they will find what will suit their purpose, practically and also artistically. Regarded alone as ornamental metalwork, the higher class stoves will give every satisfaction, while those who require tile decoration will do well to consult the supplementary list of ornamental tiles stocked by Messrs. Barnard, Bishop & Barnards for the decorative treatment of the stoves.

MUNICIPAL WORK IN BIRMINGHAM.

THE report of the city surveyor, Mr. W. S. Till, upon the work of his department states that the length of public sewers constructed in accordance with the general system, either in declared highways or underneath private lands, up to December 31, 1889, was 202 miles 5 furlongs 98 yards. The length of sewers constructed by the Council between January 1, 1890, and March 31, 1891, was 1 mile 3 furlongs 216 yards, which, after deducting a small length for sewers taken up in Duchess Road and part of Latimer Street South, make the total length under charge of the Council on March 31 last 207 miles 1 furlong 207 yards. After considerable negotiation with the Smethwick authorities it has been arranged that for the period of twelve months from March 25, 1891, they shall pay the Corporation after the rate of 3*d.* per head per annum of the population of one-half of the district to be drained through the city sewers, and from March 25, 1892, the same rate shall be paid in respect of the whole area to be drained through the said sewers. The number of private drains laid into the sewers between December 31, 1890, and March 31, 1891, was 580.

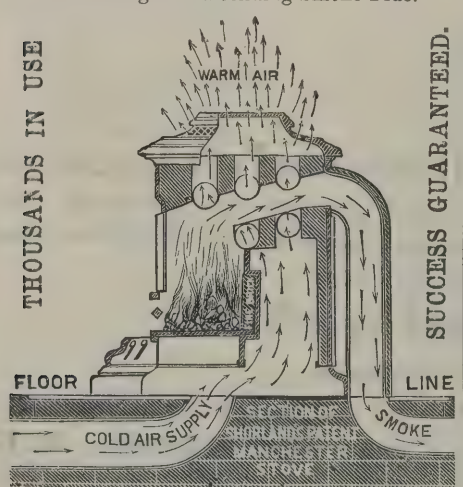
The manager of the sewage farm reports that during the fifteen months ending March 31 last the quantity of mud intercepted in the subsiding tanks at Saltley was 267,101 cubic yards, of which 250,878 cubic yards were in the roughing and 16,223 cubic yards in the smaller tanks, giving an average of 587 cubic yards per day, as against 396 cubic yards per day in 1889, and that the quantity of land used for digging in the mud was 59 acres, against 41¼ acres in 1889, whilst the quantity of lime used for precipitating purposes was 4,268½ tons, or an average of 9 tons 7 cwt. 2½ qrs. per day.

During the period covered by the report wood pavement was substituted for macadam in Temple Row, Temple Row West, the Minories, Saint Martin's Lane, in that part of Corporation Street lying between Newton Street and Lancaster Street, parts of Stephenson Street, John Bright Street, Station Street, Hurst Street, Rea Street South and Floodgate Street, and an agreement has been entered into with the Improved Wood Pavement Company as to the maintenance of such pavements. Granite pavement has also been substituted for macadam in Great Barr Street between Montague Street and Lawley Street, Watery Lane, Pitney Street, Macdonald Street, Mill Street, Loveday Street, and parts of Floodgate Street, Rea Street, Rea Street South, Hurst Street, Lower Hurst Street and Spring Hill. Considerable quantities of new flagging have been substituted for old, as also of other footway pavements. The length of declared highways in 1889 was 196 miles 4 furlongs 174 yards. The length of streets declared highways from January 1, 1890, to March 31, 1891, was 3 miles 3 furlongs 212 yards. The total length of streets and roads in the city is now 205 miles 83 yards.

No new tramways have been constructed, but on July 16 1890, the Bristol Road route was again inspected by the Board of Trade, and opened for traffic with electric accumulator cars on the 24th of that month. As the tramway in Navigation Street had been laid without Parliamentary powers, the company, after using the same for a time, were advised that there were serious

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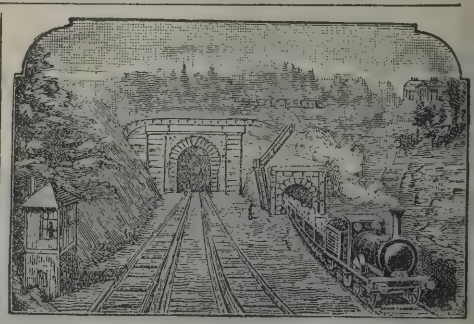
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objections to their carrying passengers over it, and therefore, with the consent of the Public Works Committee, they are promoting a provisional order in the current session to authorise its use for public traffic. Pending the passage of this order, the committee agreed to a short extension of the lines in Suffolk Street, between Navigation Street and Allport Street, with a cross-over road, which could be used as a terminus, until such time as the lines in Navigation Street could be legally used for traffic. The construction of this extension in Suffolk Street was commenced in December and opened for regular use on February 18 last. The cost of repairs and maintenance of tramway routes has been rapidly increasing, and for 1890 the sums were:—Aston, 919*l.* 19*s.*; Midland, 830*l.* 1*s.* 10*d.*; Central, 5,022*l.* 3*s.* 5*d.*; Western districts, 15*l.* 8*s.* The stone purchased for repairing the macadamised carriage-ways from January 1, 1890, to March 31, 1891, amounted to 23,498 tons, in addition to 11,912 cubic yards of gravel pebbles and grit. The quantity of water used on the roads and in flushing sewers during the year 1890 and the first quarter of 1891 was 173,656 loads, or 59,711,250 gallons; 14,176,980 gallons included in the above were used for flushing sewers. This quantity is nearly double that used in 1889 for the same purpose, and is 7,886,916 gallons above the average of the preceding five years, and is at the rate of 45,585 gallons for every working day during the year. The total quantity used in 1890 was 7,214,920 gallons more than in 1889, and 7,006,820 gallons above the preceding five years' average. Three new flushing machines, holding respectively 330, 450 and 1,800 gallons, have been added to plant during 1890. The total number of lamps under the control of the Public Works Committee on March 31, 1891, was 7,558, and the cost of maintaining the same for the preceding fifteen months was 16,370*l.* 9*s.* 10*d.* In accordance with the instructions of the Council, some progress has been made in the matter of the lighting of the courts. The necessary plans, estimates and provisional apportionments have been prepared, and the notices served on the owners of some 440 courts requiring them to provide the means of lighting. The number of lamps in courts lighted, cleaned and extinguished by the department is 361. The number of horses belonging to the Public Works and Health Departments on March 31, 1891, was —Public Works, 93, valued at 3,951*l.*, and Health Department, 154, valued at 6,217*l.* The number of men employed in the Public Works Department on March 31 last was as under:—Officers (clerks, surveyors, &c.), 29; repairing, cleansing, paving, flagging, &c., streets and roads, 419; stone-breaking, 60; flushing, cleansing and repairing sewers, 34; repairing carts and tools, painting, &c., 11; lighting, &c., public lamps, 172; stablemen, 33; total, 758.

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The following instructions have been issued by the Continental Fire Insurance Company of New York.

Walls.—The walls must be of the best construction, of standard thickness, as specified below, and not reduced by flues or for any other purpose. The walls must be corbelled out to receive the floor, unless a ledge is made by reason of the wall receding to a smaller dimension. Thickness of walls must be as follows:—The upper two storeys next to the roof, 13 inches; the next two below, 18 inches; the next two below, 22 inches; the next two below, 26 inches; the next two below, 30 inches. Party-walls must be 4 inches thicker than the above on all storeys except the storey next to the roof, or be ledged or be corbelled. Parapet or fire-walls to pass at least 24 inches above the roof. Walls over 100 feet in length must be 4 inches thicker than the standard thickness, unless there are cross-walls of equal height, or solid buttresses with a section area of 300 or more square inches, placed not more than 18 feet apart and extending to the top of the wall. Flues, if any, must have walls not less than 8 inches thick, well laid in mortar and pointed and of sufficient area for the service required. No beam or woodwork to enter the wall within 18 inches of the interior of any flue. Chimney-tops must not be less than 4 feet above the roof.

N.B.—Unless the sand used in making mortar is good sharp sand, cement mortar should be used. This is very necessary in many sections of the country where both sand and bricks are of inferior quality. Cement mortar is, of course, preferable in any section and under any circumstances.

Columns, Girders and Beams.—The wooden columns, girders and beams should be of such dimensions as to easily bear their respective strains after allowing 1½ inches for charring on all exposed sides, but in no case shall any one of their dimensions be less than 8 inches. They must be planed smooth on all surfaces which may be exposed to action by fire. Bore the cores of the columns one and one-half in diameter, and ventilate near the top and bottom by half-inch hole transversely through the column. Special provisions must be made at points which are liable to dry rot, to secure ventilation

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around the timbers. Beams, if of wood, should not be bolted through the walls but rest upon a plate in the wall, on the upper side of which is a transverse fin which fits into a groove across the under side of the beam, and firmly secured to it by wedges; the upper edge of the beam at the end should be rounded. Iron columns, girders and beams, where exposed, must be encased in a fireproof covering of terra-cotta or fire-clay. Wrought-iron, being more liable to rust than cast-iron, should not be covered with plaster of Paris or cement. Lime mortar will not rust the iron.

Floors.—Floors must be laid directly on the beams and girders without joists, and be of the following construction:—The under or heavy floor plank must be planed on the exposed surfaces, splined or tongued and grooved, and not less than the following dimensions:—For bays of 8 feet or under, 3 inches; bays of 10 feet or exceeding 8, 4 inches; bays 12 feet or exceeding 10, 6 inches; for bays over 12 feet, 8 inches in thickness; for long bays it is recommended that the floors be made of plank on edge fastened closely together, but no bay must be over 15 feet. The floors must be made waterproof by some approved material laid between the top and under flooring. If paper is used there must be a double thickness of rosin sized paper or roofing felt. Top floor to be hard wood, at least $\frac{7}{8}$ inch thick, tongued and grooved. All joints between the walls, columns and floors must be caulked or provided with some approved waterproof joint. The best construction requires a slight inclination of the floors to the water vents, which must be provided on all floors where the water can be carried either through the walls or down into drains. Openings in the floor for steam or other pipes must be protected by a section of larger pipe made watertight in the floor, and extending 3 inches above it. If it is necessary to make holes in the floors for belts or shafts, metal jackets must be carried through the floor extending 3 inches above it and be watertight.

Bulkheads.—Bulkheads must be constructed of heavy plank not less than 3 inches in thickness, and planed on all exposed surfaces.

Roof.—The roof must be constructed of heavy plank tongued and grooved or splined, and not less than 3 inches thick and dressed on the other side. Covered externally with metal, composition, slate, or tile. Openings, if any, to be standard.

Cornice.—Cornices must be of brick, stone, terra-cotta, or metal on metal brackets, bolted into the walls. There shall be no openings into the building or attachments to wood or ends of timbers.

Stairways and Elevators.—Stairways and elevators must be placed in a brick shaft, the walls of which must extend at least 24 inches above the roof of the building, and all openings into it must be protected by standard fire-doors, and have sills 3 inches above the floor. In cases where stairways cannot be placed in a brick shaft, or where they do not run through all the floors, they must be constructed as follows:—The entire stairway must be of incombustible material; at some portion of the stairway between each floor a standard fire-door must be provided, which shall be furnished with some self-closing device, and the portion above or below said door must be rendered air-tight by being closed in by brick, terra-cotta, concrete, or iron frame, with metal lathing plastered on both sides. The floor must be raised 3 inches around the head of such stairway to prevent water from going down the stairway.

Interior Finish.—All walls and partitions to be brick, tile, terra-cotta, or iron frame with iron lath and plastered. No wooden lath or furring will be allowed. Where wainscoting is used no hollow space is to be left behind it. Woodwork should not be painted or varnished. Fireproof paint for the underside of the floors and other woodwork may be used, but it is preferable not to paint the heavy woodwork until it has been up for some time.

Exterior Openings.—All openings exposed by other buildings within 40 feet must be covered above the first floor with standard shutters; when exposed by a special within 15 feet, the openings on first floor must also be provided with shutters. A standard fire-door or shutter for protecting openings as required should be constructed of pine or other soft wood (hard wood should never be used, as the charcoal of soft wood holds the nails better than that of hard wood) of two thicknesses of matched boards, at right angles to each other, or crossing diagonally, securely covered with IC tin, 14 by 20, on both sides and edges, with folded lap-joints, the nails for fastening the same being driven inside the lap. The hinges, bolts and latches should be secured or fastened to the door or shutter after the same has been covered with the tin. Sheet-iron should not be used as it is too heavy to allow of the lap or folded joint. In covering the woodwork the tin should be placed round the edge and folded down at the top and bottom of the side of the door, making a mitre in the folding. In a room having an atmosphere liable to rust the tin, "leaded" sheets should be used instead of "tinned" sheets. Instead of closing by hinges

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and latches, doors are preferably arranged so as to run on inclined slides placed overhead, the doors being suspended on each slide by means of suitable iron pulleys or trolleys. The pitch of the rails should be about 1½ inches to the foot. They may be secured open by a fusible metal link, which would yield to a rising temperature and close the door automatically, and should be about 3 inches larger than the opening covered, on all sides. Care should be taken to make them tight at the bottom, where there should be an iron or stone sill sufficiently close to the bottom of the door to prevent the passage of flame. If hinged doors are used they should shut into a rabbet in the masonry or into an iron frame rabbet, or may have a 3-inch lap outside of the opening in the wall. When the frame is of wood it should be as securely covered with tin as the door itself.

HULL VICTORIA CHILDRENS' HOSPITAL.

THE Victoria Hospital for poor sick children, of which we give a sketch, is situated in Park Street, Hull, and was opened on Wednesday, July 22, by the Marchioness of Salisbury. The principal entrance is from Park Street, and it opens into a spacious approach to the vestibule, on the right of which are the board and the matron's rooms, while on the left is a suite of rooms for the use of the house-surgeon. A glazed door on the west side leads to the corridor connecting the official department with the hospital proper and thence to garden entrance and suitable lavatory accommodation. The hall is well lighted, and there is direct communication with the convalescent room (37 feet by 16 feet), the matron's stores and the nurses' retiring-rooms. On the ground-floor a little distance to the rear of the building is the kitchen, with stores, scullery and servants' sitting-rooms. A noticeable feature is the disconnection of the laundry from the main building. Access is gained to it by a covered passage, through the kitchen department, from which also runs the staircase to the isolation ward. Ascending to the first-floor by a handsome stone staircase from the hall the principal ward (50 feet by 22 feet) is reached, containing sixteen beds, and having in close proximity bath-rooms, nurses' duty-room (with an inspection-window to the ward), service-hoist and linen store. Immediately at the head of the staircase are the matron's and nurses' sleeping apartments, and on the same landing the matron's office, central in its position, to allow of effectual supervision being exercised. Crossing the landing two wards facing Park Street are reached, one of which contains six beds and the other twelve, and which are separated by a nurses' duty-room, having the usual inspection-windows. A bath-room and linen-store are also placed near at hand. The ward on the second floor has accommodation for sixteen children, and possesses adjuncts similar in every respect to the ward below. Directly opposite is the lobby, by which access is gained to the ward for patients who may need to undergo operations, and close by is the operating-room, exceptionally well-lighted by side and top-lights. On this floor also is the isolation ward, but it is approached only from the ground floor by an enclosed stone staircase at the west end of the main



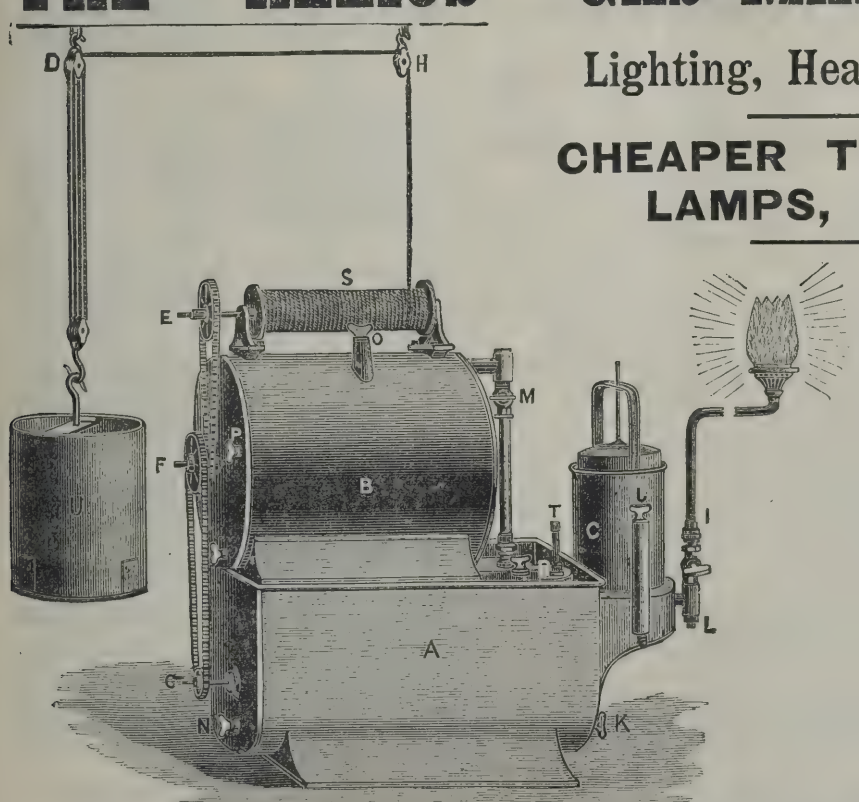
building, opening from the covered passage already alluded to. This ward has four beds, with bathroom and nurses' accommodation. All the wards have cleanly floors of pitch-pine, walls finished with Parian cement, and windows glazed with plate-glass. The two large ones are heated with central stoves with descending flues, the smaller being supplied by hygiastic grates. Beyond this, a supplementary system of hot-water pipes has been laid down for use in extreme weather, so that there will be little difficulty in keeping up an equal temperature. From Clarendon Street the outdoor department (which constitutes an entirely separate building) is approached. Here, as elsewhere, the arrangements are excellent. Consulting, examination and waiting-rooms, and a covered space for the perambulators, are conveniently arranged, while to the north of these the dispensary and drug-stores are situated, where also the greater part of the

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dispensing for the hospital wards will be done. This block, by the way, has a frontage of red brick and Ancaster stone dressings after the style of the Park Street elevation. In the rear are the post-mortem-room and mortuary. The Park Street elevation is in Gothic style, of an early French character, also built of red stock bricks and Ancaster stone dressings. The main building is, however, carried out in the plainest manner, with the strictest regard for economy. Mr. W. H. Bingley, Hull, with the late Mr. Musgrave, prepared the plan, under whose personal supervision the work has been carried out. Its total cost, including furnishing, is estimated at 7,500*l.* Messrs. George Jackson & Son, Hull, have been the contractors for the entire work, and Mr. J. Halcrow was engaged as clerk of works. The sub-contractors were Messrs. Dawber & Sons, slaters; Mr. G. Taylor, plumber; Mr. Watkin, painter; Messrs. Bradford & Co., Manchester, kitchen and laundry arrangements; and Messrs. King & Co., ironmongers.

THE PATENT SYSTEM.

A PAPER was read at the meeting of the British Association, on the 22nd inst., by Mr. Lewis Edmunds, D.Sc., on "The Taxation of Inventors." He said:—There are few classes of the community, in a manufacturing and industrial country like Great Britain, to whom the nation at large is more indebted for its prosperity than the inventors. It would, therefore, appear to be to the interest of the Government to offer every facility and encouragement to inventors, and with this object to afford them full opportunity for the acquisition and retention of property in their discoveries. But the contrary is the fact. There is no species of property which is so heavily pressed upon or so burdened with taxes as the very limited one which the law allows an inventor to acquire. Although distinctions may be drawn, the monopoly granted by a patent is in many respects of the same character as the copyright acquired by an author, and the word "copyright" might be almost equally well applied to the rights acquired by an author and by an inventor. But while the properties of an author and an inventor are very similar in their nature, the position of an author is immensely superior. He or his representatives hold the copyright for life and seven years after, or for forty-two years from the date of publication, whichever may be the longer term; and no fees of any kind are payable to the Government, except when for the purpose of securing rights in foreign countries, or of taking legal proceedings for an infringement, it is necessary to register the copyright at Stationers' Hall, in which case a small fee is demanded. There is no special taxation of authors of any kind, unless, indeed, we count as such the five copies which have to be presented to the British Museum and the University libraries, and this is a small matter. But an inventor is not so fortunate. By the nature of the case, he can only secure himself after complying with numerous formalities and making a full disclosure of what his invention is. This, of course, cannot be complained of. But even then the inventor obtains the monopoly of his invention for fourteen years only, and this is now subject, after the first four years of the term, to the payment of heavy annual fees, ranging from 10*l.* to 20*l.*, and amounting to 150*l.* in all. It is contended that these renewal fees are an unjustifiable tax upon inventors, and also that the preliminary fees payable at the Patent Office in connection with the application for the grant of the patent and the lodging of the specifications being 4*l.*, and quite sufficient to cover the whole of the office expenses, no further demand ought to be made by the Treasury. If it were proposed to put a tax of 10*l.* or more a year on every literary work, or else to abolish the copyright of the author, the suggestion would be scouted; yet inventors, with every claim to equality of treatment, are mulcted of these heavy fees or else lose their patent right. Under the recent Patents Act of 1883, the total expense of a patent running for the full term of fourteen years was reduced from 175*l.* to 154*l.*, but the whole abatement took place in the initial expenses, which were reduced from 25*l.* to 4*l.* What are now called "renewal fees" to the amount of 150*l.* are payable as before, either in amounts of 50*l.* and 100*l.* before the end of the fourth and eighth years, or in annual payments in the fourth and succeeding years varying from 10*l.* to 20*l.* As a matter of fact, the patentees, with few exceptions, elect to make the annual payments in preference to the lump sums of 50*l.* and 100*l.* In the United States of America inventors are not discouraged as they are here. There a patent may be obtained, which lasts for seventeen years, for a payment of about 7*l.* 10*s.* in the first instance, and no further fees of any kind are payable. A British patent which runs for fourteen years, therefore, costs more than twenty times as much as a United States patent which endures for seventeen years. Consequently, although there is a search as to novelty which weeds out a large proportion, there are twice as many patents issued in the States as there are in England, with corresponding advantages to the industries of that country. The patenting of not only home, but also foreign, inventions is thereby encouraged,

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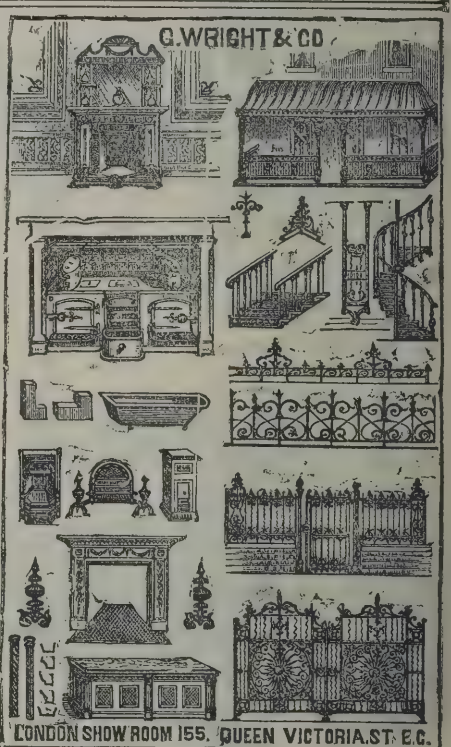
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and an inventor, having obtained a patent, is induced to push his invention, and to make further improvements in it. The success of an invention means the improvement or creation of some new industry, and hence the country shares with the patentee in the profits of the invention. Looking to the report of the Comptroller-General of Patents in this country for the year 1889, it appears that the total income from fees on patents was 151,794*l.* 4*s.* 4*d.*, of which sum 93,205*l.* was paid by way of renewal fees. The surplus profit of the office was a little more than this sum—namely, 93,534*l.* 8*s.* 9*d.*—and this went to the Treasury, and was used for the general purposes of government. It follows that if the annual taxes were abolished the Patent Office could still pay its way. This surplus profit is, therefore, a direct tax upon the inventors. The taxation of inventors through the medium of "renewal fees" is a remnant of the old demands and perquisites incident to the passing of letters patent under the Great Seal. It is entirely inequitable in principle, it works great injustice and hardship in practice, and, by damaging the value of property in inventions, acts as a drag upon the inventive genius of the nation, and thereby injuriously affects all the industries of the country.

Sir F. Bramwell said he could not agree with the author that the United States system of patents compared favourably with the English system. Those who took a leading part in framing the Act of 1883 well considered the mode by which the poor working man should be enabled to obtain a patent at a price which should not be beyond his means. It was thought that the best way of attaining this end would be to have a very small initial fee, giving provisional protection for a certain period. This system placed the comparatively poor man in a better position than in the case where a heavier charge was made in the first instance. A patent, however, might be so bad that it was not worth the while of any one to take it up, and yet it might contain a discovery of such a character as to prevent any one from using an improvement. In these cases it was contrary to the interests of the community that such patents should exist, because they were not good enough to be worked, and they might be an obstacle to improvement. He urged that it was the duty of those who managed the Patent Office to see that before the statement was allowed to go forth of a surplus being in hand all the expenses incident to a well-conducted office were properly provided for. He was sorry to say that was not the case here. The way in which the specifications were offered to public companies was a disgrace. The type had become crowded and inconvenient, almost illegible; the margin was so reduced as to prevent comments being jotted down; and the engravings, instead of being of the dimensions filed, were sent out reduced by lithography of the worst character. In many cases one was compelled to refer to the original drawing. He advocated a more liberal expenditure of money in the Patent Office. As a matter of expediency the money should be spent in such a way as would give to the public specifications in the clearest and most intelligible form.

Mr. Edmunds summed up, and defended the Patent Office against the criticism applied to the manner in which it dealt with specifications. These were so bulky and numerous as to render it exceedingly difficult for adequate storage room to be found for them.

PORTLAND CEMENT.

THE paper which Mr. Henry Faija read at the meeting of the British Association at Cardiff treated of some of the peculiarities to be observed in Portland cements, and on the most advanced methods for determining their constructive values. After dealing with the manufacture of Portland cement and the materials from which it is manufactured, the author proceeded to describe in detail the proportions of lime, silica and alumina which would constitute an ordinary Portland cement, and explained that their degree of chemical affinity materially affects the quality of the cement produced. With respect to the setting properties of a cement, the speaker explained that there were two periods which might with advantage be noted when carrying out a test; the one being the "initial set," or, in other words, the time which elapsed between the addition of water to the cement and its commencing to set, and the time when it was "set hard"; the time of "initial set" being considered the most important, as it represented the commencement of an actual chemical process, and that any disturbance of the cement after the setting or crystallisation had commenced would detract from its ultimate strength, whereas the time of "set hard" was only a somewhat undefinable period, and really indicated no change in the chemical process, being only one step towards the ultimate hardness and strength which the cement would attain. The test, however, which the speaker considered the most important was that by which its "soundness," or freedom from expansion or contraction, was determined, and he explained that no matter in what time the cement set, to what fineness it was ground, or what tensile strength it



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developed within the limited period of an ordinary test, could possibly be of any value if the cement proved an unsound one, and that in the course of time it would "blow" and destroy the work of which it was a component. The method of determining the soundness of a cement, which the speaker devised some ten years ago, was explained. It consists in submitting a freshly-made pat to a moist atmosphere of about 100 deg. F., and when set hard immersing it for some hours in water at a temperature of 115 deg. F. This treatment, he said, greatly expedites the set and hardening of a cement, and in like manner develops any blowing tendency which may exist in it, and consequently in the short time of twenty-four hours the "soundness" or "unsoundness" of a cement may be absolutely determined.

A CHANNEL TUBULAR RAILWAY.

THE Mechanical Science Section of the meeting of the British Association was crowded when Sir E. J. Reed, M.P., read a description of the proposed "Channel Tubular Railway." He said :—

The sea in the Channel is everywhere of very moderate depth, and where the bottom is not practically level, its departures from the level are surprisingly small and gradual. The cliffs between Dover and Folkestone are in places 450 feet high above low water ; but the depth of the Channel nowhere reaches 200 feet upon my selected line from England to France. For several miles out from the English coast it is not 100 feet deep ; and the greatest depth, roughly speaking, is about two-thirds of the way across to France, and there its maximum is below 200 feet deep, viz. 186 feet. Now, the gradient of the Severn Tunnel on the Welsh side is 1 in 80, and therefore the Channel bed on the line in question has nowhere a gradient of even one-half as much as that of the Severn Tunnel. I am not, of course, dealing here with minor inequalities, but with the general level and slopes of the natural bed of the Channel at the part where I propose to cross it, viz. from a point between Dover and Folkestone to a point just to the south of Cape Grisnez. Proceeding, Sir Edward gave a detailed description of the levels of the sea-bed between France and England at this part, and said :—We have an almost level stretch of ground of over twenty miles in length to be traversed by a railway, and a proposition which I will submit to you is that, were this a dry valley with no water in it, no mortal man would ever dream of tunnelling underneath it in order to construct a railway, nor would anyone be so insane as to propose to build a viaduct or series of bridges 500 feet high across it. The railway would, of course, be laid along the ground as it is laid over any other stretch of level country.

But the sea overspreads this almost level tract of ground, and its presence has to be taken into account. The question arises, what difference does this presence of the water make in the problem? I answer, it imposes three obligations upon us :—1. We must make the railway a closed-in, instead of an open, road. 2. As the water is tidal, and continually in more or less movement, we have to secure it in position. 3. We have to give it special ventilation, or, otherwise, to provide that the air within it is kept as pure as is necessary. These three objects accomplished, a railway across this piece of submarine ground is as good as any other railway. Now, all these three objects are provided for in the Channel Tubular Railway. The fact that it is a railroad within a perfectly watertight and durable tube, or, as it is, in fact, a pair of tubes, for I have a tube for each line of railroad, completely renders the presence of the sea-water outside of it of no consequence. The securing of these tubes in place, and the ventilation of them, bring me to the details of the system.

I would here point out, however, that the necessity which drives us to the use of water-tight tubes for our purpose is attended incidentally by enormous advantages. With our immense iron and steel resources, it is natural, of course, that we should make our tubes of iron or steel, in so far as the primary and essential elements of their structure are concerned ; and this at once, and obviously, relieves us almost entirely, if not altogether, of the cost, the difficulty, the delay and the danger of doing our construction work at the bottom of the sea. As a matter of fact, with a view to their due weight, durability and economy, I practically imbed the steel structure of the tubes in good Portland cement concrete, thus converting the tubes into stone tubes, which derive their structural strength from imbedded steel framing and plating. These tubes can be perfectly well built by our shipbuilders and engineers, and partly by those of France, just as ships are built, but with much greater economy. All we have to do is afterwards to tow them to their places, sink them, connect them, and secure them. The adoption of this tubular railway, with several hundreds of thousands of tons of steel structures, will therefore be a great blessing to our steel manufacturers and to our shipbuilders and engineers.

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The tubes thus made will be towed by steamers from the building ports to the Channel as they are required for being laid in place, and the operation of laying them is one which has been very carefully studied and worked out in order to make it safe and certain. To this end I have devised the system of making the length of tube which has last been laid the means and the instrument of bringing the next length into its position with unerring accuracy. There are those who believe that these successive tubes might be lowered into their places from ships with sufficient accuracy and safety. I doubt that, and I do not trust to it. I have no great faith in the minute adjustment of submarine works by means of ships exposed to wind and tide and in themselves more or less unwieldy. I should be afraid to lower these large tubes separately, and run the risk of striking and injuring one against another. I immensely prefer to make each of these great strong tubes perform the function of guiding the next length into its place, establishing the jointed connection of one with the other at the surface, where everything can be seen and kept under full control. He described various details of the plan, and went on to say :—The passage of trains through the tubes can never do more than, first, neutralise their buoyancy, and then impose half a ton of weight per foot upon them. This should determine the vertical strength of the tubes. But I really make them much stronger, in order to enable them to sustain the far greater strain of being filled with water under any conceivable circumstances—as, for example, in war time if that should be thought necessary. It is probable that, in view of this, I shall leave the tubes with a buoyancy of one ton per foot, or even more, as a set off to this weight of water ; but in any case the ability of the tubes to sustain trains will be greatly in excess of that of any aerial bridges now constructed. These tubes will, in fact, from their intrinsic buoyancy, be practically bridges without any weight of their own to sustain, whereas with ordinary railway bridges their own weight is by far the greatest part of the burden they have to bear. It is difficult to explain in words alone the operation of laying the tubes. But, obviously, if one end only of a buoyant tube is forcibly taken down from the surface of the water to the bottom, or nearly to the bottom, the other end will float and rise somewhat above the surface. This being so, a pier wholly afloat at the time is brought up to the emerged end of the tube, and coupled up to it by enormous hinge-joints. The next length of floating tube is then brought up to the other side of the floating pier, and similarly jointed to it. The pier is now sunk by suitable means and under proper control, and as it goes down, carries with it the second end (so to speak) of the first-named tube and the first end of the last-named tube. The other end of this latter tube floats, of course, and the operation is repeated. In this manner tube after tube is laid, with piers between the successive lengths, until the whole is accomplished. The lines of railway, of course, pass continuously through the piers as well as the tubes. The whole operation is like the paying out of a huge cable link by link, tubes and piers alike forming, as it were, the links of the cable.

But as the tubes may be regarded as approximately of 20 feet in diameter and 300 feet long, formed of immense strength, the leverage brought upon each joint when at the bottom would be enormous during the greatest strength of the tide, and when the pier and adjacent tubes were floating at the surface. This consideration has made another arrangement necessary. I set the tubes which take the separate lines of railway at a distance of, say, 50 feet apart (this distance and other things varying with circumstances), and I connect the two tubes by partial webs, so as to form the whole into a large horizontal girder, having a tube for each flange. Only engineers can measure the immense, the altogether unexampled, strength of a girder of this character, perfectly unprecedented in the annals of engineering. But some idea of its strength may be conceived when it is compared with the vertical girders of the Britannia Tubular Bridge, observing that in the latter the top and bottom flanges were about $1\frac{1}{3}$ feet deep, set about 30 feet apart (if I remember rightly), while in the present case the flanges are 20 feet in diameter, and these are set 70 feet apart from centre to centre. Girders like these can be held by the end, and subjected with absolute security to all the strains which the tide can impose upon them during the depositing operations which I have described. The precise details, measurements and scantlings of this novel construction can only be determined after the line of the tube across the Channel has been very closely and carefully surveyed for depth, nature and consistency of bottom and tidal currents at surface and bottom, and when the best position for each pier has been selected. For this reason I abstain from presenting details to the Association. For the same reason I abstain from giving an estimate of the cost. The approximate cost will be between 12,000,000*l.* and 15,000,000*l.* sterling, a sum which will not be surprising when one considers that, if we for a moment take the cost of a rivetted steel tube to average 15*l.* per ton, and remember that the length of each of my two tubes, regarded as continuous, is 120,000 feet, the two tubes, if

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approximately equivalent to a uniform thickness of 2 inches and 20 feet in diameter, would cost about 8,000,000*l.* sterling, without webs, extras for piers, concrete, expenses of laying, engineer's charges, interest during construction, or other financial requirements. On the other hand, it is to be observed that, for reasons soon to be stated, no extraneous cost for military defences or the like would be required in this case. Lest any one should be startled at the idea of the Channel Railway costing 12,000,000*l.* to 15,000,000*l.* sterling, I will point out that the bridging of the Missouri at St. Louis, where it was but 1,630 feet wide, cost 1,307,000*l.*, that more recently the Forth Bridge, crossing waters of an aggregate width of 5,700 feet, cost 3,200,000*l.* The only remark which it seems necessary to add is that, if a portion only of the railway traffic of Scotland crossing the Firth of Forth is sufficient, as it appears to have been, to justify an outlay upon one railway bridge of over 3,000,000*l.*, there can be no reasonable grounds for doubting that the traffic between the British Isles and the Continent of Europe would amply justify an outlay of 12,000,000*l.* to 15,000,000*l.*

There remains the question of national security, which many suppose the Channel Tunnel to infringe. I believe that my system puts the question of national security beyond all question. The very object of this proposal of a Channel Tubular Railway is to provide railway communication between England and France, without the least risk or possibility of the railway being employed for military purposes by an enemy of this country. In the case of the Channel Tunnel, were that carried out, it would undoubtedly afford a subterranean military road, which, were it once secured by an enemy, might, in the opinion of many, be held in spite of us, because this subterranean road, being deeply situated below the Channel bed, would be completely preserved from attack by the British Navy. The Channel Tubular Railway, on the contrary, is everywhere situated above the bed of the Channel, and could, therefore, be attacked at every point by dynamite. At the same time, it is so constructed and brought up along the foreshore (at a gradient of 1 in 80), as to be exposed for a length of no less than 3,160 feet to the direct fire of the guns of ships between the high-water and low-water limit. It will be constructed at this part so as to be easily penetrable by gun-fire, and any breach or hole made in it below high-water mark would, of course, admit the sea at the next tide to the whole interior of the tube. The target presented to the fire of ships would be of the length given above (3,160 feet), and it would present a surface of about 38,000 square feet, and would be readily struck by ships' guns. It is inconceivable that a railroad thus open, between high and low water, to injury and flooding by gun-fire and under water by torpedoes and otherwise, could ever be employed as a military road into this country. While thus avoiding the great military objection to the Tunnel, this plan likewise avoids equally the objections which would lie against a bridge, such as that which has been proposed in France for the Channel, the construction of which bridge would involve the necessity for impeding navigation by more than 120 mid-water piers, many of them so large that they might almost be called islands. The Tubular Railway is taken, at the gradient stated above, down along and for some distance parallel to the coast, and when at a distance of less than 1,200 feet from low-water mark it is already below the keels of the deepest ships, so that at that very small distance from the shore it ceases to offer any impediment whatever to navigation. The tube would nowhere fail to lie at an ample depth below the keels of all ships in the stormiest weather known to the Channel.

I will only add a word or two upon the question of ventilation. It will be observed that one of the tubes will be employed for traffic to France, and the other for the reverse traffic to England. The trains in each tube will therefore always pass through it in the same direction. The trains themselves will consequently act to some extent as ventilating pistons, forcing air out at one end of the tube and drawing it in at the other. By fitting wings to the engines or carriages, and throwing them out when necessary, the train may be made to fit the tube more nearly, so to speak, and thus to add to the efficiency of this source of ventilation. If other ventilation should be thought necessary, which is very doubtful if electric engines are employed, one or more of the piers can be fitted up as a ventilating station, with steam-engines, air-pumps, &c., the foul air of the tubes being forced into suitable chambers, and thence by non-return valves into the sea.

In conclusion, I ought perhaps to apologise to railway engineers and to those who construct tunnels and bridges for presenting my scheme to the world. But the truth is that the presence of the sea-water in the Channel seems to me to bring the question into my own domain, if I may so speak; and the processes of constructing and handling and placing the tubes upon the sea-bed really fall so naturally in with my experience and practice, that I feel fully justified in submitting it and in urging its adoption. I yield to no one in my desire to keep this country absolutely safe from military invasion under all circum-

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stances, and I am convinced that no possible danger could arise from it. England must be left not only without a single ship in the Channel which can fire a gun, or a single boat that can tow a torpedo, before any possible harm can arise to us from this tubular railway; and were we reduced to that condition our invasion would need no tube to facilitate it. That is true, I believe, which an eminent officer of the Royal Engineers recently said to me, viz.:—"If French or other troops were such fools as to go into your tube with war existing or pending, you would deserve the thanks of your country for having provided so simple and certain a means of destroying them wholesale." I am glad to be able to add that a great many members of Parliament, who always strongly oppose the Channel Tunnel, are quite in favour of my system, and among these are several of such great influence that I have little fear of my Bill being successfully opposed in either House.

Mr. Abernethy, in criticising the paper, stated that he could not agree with Sir Edward Reed's approximation of cost, and he was afraid the scheme would not be favourably received by the financial world. He himself was in favour of Sir John Fowler's scheme for the construction of huge ferries whereby trains could be carried bodily across the Channel.

Mr. Greathead, who is one of the greatest authorities on tunnel engineering, referring to the question of cost, stated that the expense of constructing a submerged tube would be out of all proportion to the amount of work to be done. Moreover, the fact that the tube could be destroyed by dynamite by any lunatic who chose to explode it was in itself a sufficient condemnation of the scheme.

Professor M. Fitzgerald described at length a proposal made some time ago for channelling the North Channel between Ireland and this country.

Mr. P. F. Nursey said this question had been under consideration for 100 years, and he himself had read two papers before the Society of Engineers on the question of tubing the Channel for railway purposes. Notwithstanding this fact, he was not an advocate of either tube or tunnel, but favoured Sir John Fowler's scheme for improving the harbour at each side of the Channel, and constructing ships to carry the trains across.

Sir Benjamin Baker, referring to the question of cost, said he believed the scheme proposed by Sir Edward Reed would cost nearer thirty millions than fifteen millions. He knew the difficulties of engineering under a great pressure of water, and it was a work that he looked upon with great respect, born of experience. The railway companies, who were the people chiefly interested, had objected to Sir John Fowler's scheme on account of the cost of one and a half millions which it would involve. How much more likely was a scheme to make a profitable return which, according to Sir Edward Reed's own estimate, would cost from twelve to fifteen millions to complete?

Sir Edward Reed replied, and a vote of thanks was accorded to him for his paper.

PATENTS.

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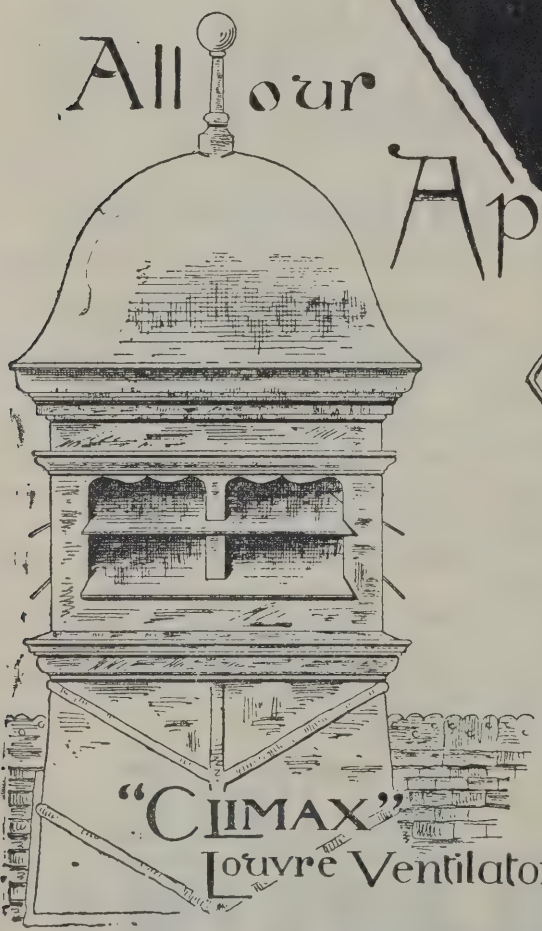
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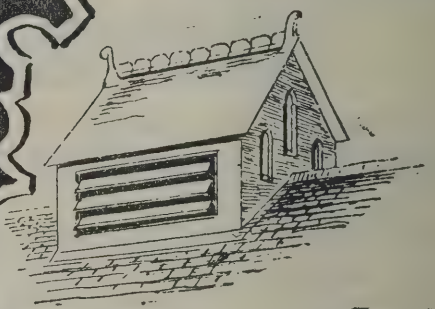
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Friday, August 28, 1891.

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The Contract Reporter.

to The Architect.

LONDON, SEPTEMBER 4, 1891.

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EASTLEIGH.—Sept. 28.—Plans are required for Sewerage and Sewage Disposal. Mr. Joseph Robins, Clerk to the South Stoneham Rural Sanitary Authority, 19 and 20 Portland Street, Southampton.

LUTON.—Sept. 8.—Designs are invited for Alterations to Waller Street Plait Hall. Mr. E. J. Lovegrove, C.E., Town Hall, Luton.

SHREWSBURY.—Sept. 30.—Designs, &c., are invited for Building Police Station, Constable's House, &c. Mr. W. C. Eddowes, Borough Surveyor, The Square, Shrewsbury.

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BARKING.—Sept. 10.—For Sewering and Making Roads. Mr. C. J. Dawson, Surveyor, Local Board Offices, East Street, Barking, Essex.

BARRY DOCK.—Sept. 7.—For Building School. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

BIRMINGHAM.—For Building Manufactory, Great Lister Street. Mr. F. J. Yates, Architect, 88 Colmore Row, Birmingham.

BLACKWALL.—Oct. 12.—For Constructing (by Compressed Air) and Maintaining Carriageway and Footway Tunnel under the River Thames. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

BLACKWOOD.—Sept. 14.—For Additions, &c., to Board Schools. Mr. W. L. Griffiths, Architect, High Street, Newport, Mon.

BRADFORD.—Sept. 4.—For Extension of Premises, Bolton Road. Messrs. T. H. & F. Healey, Architects, Tyrrel Street, Bradford.

BRADFORD.—Sept. 7.—For Extension of Thorncliffe Laundry. Messrs. Milnes & France, Architects, Bradford.

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FENNY STRATFORD.—Sept. 7.—For Building Chapel and Schools. Pastor H. S. Smith, Fenny Stratford.

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FULHAM.—Sept. 9.—For Making Roads. Mr. W. Sykes, Town Hall, Walham Green.

FULHAM.—Sept. 9.—For Supplying and Laying Creosoted Deal Blocks. Mr. James P. Norrington, Town Hall, Walham Green.

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HANLEY.—Sept. 12.—For Building Two-storey Warehouse, &c., and Extension of Offices at Phœnix Works. Messrs. Wm. Sugden & Son, Architects, Leek.

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HENDON.—Sept. 7.—For Kerbing and Tar Paving. Mr. W. A. Tootell, Clerk, Rural Sanitary Authority, Edgware.

HORNSEY.—Sept. 12.—For Building Public Baths and Washhouses. Mr. A. Hessell Tiltman, Architect, 70 Torrington Square, W.C.

HORNSEY.—Sept. 16.—For Making Good Roads. Mr. T. De Courcey Meade, Engineer, Local Board Offices, Southwood Lane, Highgate, N.

HULL.—Sept. 18.—For Supply of Cast-iron Cylinders, Columns, Caps, Shoes, &c. Mr. A. E. White, Borough Engineer, Town Hall, Hull.

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KENDAL.—Sept. 11.—For Building Dwelling-house, &c. Mr. Stephen Shaw, Architect, 45 Highgate, Kendal.

LEIGH.—For Building Cheese Factory. Mr. G. Wooddisse, Church Leigh, Stoke-on-Trent.

MANCHESTER.—Sept. 10.—For Excavator and Mason Work, Gymnasia, Birchfields, The City Surveyor.

MANCHESTER.—Sept. 15.—For Supplying and Fixing Ironwork in Construction of Gymnasia, Birchfields. The City Surveyor, Town Hall, Manchester.

MARYPORT.—Sept. 15.—For Building Nine Shops and Dwelling-houses. Mr. C. Eaglesfield, Architect, Maryport.

MERIDEN.—Sept. 7.—For Repairing Bells at Workhouse, Fitting up New Bells, &c., and Providing and Fixing Electric Bells. Mr. Arthur Seymour, 10 Hay Lane, Coventry.

NEW BARNET.—Sept. 9.—For Building Small House. Mr. Joseph White, 35 High Street, Barnet.

NUNEATON.—For Supply of Gravel and Sand. Mr. Jos. S. Pickering, Engineer, Town Hall, Nuneaton.

OXFORD.—Sept. 12.—For Building Stables, Shedding, &c. Mr. W. H. White, City Engineer, Oxford.

PENARTH.—Sept. 5.—For Private Street Improvement Works. Mr. J. W. Morris, Clerk to the Local Board, Penarth.

PONTYPRIDD.—Sept. 5.—For Converting House, Hopkin's Town, into Sunday School. Mr. W. I. Morris, Norfolk House, Pontypridd.

READING.—Sept. 10.—For Removing Blake's Bridge, &c. Mr. Arthur T. Walmisley, 9 Victoria Street, Westminster, S.W.

REIGATE.—Sept. 8.—For Sewerage and Sewage Disposal, Mr. John Anstie, Engineer, 17 Victoria Street, Westminster. S.W.

SALFORD.—Sept. 4.—For Building Stable and Fire-engine Shed. The Borough Engineer, Town Hall, Salford.

SEVENOAKS.—Sept. 4.—For Constructing Sewers and Making-up Roads. Mr. Jabez Mann, Surveyor, Local Board Offices, Argyle Road, Sevenoaks.

SITTINGBOURNE.—Sept. 7.—For Supply of Broken Granite. Mr. W. J. Harris, Local Board Offices, Sittingbourne.

SOUTHAMPTON.—Sept. 8.—For Strengthening Portion of Town Quay Extension for Electric Cranes. Mr. J. G. Poole, Surveyor, 2 Portland Street, Southampton.

SOUTH HORNSEY.—Sept. 9.—For Supply and Delivery of Broken Granite, Flints, Gravel and Ware Ballast. Mr. W. Jameson, Local Board Offices, Milton Road, South Hornsey, N.

SOUTH SHIELDS.—Sept. 8.—For Construction of Tanks and Gearing for Shipment of Refuse. Mr. J. Watt Sandeman, Engineer, 2 Nicholas Buildings, Newcastle-on-Tyne.

SOWERBY BRIDGE.—Sept. 11.—For Building Eight Houses, Carr Head. Mr. S. Wilkinson, Architect, Sowerby Bridge.

STOCKPORT.—Sept. 7.—For Building Fireproof Mill. Messrs. Stott & Sons, Architects, 5 Cross Street, Manchester.

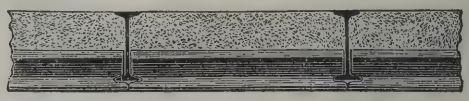
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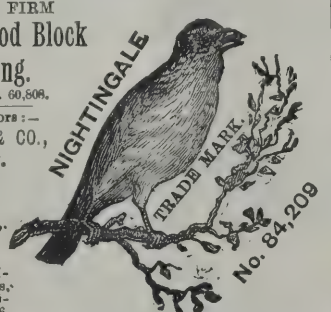
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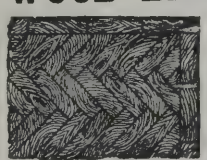
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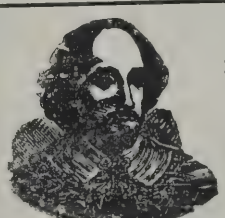
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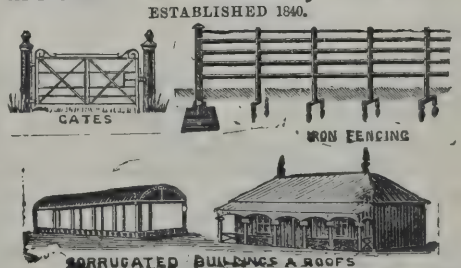
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For Building Hotel, Mill Parade, Newport, Mon., for Mr. Christopher Griffiths, Brewer. Mr. E. A. LANSDOWNE, Architect, Newport, Mon. Quantities by Architect.

I. D. Williams, Knighton	£8,220	0	0
Bowers, Hereford	7,555	0	0
Blackburne, Newport	7,096	0	0
Price, Newport	7,095	0	0
Stephens & Bastow, Bristol	7,048	0	0
Lock, Newport	6,985	0	0
Richards, Newport	6,650	0	0
Jones & Son, Newport	6,490	0	0
John Linton, Newport	6,150	0	0
Wyatt & Pit, Newport	5,921	0	0

PLYMOUTH.

For Extension of Premises, Shop Front, &c., corner Cambridge and Oxford Streets, Plymouth, for Mr. A. Frost. Mr. J. HARVEY, M.S.A., Architect, Bedford Chambers, Plymouth.

W. J. Bone, Plymouth	£183	0	0
W. H. Palmer, Plymouth	181	10	0
Wakeham Bros., Plymouth	152	0	0
A. Andrews, Plymouth	140	0	0
Pearn & Son, Plymouth	134	0	0
A. N. Coles, Plymouth	130	0	0
SAMUEL ROBERTS, Plymouth (*accepted*)	128	0	0

PONTYPOOL.

For Building Workshops for Weights and Measures Department, Pontypool. Mr. W. TANNER, County Surveyor, Newport.

J. Burgoyne, Pontypool	£285	0	0
T. G. Diamond, Newport	260	0	0
Moulton & Brownscombe, Newport	248	0	0
MORGAN & EVANS, Pontnewynydd (*accepted*)	205	0	0

For Works at Schools, &c., for the Trevethin School Board. Mr. E. A. LANSDOWNE, Architect, Newport, Mon.

New Infants' Schools, Master's House, &c., at Varteg Hill.

MORGAN & EVANS, Pontypool*	£2,145	0	0

* Accepted subject to approval of Education Department.

New Classroom, Garndiffiths.

J. MORGAN, Blaenavon (*accepted*)	380	0	0

New Schoolmaster's House, Snatchwood.

W. JONES (*accepted*)	405	0	0

New Classroom, Pontypool Schools.

J. RALPH, Pontypool (*accepted*)	344	0	0

PRESTWICH.

For Additions to St. Margaret's Schools, Prestwich. Mr. PERCY D. LODGE, Architect, 49 Princes Street, Manchester. Quantities by Architect.

E. Wood, Lower Broughton	£1,083	0	0
Wood & Huddlestone, Manchester	1,047	0	0
G. & J. Barber, Prestwich	997	15	0
J. Leach & Sons, Prestwich	997	10	0
Smith & Goodwin, Lower Broughton	977	0	0
R. WHITELL, Manchester (*accepted*)	949	0	0

RHOSLLERCHRUGOG.

For Alterations to Penuel Baptist Chapel, Rhosllerchrugog, Denbighshire. Mr. OWEN MORRIS ROBERTS, Architect, Portmadoc.

JOHN WILLIAMS, Ruabon (*accepted*)	£1,093	0	0

SEVENOAKS.

For Alterations and Additions to Cottage on the Warren Estate, Sevenoaks. Mr. H. PERCY MONCKTON, Architect, F.R.I.B.A., 32 Walbrook, E.C.

Semark	£230	0	0
Iggulden	210	0	0
Avard	171	0	0
ALLCORN & SON (*accepted*)	144	17	8

STOKECLIMSLAND.

For Building Pair of Labourers' Cottages, &c., on Trehingsta Farm, Stokeclimsland, for the Duchy of Cornwall. Mr. S. HOOPER, Architect and Surveyor, Hatherleigh.

R. H. Rumnall, Liskeard	£1,185	0	0
W. Broad, Launceston	1,050	0	0
W. PETHRICK, Hatherleigh (*accepted*)	948	0	0
Surveyor's estimate	985	0	0

WIMBLEDON.

For Erection of Three Houses, Gladstone Road. Mr. R. CRUWYS, M.S.A., Architect, Bank Chambers, 465 Brixton Road, S.W.

Cromwell	£1,513	0	0
Ackermann	1,187	0	0
Heywood	1,174	0	0
BRYANT (*accepted*)	822	0	0

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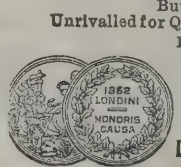
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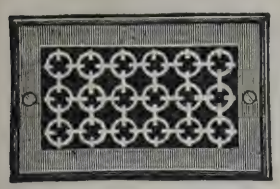
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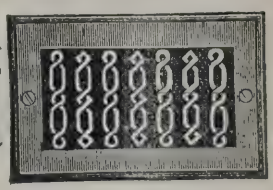
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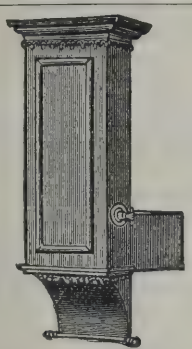
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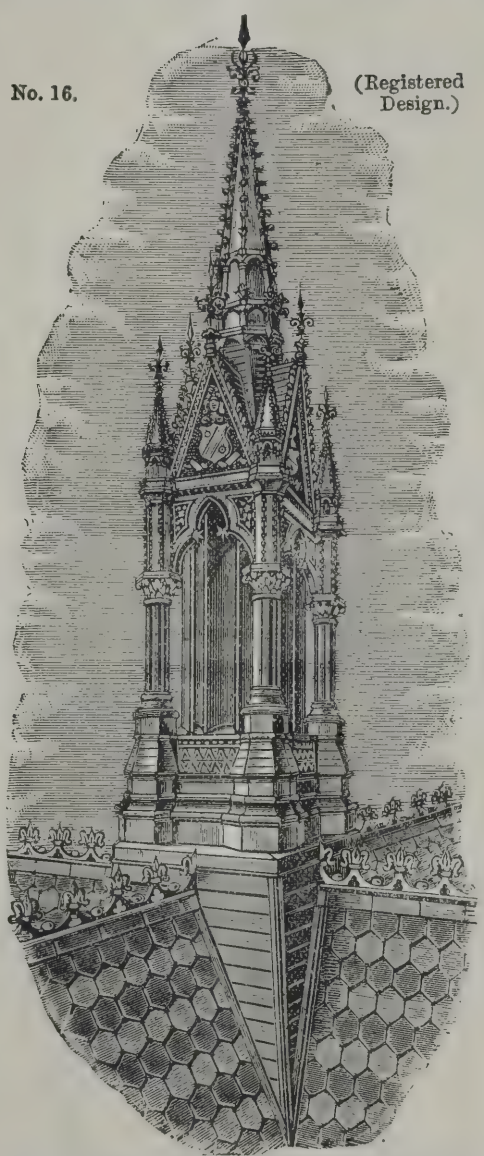


No. 7 (Inlet).
ORNAMENTAL BRACKET PATTERN.



No. 3 (Registered Design).
GIBBS' PATENT WEATHERPROOF EXTRACTOR.

No. 16. (Registered Design.)



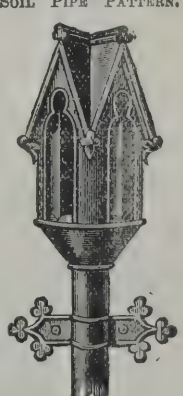
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Extractor, 12 in. dia.			.....	4½ to 6 in. pipe..	£1	11	6	Extractor, 20 in. dia.			.....	8 to 10 in. pipe..	£3	17	0	Extractor, 36 in. dia.			.....	14 to 18 in. pipe..	£9	15	0
,,	14	,,	.....	5 to 7 ,, ..	1	17	6	,,	24	,,	.....	9 to 12 ,, ..	5	5	0	,,	42	,,	.....	16 to 20 ,, ..	11	17	6
,,	16	,,	.....	6 to 8 ,, ..	2	12	6	,,	27	,,	.....	12 to 14 ,, ..	6	7	6	,,	48	,,	.....	18 to 24 ,, ..	16	15	0
,,	18	,,	.....	7 to 9 ,, ..	3	5	0	,,	30	,,	.....	13 to 15 ,, ..	7	10	0	,,	54	,,	.....	20 to 27 ,, ..	19	0	0

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For Works at St. John's Church, Bridgetown, Totnes. Mr. W. M. TOLLIT, Architect, Totnes.

J. G. COLE, Totnes (*accepted*)	£90 0 0

WOOLWICH.

For Improvement Works, Elizabeth Street, North Woolwich. Mr. H. O. THOMAS, Surveyor, Town Hall, Woolwich.

J. Mowlem & Co., Westminster	£375 0 0
Woodham & Fry, Greenwich	319 0 0
RACKHAM & BENTHAM, Plumstead (*accepted*) .	314 0 0

TRADE NOTES.

IT may be remembered that in the spring of 1888 Professor Oliver Lodge, F.R.S., gave two lectures on Lightning Conductors to the Society of Arts, in which he promulgated several revolutionary views on the subject, and supported them by a series of direct experiments with Leyden jars. The experiments also branched off into a study of electric waves, a subject which was being simultaneously worked at in Germany by Hertz. At the British Association meeting in Bath that same year, Professor Lodge's views were good-naturedly controverted by Mr. W. H. Preece, partly for the purpose of raising a discussion and partly because some of them were rather startling. Since then a more complete communication from Professor Lodge to the Institution of Electrical Engineers and to many scientific periodicals, as well as a recent paper read before the Royal Society, are generally held to have fairly substantiated the new views, and we understand that during the present year Professor Lodge has been engaged in welding together the principal portions of all this literature, with sundry additions, and that Messrs. Whittaker & Co. propose to issue it as a large volume of their Specialists' Series in the course of the autumn.

THE new Workhouse Hospitals, Reading, which are nearing completion, are being warmed and ventilated throughout by Mr. E. H. Shorland, of Manchester. In the large wards are fixed Shorland's double-fronted patent Manchester stoves, with descending smoke flues, and in the smaller wards Shorland's patent Manchester grates.

THE Grand Hotel, Cromer, opened last month, has been fitted up with H. Heim's patent smoke-consuming "Calorifer" heating apparatus, under the superintendence of the architects, Messrs. G. J. & F. W. Skipper, of Norwich. The total cost of the buildings exceeded 15,000*l.*

WE are glad to learn that the damage done by the fire at the London Parquetry Works, Grove Lane, Camberwell, S.E., on Wednesday night is covered by insurance, and that business will be carried on as usual.

THE extent to which new and superior quality building materials have come into use within the last ten years is well illustrated, the *Canadian Architect* says, by the growth of the Canadian pressed brick industry. Five years ago pressed brick was a rarity. Three or four years ago some enterprising Canadians began to manufacture pressed brick, and in a short time were able to offer an article which stood a fair comparison with the imported brick, and at half the price. The result is a wonderfully increasing demand, and a multiplication of manufacturers from one to four or five. Not only is pressed brick everywhere to be observed in the cities, but from the towns throughout the country there also comes a considerable demand. The facilities for cheap production are such that it is believed Canadian manufacturers would be able to compete with advantage for business in some of the American cities near the border.

A WEAVING-SHED is about to be opened for the winter session in connection with the Stockport Technical School. The shed, which is now complete, is 60 feet by 80 feet. The machinery is all of the most modern type. Mr. Greaves, of Mile End, Stockport, has presented looms for the production of fancy fabrics.

PROFESSOR SHUTTLEWORTH, having introduced the electric light into the City church of St. Nicholas Cole Abbey, of which he is rector, declares that henceforth the congregation "will be relieved of the insufferable atmosphere of the gas, which put the organ out of tune and the people out of temper, and spoiled the colour on the walls and ceiling."

THE plumbers, gas and steamfitters of London, Ont., the *Canadian Architect* says, having failed to induce their employers to reduce their hours from fifty-four to fifty per week and increase their wages from 23 to 25 cents per hour, have for the past three weeks enjoyed a holiday, while the master plumbers have been forced to take off their coats and "earn their bread by the sweat of their brows." The strike, which promises soon to cease, has brought a few outsiders to the city, and these, with the repentant strikers, who do not like the idea

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Manchester Town Hall	Craig-y-Nos Castle (Mad. Patti)
Exeter Cathedral	Eddystone Lighthouse
Llandaff ,,	Birmingham Municipal Buildings
Wells ,,	Hove Town Hall
Sligo ,,	Burnley, Holy Trinity Church
Bradford Town Hall	Crawley Parish Church
St. James's Palace, London	Corbridge-on-Tyne Parish Church
Sherborne Abbey	Windermere Church
Sydney Town Hall, N.S.W.	Eiffel Tower, Paris
Durban Town Hall, S.A.	

Royal Military Exhibition, &c., &c., &c.
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General Post Office	*Junior United and other Clubs*
Stock Exchange	*The Langham Hotel*
City Bank	*Hotel Windsor, and others*
London County Council	*The Café Monico*
L. & N. W. and other Railways	*Baron de Rothschild's*
Theatre Royal, Drury Lane	*Sir David Salomons*
Garrick Theatre	*The Security Co.*
St. James's Hall	*Messrs. J. & P. Coats, Limited, Paisley &c.*
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of resting without pay, are managing to keep pace with the work. The time chosen was inopportune, as most of the spring contract work has neared completion, and none of the trades have been troubled with too much work this year. If a movement had been on foot in Canada similar to the one so successfully inaugurated here by the Plumbers' Company, the above paragraph would probably not have been written. Trade disputes would be equitably settled without resorting to strikes when the incompetent operatives were weeded out by some system akin to registration.

THE Sanitary Committee of the Leeds Town Council have resolved to recommend the Council to erect another destructor in Meanwood Lane, the estimated cost of which is 4,000*l.*

THE Birkenhead Finance Committee have accepted the tender of Messrs. A. White & Sons to decorate the principal entrance, staircase and certain rooms and corridors at the Town Hall for 500*l.*

THE Shoreditch Vestry have decided to obtain power to supply electricity within the parish of Shoreditch for public and private purposes, and to memorialise the Board of Trade for a provisional order.

THE contract for the drainage of Flamborough has been let to a Hull firm for 1,700*l.*, and will be begun at an early date.

APPLICATION is to be made for a loan in order to proceed with the waterworks for Colwyn Bay and district, the cost being estimated at 25,000*l.* Mr. Farrington is the engineer.

THE Liverpool *Journal of Commerce* says:—The Upper Congo abounds in forests, and many of the woods are hard, and would prove of value in Europe. Mahogany and ebony, camwood, and a timber strong almost as teak, known locally as ironwood, are found in the interior, but the question of transport stands in the way of their being utilised by commerce.

NEW assembly rooms have been opened at Hayden, and every care has been taken to make the ventilation as efficient as possible. It was entrusted, after careful inquiries as to the capabilities of various systems, to the Climax Ventilating Company, of 15 Great George Street, Westminster, the appliances being specially designed by them to harmonise with the architectural features of the building.

A TRADE circular has just been issued by Messrs. Allard & Sons, of Paris, New York and Regent Street, London, calling attention to their specialities in work, such as carved oak joinery and in other woods, parquet flooring, marquetry, marble and marble mosaic, fibrous plaster work of every description, Carton Pierre, artistic iron and bronze work and artistic decorations, also to their special manufacture of artistic furniture of all kinds, &c.

AMERICAN NOTES.

ACCORDING to the *Railway World*, Philadelphia, steam-pipes have recently been made of ramie fibre, hardened under tremendous hydraulic pressure, and possessing a tensile strength equal to two and a half times that of steel. The ramie fibre, or China grass, has the property of being unaffected by moisture; it will not shrink nor swell, it is a non-conductor of heat, it cannot rust, and these features, together with its great strength, are all desirable in steam-pipes, its utilisation in this line being regarded, therefore, as one of the possibilities of the future.

THE New York correspondent of the *Public Ledger* says:—Looking from the *Ledger* bureau in the Pulitzer Building one of the most conspicuous objects on the Jersey shore is the new Pennsylvania railroad depôt. Its spacious dome looms up in almost majestic proportions, and is visible by night as well as by day. The train-shed is now complete, and work has been begun on the waiting-room. The former is one of the biggest structures of the kind in the world, being 653 feet long, 256 feet wide and 115 feet high, and weighing 4,550,000 pounds. It gives space for twelve tracks with intervening platforms. The waiting-room, now in course of construction, will be 188 feet long by 84 wide, interior measurement. The elevated tracks through Jersey City, enabling the running of trains at speed in the city, the new and spacious depôt, the double-deck ferry-boats now building, the new ferry-houses in New York, with a bridge over West Street, soon to be constructed, are all notable improvements in which travellers on the Pennsylvania Railroad are already beginning to rejoice.

THE first courses of white marble are, *Stone*, of Indianapolis, says, being laid in the Montgomery Street front of the D. O. Mills Building in San Francisco. The two fronts of the building will be of Inyo white marble up to the sills of the third storey. The Montgomery Street front will be ornamented with eight columns of beautifully-polished moss-agate, also from the Inyo quarries, and will have carved capitals of the composite Corinthian order. The main arches will be profusely and artistically carved. All the inside wainscoting will be of highly-polished Inyo marble of an orange colour, streaked with

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MANSFIELD BROTHERS CHURCH GRESLEY BURTON ON TRENT.
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FOR HARDENING AND PRESERVING STONE.
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veins and resembling Italian sienna. The stair steps in the building and the floor tilings will be made of white marble. There will be used also a golden-coloured moss-agate or dendritic marble. The cost of the stone alone will aggregate 100,000 dols. Terra-cotta and pressed brick will be used above the stone front. There will be eleven storeys above the basement, and when completed the edifice will be an enduring and handsome monument of the superiority of the marble quarries of California. The stone of a recent test was crushed at a pressure of 33,600 lbs. to the cubic inch, while Italian marble crushed at pressure of 17,000 lbs.

THE *Sanitary News* of Chicago says :—The plumbers in England are continually advancing with their system of licensing. They are working for a national system of licensing plumbers through enactments of Parliament. At every meeting held by the plumbers this matter is freely and strongly endorsed, and many influential sanitarians and physicians favour the movement. There are several reasons why such a system should succeed, and why it would be just as good for this country as for England. Besides these reasons, it is clearly fair that the plumbers who push ahead and qualify themselves for the work they have undertaken should themselves be protected from the incompetent and untrustworthy who have spent but little time, labour and money in acquiring just enough knowledge of their trade to be dangerous.

IN the report of the proceedings of the meetings held by the American Forestry Association, just issued, is an interesting paper by Mr. Edgar T. Ensign, forest commissioner of Colorado, on the "Rocky Mountain Forests," in which the following occurs :—The forests, though mainly coniferous, are usually situated upon the mountain slopes, at altitudes varying from 4,500 to 12,000 feet above the sea. According to the best data obtainable by the writer, and including in the estimate all kinds of forest growth, light and heavy, valuable and inferior, the approximate forest areas in square miles of the several divisions are as follows : — Idaho, 15,990 ; Montana, 26,285 ; Wyoming, 12,060 ; Utah, 6,000 ; Colorado, 16,625 ; New Mexico, 12,500 ; Arizona, 10,300 ; the total being in round numbers 100,000 square miles, or 13·2 per cent. of the total land area. It will be seen Montana has the largest and Utah the smallest forest area. The relatively extensive forests are regarded as due to the fact that the region receives in many parts a comparatively large precipitation of moisture, and has abundant sunshine during a large portion of the year, although nearly surrounded by arid or semi-arid plains, and subject more or less to conditions of aridity, heat and cold inimical to forest growths. Except for the scourge of fire the forests would probably be at least one-third greater in extent than they are. Upon the western slope of the mountains the annual rainfall is greater than on the eastern, and this is the reason given for the presence there of the larger and more important forests. Furthermore the forests of that region have suffered less from fire and depredation than elsewhere. In all parts of the country northern exposures are the most favourable to forest growth as affording maximum conditions of moisture and a minimum degree of evaporation.

COLOUR in railroad carriage painting is a matter that is seldom thought of, as the deep red is so common that it may be said to be standard, says the Greenville *Advance-Argus*. However, just above Greenville, on the Franklin branch of the Lake Shore, may be seen carriages of a bright yellow. This æsthetic shade is the standard on the Lake Shore system. Besides the standard colour and the yellow, white, blue and royal red are in use, but only on certain trains. Several fast trains on the Baltimore and Ohio—Philadelphia and Reading route—between New York and Washington are resplendent in royal purple, and known as the "Royal Blue" expresses. The Columbian and Keystone expresses on the Pennsylvania are painted a bright royal red, and look like meteors as they shoot past way stations. On a Massachusetts road there is a train which is entirely white, and as it is a night train, is well named "the ghost train." The famous fast mail on the New York Central and the Lake Shore is also of white.

BUILDING AND BUILDERS.

PLANS have been prepared by Mr. H. Howard, surveyor to the Board, for new offices for the Littlehampton Local Board, which will be erected in Beach Road.

THE Brighton Sewers Board have been authorised to borrow 1,000*l.* for the construction of a retaining wall at Roedean.

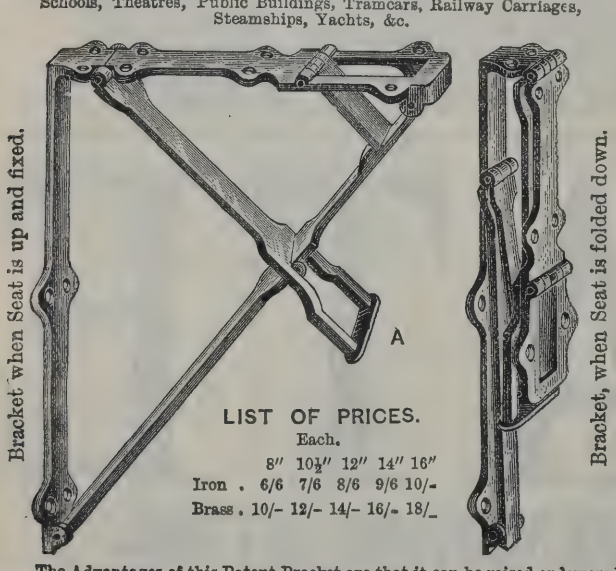
AT Llandudno forty building plots, situated on the Conway Bay side of Llandudno, the property of the Ecclesiastical Commissioners, have been offered for sale by auction, the idea being the construction of a west parade and several roads, to be named West Llandudno. Twenty of the lots were sold.

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For Seats, Shelves, Tables, &c. Specially adapted for use in Churches, Chapels, Schools, Theatres, Public Buildings, Tramcars, Railway Carriages, Steamships, Yachts, &c.

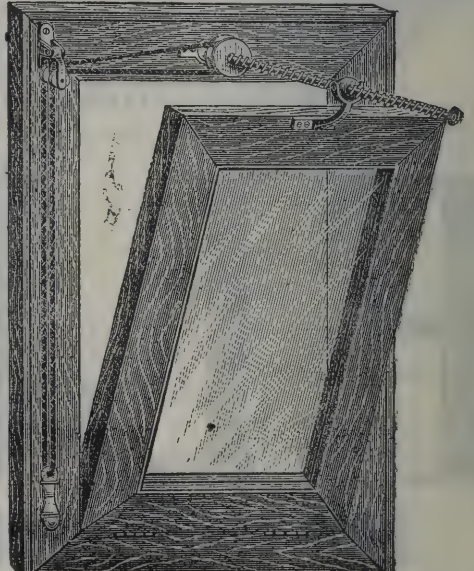


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For opening, closing, and securely fastening Fanlights, Casements, Skylights, &c.



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	All Brass	7s. 6d.
	Brass Wheel, Iron Fittings	
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	All Brass	
	Brass Wheel, Iron Fittings	10s.

This thoroughly efficient Screw Adjustment provides for opening, closing, and securely fastening Fanlights, Casements, &c., and will by its extreme simplicity commend itself to Architects, Builders, &c.

Working Models of the above and other Specialties may be seen at our new Show-Rooms, 57 HOLBORN VIADUCT, E.C. Architects and Builders are invited to inspect same.

AN hotel is to be built at Southend on the site at present occupied by the Switchback Railway. The plans have been prepared by Mr. F. Chancellor, of Chelmsford.

A CHAPEL-OF-EASE is about to be built in the village of Coulton, an outlying part of the extensive parish of Hovingham.

THE Town Council of Stratford-on-Avon have selected a site in Sheep Street for the erection of a fire-engine station.

A FREE reading-room has been opened at the Hampstead Public Library for the use of working men and women in the borough. The building has been given by a friend in remembrance of the late Miss Coates, of Upper Terrace Lodge. It is a large lofty room, erected by Messrs. Burford & Son from the designs of Mr. Horace Field, architect, of Church Row.

A NEW Board school at Colinton, designed by Mr. R. Wilson, architect, Edinburgh, has just been opened.

A SITE has been secured for the proposed new church of St. Aidan, in the School Lane district of Walton-le-Dale and Bamber Bridge, Preston.

VARIETIES.

THE New Public Buildings and Free Library, Oldbury, are to be opened on September 8.

THE head-masters of the Dundee Public Schools are to report to the School Board whenever the temperature in any room is below 50 deg.

THE Water Committee of the Liverpool Corporation have decided that the amount awarded in the arbitration of Newell *v.* the Corporation, as well as half the costs of the proceedings, shall be paid.

THIS week, at Clacton-on-Sea, a number of building plots were put up to auction, including an hotel site on the Marine Parade. This found a purchaser at 2,000*l.*, and the aggregate of the sale reached 3,400*l.*

THE first sod of a new reservoir to be constructed in the Wessenden Valley has been cut by the Chairman of the Waterworks Committee of the Huddersfield Corporation. The reservoir will cover an area of 41½ acres, and will be capable of containing 400 million gallons of water.

THE Stockport Town Council have consented to the transfer of the Technical School to the Corporation. The liability incurred will be 1,000*l.* a year.

PLANS have been prepared by Mr. C. C. Hooley, C.E., of a main-drainage scheme for Irlam and Cadishead, of the Barton Rural Sanitary District.

IT has been decided by the Manchester City Council to apply to the Local Government Board to sanction the borrowing of 150,000*l.* for the purpose of carrying out the electric-lighting scheme of the Corporation.

AT the meeting of the Town Council, Burton-on-Trent, it was agreed to relay the sewer in Guild Street, at a cost of 3,000*l.*, Messrs. Bass & Co. agreeing to pay 1,000*l.* towards the cost on condition that the Corporation gave up their right to go along the company's middle yard. It was reported that steps were being taken to press forward the introduction of the electric light, but it was stated that probably the light would not be in use through the Corporation until the winter of 1892.

IN the report of the sanitary condition of Glasgow just issued it is recorded that a large service is still being given by the Department in the testing of drains and soil-pipes; 2,216 smoke tests were applied during this year. Out of 836 tests applied for the first time to occupied properties only 105, or 12½ per cent., were found satisfactory.

THE *Irish Times* of the 1st says:—Mr. B. Colles Watkins, the secretary of the Royal Hibernian Academy, leaves town to-night for the County Kerry, where he will be engaged during the autumn upon several important works. Mr. James Brenan, R.H.A., has preceded him on a visit to the same district of Ireland.

A CORRESPONDENT writes:—I lately visited O'Connell's birthplace, and was astonished to find it roofless, walls fast crumbling to decay.

THE LONDON COUNTY COUNCIL AND NEW ROADS.

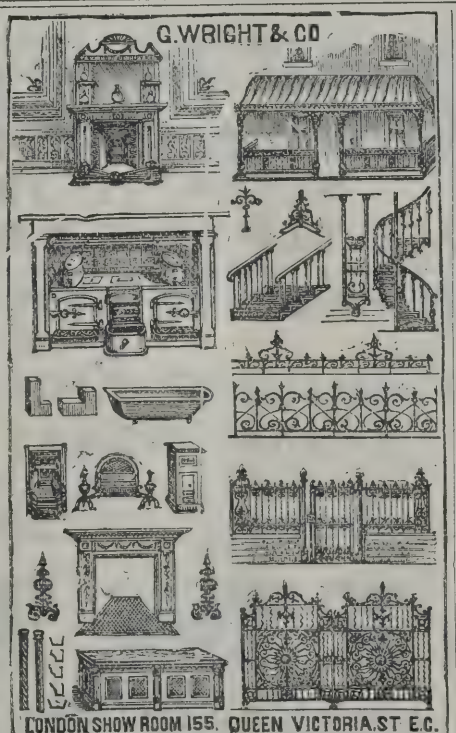
LAST week, at the North London Police Court, Messrs. James Edmondson & Son, builders, of North Holme, Highbury, were summoned before Mr. Haden Corser, at the instance of the London County Council, for unlawfully laying out a road, passage or way, known as Newington Turning, as a public carriageway in "such a manner that such road, passage or way would not directly communicate at both ends with a public carriageway," contrary to the 53rd and 54th Vic., cap. 243. Mr. Buckmaster, barrister, appeared for the County Council, and Mr.

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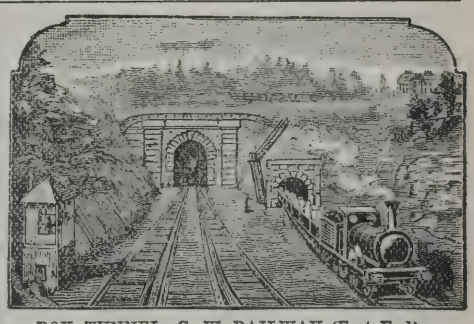

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Glen was counsel for the defendants. Mr. Buckmaster said that Newington Turning was a footway which ran from Aberdeen Road to Highbury New Park. The defendants had laid out one portion of this turning as a carriageway to the required width of 40 feet, but they had failed to make the whole of the footway a carriageway. For the defence it was shown that the portion complained of was only a portion of a scheme for covering the estate with houses, and that when the estate was finished Newington Turning would be intersected by another carriageway or road, which had already been staked out. Mr. Glen said that the Council's contention was that no single house could be erected unless the whole of the estate roads were made up and opened. Mr. Corser said that the Council had not made out their case, and he dismissed the summons with 5*l.* 5*s.* costs. Notice of appeal was given.

TIMBER-TESTING IN AMERICA.*

THE Division of Forestry of the United States Department of Agriculture has commenced a series of examinations and tests of American timbers, which far exceeds in magnitude and in scientific thoroughness anything ever before undertaken in this direction. There are three departments of the work.

I. *The Selection of the Timber.*

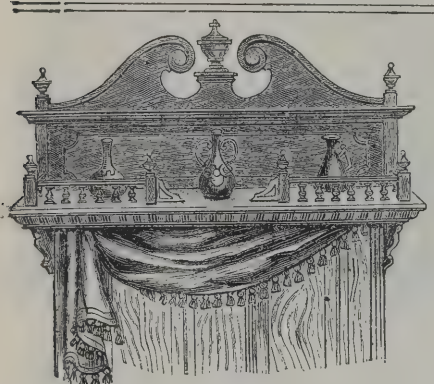
The trees to be examined and tested are first selected by a competent botanist and forester from five or more localities, four large trees of a given species from each place, these sites differing from each other as much as possible in climate and soil conditions. These trees are cut up into logs from 6 to 18 feet in length, with intervening discs 8 inches long. A complete record is kept of the botanical names, conditions of growth, time of cutting, age of tree, size, height, &c., and the north and south sides of each log and disc are marked on them, together with the number of the tree and of the log. The logs are shipped to St. Louis, and the discs are sent to Ann Arbor, Mich. Discs are also cut from younger trees and sent to Ann Arbor.

II. *The Physical Tests.*

The physical tests are carried out at the Washington University Testing Laboratory, St. Louis, under the direction of the writer. The logs are first sawed into appropriate sizes at an ordinary saw-mill. Each log is marked off on its end by a stencil-plate, in such a way as to obtain a series of 4-inch by 4-inch sticks in a north and south zone, and as large a stick alongside as the log will allow, up to 8 inches by 16 inches. Each stick is marked with a die with the number of the tree, the number of the log in that tree and the number of the stick in the log, the numbers being on the lower end of the log, and reading upright when the north side is upward. In this way each stick carries a legend which cannot be effaced, which fully identifies it. A series of stamps, corresponding to the stencils, is used to show in the note-book the way in which the log was cut and marked. After sawing, the sticks are carefully stacked under shelter to await the tests. In the course of from one to three months, after sawing one end (half) of each 4-inch by 4-inch stick is tested, and also some of the large sticks. The regular tests are as follows :—

1. *The Cross-bending or Beam Test.*—In this the load is always put on at the same rate, so as to produce an increase in the deflection of one-eighth inch per minute, and continued uniformly up to rupture. The simultaneous loads and deflections are read off about eight or ten times during the test, the scale-beams always being kept balanced and the deflection read off by means of a micrometer screw on the small beams, and from a thread over a paper scale on the large beams. The 4-inch by 4-inch sticks are tested in lengths of 60 inches between knife edges, all bearing-surfaces being protected by iron plates. The machine used was specially designed for this kind of work, and was described in the *Engineering News* of September 14, 1889. The large beams are broken on a machine of an original design, consisting of a hydraulic cylinder, plunger, screws and cross-head, made by Riehlé Bros., and similar to those parts used in their 100,000 lb. testing machines. The base or beam part of the machine consists of two long leaf-yellow pine sticks, 6 inches by 20 inches by 24 feet long, both being clear, straight-grained wood. Between these there is a steel flitch plate, $\frac{3}{4}$ inch by 18 inches by 20 feet long, all bolted together through their neutral axes. The weighing is done in a standard 100,000 lb. Riehlé machine near by, both being connected up with the same pump, and the weighing-machine being blocked. The plungers of the two machines are of the same size, and therefore, except for the difference in the frictional resistances of their plunger packings, they should show the same loads for the same unit pressure in the pump. They have the same kind of leather cup-packing, and, when tested by

* From a paper by Professor J. B. Johnson in *Engineering News*.



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nests of calibrating springs, they show equal loads for equal deflections of springs. These calibrating springs were first tested on the Emery machine at the Watertown Arsenal, and hence both these machines are now standardised with that one. Since this large beam machine will place a load of 100,000 lb. on a beam 24 feet long, there has probably never been a wooden beam or a rolled iron or steel beam which could not be broken on this machine if taken in a length from 20 to 24 feet. This is also the only beam machine of large capacity with which the writer is acquainted. There are following nuts placed on the power screws, by means of which any given deflection can be held, and in this way time tests can be made on large beams. From the plotted results, loads and deflections, the modulus of elasticity and the total resilience of the timber up to the point of maximum loading in inch-pounds per cubic inch of timber are computed in addition to the strength.

1. *The Percentage of Moisture.*—After breaking the beam, it is next bored through 18 inches from each end, and one-third the width of the stick from one side, and the borings used for determining the percentage of moisture. Professor Bauschinger has shown that when the moisture in a stick falls below 20 per cent., and especially when below 15 per cent., the strength increases very rapidly as the moisture diminishes.

3. *Specific Gravity and Width of Annual Rings.*—The ends of the broken beam are now cut off, and used for making the other tests named below. One of these is weighed and measured, and the specific gravity determined. The number of annual rings is also counted in a radial direction across the stick, and the average number per inch is recorded.

4. *Crushing Endwise.*—From each 4-inch by 4-inch stick there is cut a section 8 inches long, and from each large beam there is cut a column 40 inches long and 4 inches by 4 inches in cross section, and these are tested in compression endwise until the fibres are crushed down and the maximum load passed.

5. *Crushing Across the Grain.*—From each beam there is taken a section and crushed across the grain on an area 4 inches by 4 inches. The maximum load is found to occur when the compression is about 3 per cent. of the height, and hence this amount of distortion is taken as the standard and the compression load found at this limit, which is also considered a reasonable limit in practice.

6. *Tensile Tests.*—The tensile strength is found by taking a piece 1½ inches by 2½ inches by 15 inches long, and cutting it down on circular curves to ⅜ inch by 2½ inches at the centre and then pulling it on the 100,000 lb. Riehlé machine. It is held between the ordinary flat wedge-shaped grips. It is very difficult to break timber in tension, but after trying various shapes and methods of holding, the above was found most simple and entirely satisfactory.

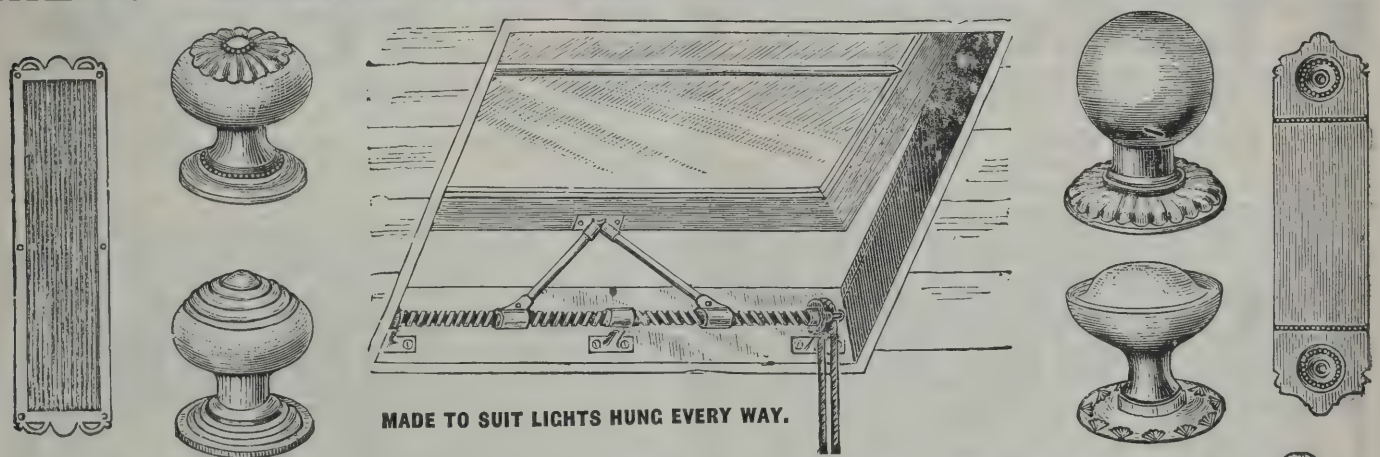
7. *Shearing Test.*—The shearing strength is found by pulling out the ends of slotted holes. A piece 2½ inches square is slotted 1 inch from each end, with a hole ¾ inch by 1 inch. Steel pins are inserted in these and pulled by means of suitable stirrups. The two holes are cut at right angles to each other and both are pulled out, thus getting the shearing strength both ways with reference to the direction of the annual rings. The stick is kept from spreading, or splitting out, by means of hand clamps which are put on outside the slotted holes and screwed up to a bearing before the test begins, the initial pressure being only a few pounds.

In all the above tests the direction of the rings is sketched in and the records show also its exact position in the log and in the tree, so that all known pertinent facts are recorded. It is only in this way that the laws governing the strength of timber can be found. The reserved sticks will be tested some two years or more later after seasoning, which will be under shelter. There will probably be as many as 2,000 tests made on each of the more important species of timber, and when these are properly collected and discussed it is thought that little will remain undiscovered in regard to the conditions governing the strength of sound timber of all the common varieties. The work has begun with the Southern yellow pines and oaks, six carloads of logs having been received and sawed to date. Since one large stick is cut from each log, and at least two small ones, the relative unit strength of large and small timbers will be determined. The effects of knots, windshakes, seasoning cracks, &c., are also sure to be determined.

Tests of old Timbers.

It is often very desirable to know the strength of old bridge timbers, which, though apparently sound, are more or less cracked along their neutral axes, and have been in service many years. If railroad and bridge engineers choose to send in such timbers full size, just as they have been used in the structure, they will be tested promptly and at a very small cost. A few tests of this kind would go a long way toward educating the judgment of a chief or of an inspecting engineer who may

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be charged with the responsibility of deciding when to replace an old structure with a new one.

III. *The Microscopic and Structural Examinations.*

The specimen discs sent to Ann Arbor, Mich., are examined and studied by competent botanists of the University of Michigan, and photographs taken of the structural formation. The article is, however, for the information of engineers and architects rather than of botanists, and hence is mostly taken up with a description of the physical tests. This work will run for many years, if sufficiently supported by public opinion, on which all State work really rests. If it is continued in the same scale of thoroughness with which it is begun, it is impossible to overestimate its value, both to timber users and to timber growers, for one of the ultimate purposes is to learn the conditions most favourable to the profitable growth of the more valuable kinds of timber. Neither are the results of these studies of most immediate use to engineers and architects, but the carriage, waggon and implement makers, car-builders, furniture manufacturers and the public generally are equally interested, since it is only the needs of the public which all these are trying to serve.

ROYAL VICTORIAN INSTITUTE OF ARCHITECTS.

THE following is the text of the presidential address of Mr. George C. Inskip, F.R.I.B.A., at the annual meeting held in Melbourne, July 6, and of which we gave a short summary in a previous number.

The President said :—Following a time-honoured custom I now have the privilege of addressing you. As the last president of the old Institute and first president of the incorporated Institute, I have occupied this chair at a time when great changes have been brought about. Your Council have been called upon during my term of office to undertake a very large amount of work, and to devote a considerable amount of time to the affairs of the Institute, but they have one and all cheerfully undertaken this work, having the welfare of the profession at heart. To show that their labours have not been in vain I would point to the incorporation of the Institute, to the very large increase in the number of our members, to the large amount of interest that has lately been taken in the affairs of the Institute, and also to the anxiety displayed by architects in this as well as the neighbouring colonies to gain admittance to our ranks. New rooms have been leased and furnished, a library started, and upon the table of our reading-room may now be found many of the leading architectural papers of England and of the continents of Europe and America. Many instructive papers have been read during the year, and visits have been paid to several of the principal buildings and manufactories in the city. Our meetings, which at one time were held quarterly, are now held every month, and they have never before been so well attended. The first examination in architecture to qualify for admission as associate was held during the first week in May last, when four candidates presented themselves. It was not expected that a large number of students would come up for examination, and this number must be considered satisfactory to start with. Out of this number two passed. The gold medal was not, however, awarded by the examiners, as they did not consider the work done reached the required standard. The gold and silver medals awarded during 1888 and 1889 were presented at a meeting held on May 4 last. Mr. Annear was awarded the gold medal of the Institute for the best essay upon Gothic architecture, and Mr. Lewis the silver medal for the same subject. Mr. Buick was also awarded a silver medal for the best design for a block of city offices. The reading up required for the essay prizes must have been of great value, and I feel sure that each competitor reaped a vast deal more than the value of the medals in the experience gained by the work done for the purpose of obtaining them. The difficulty of getting suitable dies executed in the colony was the cause of the delay in presenting these medals. Your Council, some eighteen months back, decided to entrust the work to Mr. A. Wyon, the celebrated London medallist, and he has carried out the work in a satisfactory manner, and provided medals worthy of our Institute.

The most important matter that has occupied the attention of your Council has been the Registration of Architects Bill. It was considered that the public interest would be served by provision being made by Parliament for preventing other than skilled persons from practising architecture. For this reason the Registration Bill has been brought forward, and I feel that it ought to receive the support of every right-thinking person in the community. The Bill has been framed upon a liberal basis, admitting as registered architects all who now possess even doubtful claims, so that the future may be made secure against unqualified practitioners. The benefits to be derived from registration would be that in the future all members of the profession would have undergone a similar training, and all

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would be registered and form one united body. Mr. R. Best, M.L.A., has kindly taken charge of the proposed Bill, and from his known energy in all matters that he undertakes, I feel sure it is in good hands.

Your Council have under consideration the advisability of endeavouring to induce the Government to call for competitive designs for all public buildings costing 5,000*l.* and upwards. The Government of New South Wales have already adopted this course, but in view of the constant complaints made by our members respecting the mode in which architectural competitions are generally decided, we think it would not be advisable to approach the Government until such time as satisfactory rules regulating competition have been drawn up and adopted. We have been for some time past in correspondence with the various institutes of architects in the other colonies with the object of drawing up conditions that would regulate architectural competitions throughout Australia, and I trust our endeavours may prove successful.

The Builders and Contractors' Association having expressed dissatisfaction with the present conditions of contract, it was decided to meet members of that Association in conference. Two very lengthy meetings have been held, and the matter discussed in a very friendly spirit. As the result, I hope we shall before long be able to lay before you such amended conditions as will be satisfactory both to architects and contractors.

The long-talked-of drainage of Melbourne will, I trust, shortly be taken in hand by the Board of Works. As soon as this undertaking is started there will be an immense amount of work to be done in connecting our dwellings with the main sewers, which work will require the most careful attention of architects. If this part of our sewerage system is not properly and scientifically carried out, the danger to health will be much greater than under our present disgusting system. I therefore think that it is of the utmost importance that a consulting architect should be appointed to advise the Board in all matters relating to buildings.

From the late census it appears that the population of Melbourne has now reached 500,000. The people from the country districts are more and more drifting to this great centre, and there is therefore great need for stringent regulations regarding the erection of dwelling-houses, and the laying out of new streets. Over-legislation is to be deprecated, but a new Building Act is a necessity, framed so as not to unduly interfere with building operations, but an Act that would insure the erection of none but healthy dwellings, and also well laid out and properly drained streets. It is also absolutely necessary that some regulation should be in force that would put a stop to the erection of such death-traps as may be found by the hundreds in the various suburbs in this city. I also think there should be some limit put upon the height of buildings. I think that the width of the street should to a great extent govern the height of the building, as is the case in France, Germany and Sweden. The erection of ten and twelve storeyed buildings greatly increases the risk by fire, and they also dwarf the many well-proportioned buildings in their immediate neighbourhood, and make both appear ridiculous. No matter how skilfully these lofty buildings may be designed (and I must confess that some of them have been cleverly designed and constructed), they most certainly are a disfigurement to the streets. Melbourne has plenty of room for extensions without crowding all its principal buildings in one particular street, so that there is no necessity for such lofty structures, which, in addition to the increased risk by fire, also shut out the sunlight. To have the sunlight excluded for a couple of months in the summer might be an advantage, but for the greater part of the year it is most certainly detrimental to health. While speaking of buildings and building lands, I think it should be made compulsory, where land is being cut up for building purposes, that the roads should be first formed and the drains laid down before any buildings are allowed to be erected. If we look around the various suburbs it will be found that this course has in many cases not been adopted, and after the roads have been made the floors of the dwellings are found below the street-level. In laying out new streets they should also be so planned that good sites may be provided for important public buildings. If this had been done when our present streets were being laid out, our Parliament Houses would not have been shut in as is at present the case.

A great deal has still to be done in the wider streets of the city by the planting of trees. In a climate like ours it is an immense advantage to have plenty of shade. Trees would add greatly to the beauty of our streets, and at the same time have a pleasing effect upon our buildings. Melbourne is far behind the cities of Europe in this matter, and also in the matter of statuary. I trust this will not long continue, but that our principal open spaces and gardens may be adorned by the work of the sculptor.

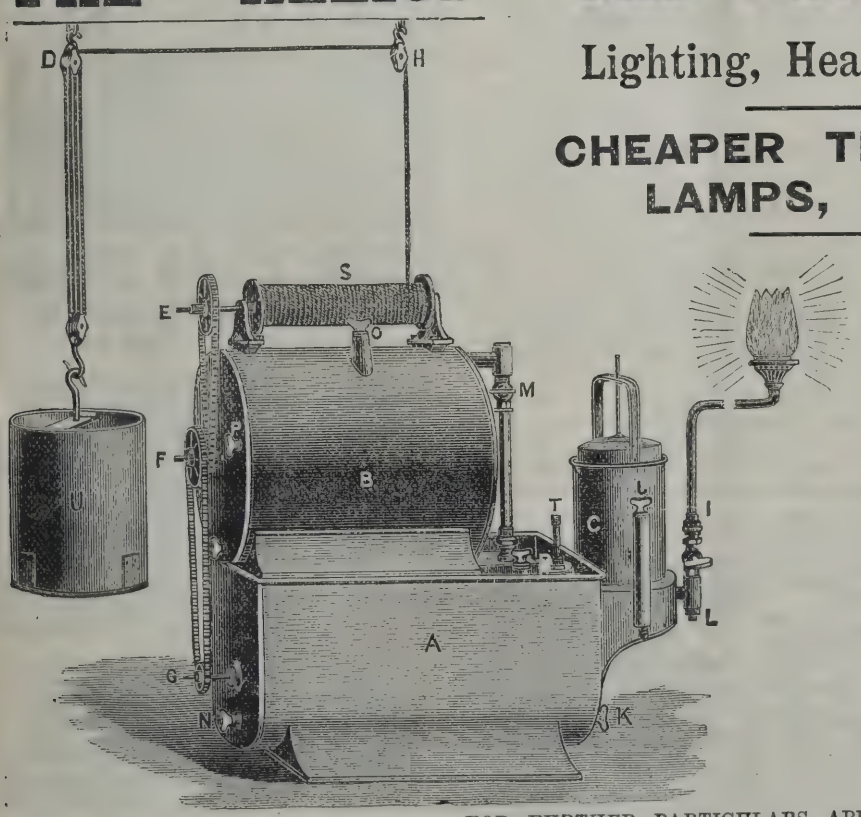
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be erected. The Building Act should be so framed as to put a stop to the erection of such buildings. The housing of the working classes is a matter of vast importance. At present they are compelled in many instances to dwell in the shoddy houses erected by greedy speculators without proper drainage or ventilation. The rent of these death-traps being also excessive, I would suggest to our capitalists the forming of a company for the erection of artisans' dwellings on strictly sanitary principles. I feel sure money so invested would pay handsome dividends, and at the same time a blessing would be conferred upon the working classes.

The Architectural Association lately formed in this city is, I understand, established upon similar lines to the British Architectural Association, for the purpose of giving architectural students and draughtsmen an opportunity of meeting together for mutual instruction. The Association in England is under the wing of the Royal Institute of British Architects, and I am sure this Institute will, so long as the Melbourne Association is conducted on similar lines, be always ready to give it every support and encouragement. I would point out that under the new qualification of probationer pupils and draughtsmen they can now join our ranks and have the privilege of attending our meetings and lectures, and also have the use of our reading-room and library.

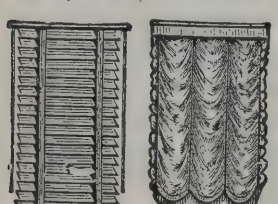
A great deal has lately been said about the formation of an Australian Institute of Architects. I feel sure that it would be to our mutual advantage if all the qualified architects in Australia were united in one powerful corporation. I am sure we would gladly meet representatives from the various colonies, and endeavour to bring about this wished-for result.

The collapse of the land boom and the late disastrous strike did much to interfere with building operations during the past year. Notwithstanding these drawbacks, our members have been fairly busy, and several important buildings have been commenced and several completed—amongst others the new Stock Exchange, St. Paul's Cathedral, and the Australian Buildings, all the work of members of this Institute. I have noticed with pleasure that architects have of late given a little more attention to internal and external decorations, and several important buildings have lately been decorated with admirable taste. In a climate like ours it is surprising to me that more attention has not been given by architects to the effects to be obtained by the judicious use of colour in the external decoration of our houses. We are not all possessed with the gift of producing harmony of colour, but I think we might, as lately remarked by Mr. Waterhouse, the president of the Royal Institute of British Architects, endeavour to give more expression to our buildings by the judicious use of colour, and so add greatly to the effect of our designs. We have in these colonies a great variety of beautiful woods, admirably adapted for decorative work, which I am sorry are not more generally used. The prospects of the profession for the coming year are, I think, fairly encouraging, and I trust the present depression may soon pass away. In looking round at the old and dilapidated buildings occupying important sites in our principal thoroughfares, I feel sure they will before long have to make way for handsomer and more commodious structures, giving employment to the architect for many years to come.

We have in this colony a large number of highly-trained and educated architects, but I am sorry to say up to the present the educated architect has not received from the public the encouragement he is entitled to, and which he receives in the older countries of Europe. I trust, however, our endeavours to raise the standard of architectural education may do much to point out to the public the important position the architect holds. I am sorry to say the majority of the public are still contented to employ ignorant and unqualified men. I therefore wish to point out the immense advantage to health and happiness of living in well-planned, ventilated houses, with good sanitary arrangements, and to gain this end it is absolutely necessary to employ educated men to design them. There can be no doubt that a great deal of the sickness in our midst has been caused by the badly-built, badly-drained and badly-ventilated houses that so many people are contented to live in. The scheme of examination lately adopted by the Institute will, I trust, do much to raise the status of our profession and gain for our members the confidence and respect of the public, and show that we are worthy to occupy a leading position amongst the other learned professions. The Melbourne University provides a well-equipped civil engineering school, to which should be most certainly added a school of architecture, so that our young men could obtain a thoroughly scientific training. The worthy Chancellor of the University has always shown himself to be a lover of the noble profession of architecture, and we must look to him to assist us in this matter. I therefore trust that the promised chair of architecture may be established without delay, and that the degree of bachelor of science in architecture may be one of the degrees to be conferred. I also trust, seeing the large amount of wealth that has been accumulated by so many of our citizens, that some one may be found

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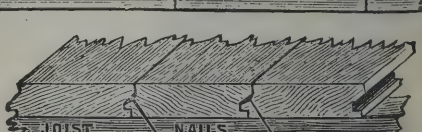
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public spirited enough to endow a chair of architecture and also travelling scholarship for architectural students. The reason so many of the buildings of the Middle Ages are monuments which we now look upon with pride and admiration, and which display the skill of the old architects, appears to me to be that the practice of architecture in the Middle Ages was a profession pursued only by the educated and carried out in what was then the seats of learning—the monasteries. If the practice of architecture in the past was in the hands only of educated men, why should we not in the present day insist that none but educated and trained men should be entrusted with the erection of our buildings, which have so much to do with the health and the happiness of the whole community? The vast amount of influence architecture has always exercised upon the tastes and manners of the people must be admitted by all. It is the architect who gives to future ages the history of society at the time his building was erected. The architect is, and must always continue to be, the educator of the public taste, and it is, therefore, of the utmost importance that those who are to be looked up to as guides in matters of art should be specially trained and educated. We cannot all be a Michel Angelo or a Christopher Wren, but if our architects are specially trained and educated we may hope to hand down buildings that may be looked upon with pride by those who are to come after us.

As a corporate body, the Institute is now placed upon a firmer footing than it ever has been since it was established upwards of twenty years ago, and it is also in a much better position to look after the interests of the profession. I would like to say a few words respecting the duty every member owes to the Institute. We should all remember the object for which it was established, viz.—"The advancement, protection and elevation of architecture as an art, and the cultivation of friendly intercourse between its members." I feel that the Institute is now upon a firm basis, and I trust, gentlemen, you will still continue to take a deep interest in its affairs, and that you will often avail yourselves of the opportunity now offered of frequently meeting together in a friendly way, and so cement that good feeling which should exist between us as professional men engaged in the same work. I would also impress upon you all the advisability and necessity of unity amongst ourselves, and of honourable conduct in all our dealings, and so by our actions show that we are worthy to represent the noble profession of architecture in this colony. Before sitting down, I must thank you for the consideration and kindness uniformly extended to me during my term of office, and also express my best thanks to all members of the Council for the kind manner in which they have upon all occasions assisted me in carrying on, I may say, the laborious work of the past eighteen months. To our worthy hon. secretary, Mr. Billing, I wish to express my sincere thanks for the large amount of time he has devoted to the affairs of the Institute, and the very able manner in which he has assisted me in conducting our business. I must also thank our hon. treasurer, Mr. Purbrick, for his valuable services, and also those gentlemen who so ably acted as examiners at our last examination. Our thanks are due to our late secretary, Mr. D. R. Stewart, and to our present secretary, Mr. Cunningham, who has carried out his duties in a very satisfactory manner. I thank you, gentlemen, very much for the attention you have given to my address. I am afraid I have not been able to say anything new, or have I been able to address you so eloquently as some of my predecessors, but I can assure you I have during my term of office been actuated by one desire only, and that was to maintain the honour of the profession, and to advance the welfare of the Institute; and in the future my single object will be to continue by every means in my power to advance the interest of the noble profession to which I have the honour to belong. I can assure you I shall always look upon it as a great honour to have been considered worthy by my professional brethren to occupy the proud position of President of this Institute.

A vote of thanks was accorded by acclamation to Mr. Inskip for his address.

EDINBURGH WATER SUPPLY.

THE text of the engineers' (Messrs. Gale, Hill & Mansergh and Messrs. Leslie & Reid) report on the proposed additional water supply for Edinburgh and district, has been published in the *Scotsman*. The adoption of the Manor scheme is recommended in point of quality. For 15 million gallons per day the total outlay is set down at 842,440*l*., or by an alternative scheme at 873,005*l*.

Manor Scheme.

The Manor Water, the report states, is a large tributary of the river Tweed, and joins that river about two miles above the town of Peebles. The hills bounding the watershed proposed to be appropriated vary from 2,200 feet to 2,600 feet in height, and the drainage area consists principally of mountain pasture interspersed with rock and *débris* and is practically free from

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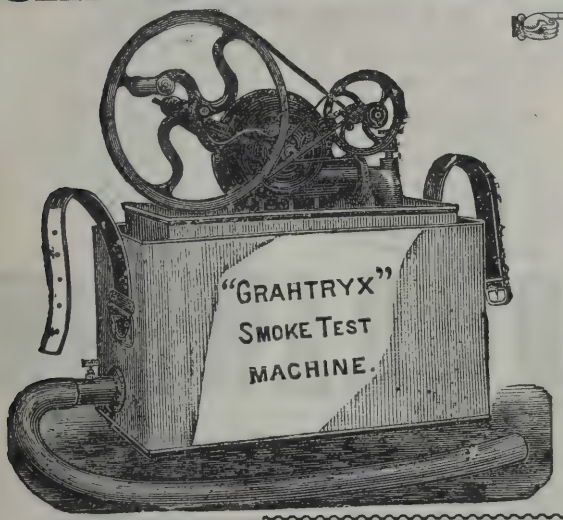
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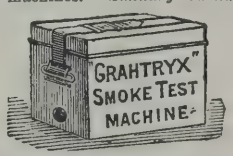
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cultivation. The water in the streams was on the occasion of both visits bright, clear and free from stain. The rainfall is large, and the average available rain of three consecutive dry years will probably be about 26 inches per annum. The total drainage area which can be utilised is 13,720 acres, which, after providing compensation water to the stream, will yield a supply of about 15 million gallons per day for the city. The valley is favourable for the storage of water, and the necessary storage can be provided by the construction of two large reservoirs—one on the Manor Water at Posso, with a top water level of 894 feet above ordnance datum and a capacity of 2,703 million gallons, to be formed by an embankment of a maximum height of 92 feet; the other on the side valley on the Hundleshope Burn, with a top water level of 727 feet above ordnance datum and a capacity of 1,345 million gallons, formed by two embankments, one at each end of the reservoir, of about 52 feet and 38 feet in height respectively. The storage thus provided is sufficient to maintain the supply to the city and furnish the compensation water for a period of 180 days. The surface area of the two reservoirs will be about 450 acres to a drainage of 13,720 acres, or about 1 to 30. The scheme can be conveniently carried out in two sections. The first section would consist of the construction of the Posso Reservoir of the size already mentioned, which will receive the water from a drainage area, including the Glenrath Burn, of 9,310 acres. The supply thus obtained for the city, after providing compensation water, will be about 10 million gallons per day. The second section of the scheme would consist of the construction of the reservoir in the side valley on the Hundleshope Burn, to which there would be a drainage of 4,410 acres, including the drainage to the main stream below Posso, to be conveyed to this reservoir by an aqueduct about one mile in length. The Hundleshope Reservoir will provide the compensation water for the whole drainage of 13,720 acres. The Posso Reservoir would thus be wholly available for the city, and the supply to be obtained would be about 15 million gallons per day. The water would be conveyed from the Manor Valley to Alnwick Hill, a distance of about twenty-five miles, by an aqueduct, consisting of tunnel, cut and cover or built aqueduct, and cast-iron piping across the valleys. The aqueduct would cross the Tweed at Manor Foot, and follow the west side of the Eddleston Valley through the ridge at Leadburn by tunnel, thence alongside the Peebles Railway to the line of the Moorfoot pipe and on to Alnwick Hill. The estimated cost of the first instalment of the work for 10 million gallons per day for the city, including land and contingencies, with tunnel and cut and cover aqueduct for 24 million gallons per day and one line of pipes for 15 million gallons per day, will be 602,364*l.*, and for the second instalment of 5 million gallons per day 240,076*l.*, making a total outlay of 842,440*l.* for the 15 million gallons of water per day. For the purpose of comparison with the other schemes we have made an estimate for a first instalment from the Manor of 8 million gallons per day, which amounts to 568,079*l.*, and the completed scheme for 15 millions by the method of dealing with it will cost 873,005*l.* This includes tunnel and cut and cover aqueduct for 24 million gallons per day as before, but with a pipe to convey only 8 millions per day, and deducting the diversion of the Glenrath Burn, as the Posso drainage alone will give this quantity. The Manor Water is the nearest of the three schemes to Edinburgh, and is one of the best waters to be obtained. It has previously been looked upon as a likely source of future supply for Edinburgh, and was reported upon by the late Mr. Leslie in 1870. The Mid-Lothian Water Company in 1873 obtained an Act for supplying the districts round Edinburgh from this source, with power to sell to the trustees, and the rights of the company were purchased by the trustees in 1874, at the time the Moorfoot scheme was before Parliament. The powers under the Act of the Mid-Lothian Water Company taken over by the trustees have, however, lapsed. The town of Peebles, with a population of about 4,000 persons, obtains a portion of its supply from the Manor Water, near Posso, by means of a cast-iron pipe 7 inches diameter. The quantity required by Peebles from the district is, however, so small that it can scarcely be said to affect the consideration as to the further water supply for Edinburgh and district being taken from the Manor. There should not be any difficulty in making a satisfactory arrangement with Peebles as to their existing supply, or as to any further quantities of water which may be required by that town in the future. If the city should increase so as to exhaust the supply from the Manor Water, additional supplies can be obtained from the upper waters of the Tweed, and with this view the tunnels and the cut and cover aqueducts have been made for a quantity of 24 million gallons per day.

Tweed Scheme.

A scheme for obtaining a large supply of good water can be laid out in the higher reaches of the Tweed valley. The streams proposed to be utilised for the purpose are the Talla Water, with Gameshope Burn, the Menzion Burn and the Fruid Water. The drainage area which can be made available on these streams

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is 12,175 acres—the hills surrounding rise to a height of considerably over 2,000 feet—and as regards the Talla the ground is of very much the same character as described for the Manor scheme, but in the Fruid the drainage area is less favourable. The rainfall of this district is large, and in three consecutive dry years may be taken at an average of about 32 inches per annum as available. This upon the drainage area of 12,175 acres will yield a supply of 16 million gallons per day for the city after providing water compensation. There are very good sites for the construction of large storage reservoirs. Two reservoirs would be required—the one on the Talla Water, with a top water level of 965 feet ordnance, to contain 2,473 million gallons, which is provision to receive the water of the Menzion drainage, would be formed by an embankment about 75 feet high, placed across the stream some two miles above its junction with the river Tweed; the other on the Fruid Water, with a top water level of 1,016 feet ordnance, and with a capacity of 1,837 million gallons, to be constructed by an embankment about 62 feet high across the stream about 1½ miles above its junction with the Tweed. The storage thus provided is sufficient to give 180 days of supply to city and for compensation. The surface area of the two reservoirs is 453 acres, to a drainage area of 12,175 acres, or about 1 to 27. It will be seen that the scheme readily divides itself into two parts—the first for adoption would be that including the Talla Water or Gameshope only, but providing storage sufficient for the Menzion Burn. The drainage to the Talla and Gameshope Burn is 5,524 acres, and the supply available for the city after providing compensation will be about 7½ million gallons per day. The second portion of the scheme will include the drainage of the Menzion Burn (to be stored in the Talla Reservoir) and the Fruid Water—the drainage area to these streams is 6,651 acres, and the supply available for the city after providing compensation, about 8½ million gallons per day, making a total supply of 16 million gallons per day. The total length of the conduit from the Talla Reservoir to Alnwick Hill would be about 36 miles. It would pass by Broughton and alongside the Edinburgh Road to Linton, and so on to Alnwick Hill. Where the aqueduct is in tunnel or cut and cover the estimate is for the conveyance of 24 million gallons per day, as in the case of the Manor, so that in the event of further supplies being required, no alterations in this class of work would be necessary. Where the aqueduct consists of piping this can be added to as occasion requires. The estimated cost of the first instalment of 7½ million gallons per day for the city, including land and contingencies, is 584,000*l.*, and for the second instalment of 8½ million gallons per day, 249,000*l.*, making a total of 833,000*l.* for the 16 million gallons per day. When the supply to be obtained under this scheme is exhausted, further water can be obtained from the drainage of the upper Tweed. Though the water of the Talla is of fine quality, the scheme as a whole would not produce such clear water as that of the Manor.

St. Mary's Loch Scheme.

The loch is situated on the head waters of the river Yarrow, which runs through Selkirk. It was at one time looked upon as one of the sources from which Edinburgh and its district might obtain further supplies of water. The scheme was considered by Parliament in the year 1871 and rejected. The elevation of the hills surrounding the drainage is much the same as before stated for the Manor and Tweed schemes. The natural drainage area to the foot of the loch is 27,500 acres, but we propose to divert the Kirkstead Burn, which now flows into the loch, because it discharges too near the outlet and is not required. This will reduce the drainage to the loch to 25,500 acres. The present area of the loch is 723 acres, and is 1 to 35 of the drainage area. There is a little cultivation on the side of the loch, and in some of the valleys on the main tributaries; but, speaking generally, the drainage area may be said to be free from objection, although there is apparently more peat upon this drainage than upon that of either the Manor, the Talla or the Fruid. There had been a rain a few days previous to our visit to the district last October, and its effect was to be seen distinctly in the water of the loch, which was stained. There is a large rainfall in the district, and we find that about 34 inches per annum may be taken as available. This would yield a total supply of 54 million gallons per day, which, after deducting compensation, would leave 36 million gallons per day for the city. We have dealt with the scheme so as to obtain about 15 million gallons per day for the city as in the Manor and Tweed schemes, with which it must be compared. To obtain this quantity of water and to provide the compensation water to the Yarrow, it would be necessary to construct an embankment and relative works at a point on the river a short distance below the outlet of the loch. The necessary storage can be obtained by raising the normal level of the loch 14 feet and lowering it 9 feet, thus giving an available storage of 4,700 gallons, which, under the circumstances, is, in our opinion, sufficient. A considerable area of land would be submerged by the raising of the loch, and a long length of road diversions

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would be necessary. The estimate for the works to be constructed at the loch, in the first instance, contemplates provision for additions being made to increase the storage at a future time for a further supply of water; such additional works would, however, be small, as the roads would, in the first instance, be laid out with this in view. The total length of the aqueduct from St. Mary's Loch to Alnwick Hill by the proposed route by Traquair and Peebles, is 35½ miles, consisting of tunnel, cut and cover or built aqueduct, and cast-iron piping. The estimated cost for the first instalment of 8 million gallons per day, with one line of pipes, is 765,000*l.*, including land, road, diversions and contingencies, and the construction in the first instance of the aqueduct, wherein tunnel or cut and cover for 24 million gallons per day, and for the additional instalment of 7 million gallons per day, 114,000*l.*, making a total of 879,000*l.* for a supply of 15 million gallons per day. The waters of the loch are at the present time utilised to some extent by the mill-owners having water rights on the river below; but it is probable that satisfactory arrangements could be made with the parties interested in such a way as not to prevent the carrying out of works to obtain a water supply from this district. The estimates have been carefully considered, having regard to the uncertainty of the labour market and other contingencies, and are ample. A tabular statement of the several schemes is appended to the report, showing the drainage areas, quantities of water to be obtained, and the estimated cost of works to Alnwick Hill, including land and contingencies, with the cost per million gallons per day in each case.

A GREAT CHINESE ROAD.

IN a recent memorial to the Emperor of China, the Viceroy, Li Hung Chang, describes the work which has been done to render passable one of the great trade highways of China. The pass leading from Nankow is one of the great thoroughfares connecting Pekin with Mongolia and the southern parts of the empire, and is well known to most visitors to the Great Wall, through which the road passes. The mountainous region in the vicinity was regarded by former dynasties as a barrier against invasion. It is now largely frequented by Mongolian princes and tribute missions visiting Pekin, while it is also the main route for the conveyance of mails and Government supplies to the north and north-western borders of the empire. For more than two hundred years it has never received any repairs on a large scale. Running for a long distance through high hills and precipitous cliffs, it became in summer and autumn a raging torrent, and in winter was a succession of frozen sheets of water which often proved fatal to man and beast. The pass came to be regarded with such dread by all travellers that some improvement in its condition was viewed as an absolute necessity. The great difficulty was one of expense, and as the exchequer of the province of Chihli shows an annual deficit, no assistance was to be expected from public funds. Four years ago a conference of the district officers was held, and inquiries were made amongst the elders and gentry of the neighbourhood, and public opinion was shown to be in favour of levying a contribution on passing animals for the repair of the pass. Offices were accordingly established, and a toll of from two to ten cash was collected upon all camels, mules, oxen, horses, donkeys and other animals passing up and down. Exception was, however, made in favour of horses on Government service returning without a load, as also of all beasts of burden carrying firewood or agricultural implements. But, having regard to the large quantity of stone and other materials required for such a vast work, it was found that the proceeds of the contributions from baggage animals were not large enough to warrant its being undertaken at once, and it was, therefore, thought advisable to carry it on gradually in sections. A commencement was made, and it was not very long before the pass was reduced to a fairly level condition suitable for cart traffic, and then the contributions were considerably increased by imposing a levy upon vehicles. The work that remained to be done was still enormous. Hollows had to be filled up, heights had to be levelled down, and in some places a long detour had to be made and an entirely new road constructed. To defray the cost of keeping the pass in proper repair it is proposed to continue the levy upon animals for several years until the proceeds reach the sum of 2,500*l.*, when it will be discontinued. Similarly, the tax upon vehicles will be continued until 1,000*l.* has been collected. Both of these sums it is proposed to place out at interest to keep the road in good repair.

NOTES ON NOVELTIES.

MESSRS. SHANKS & CO., of the Tubal Works, Barrhead, Glasgow, whose name has now so long been associated with excellence in regard to sanitary appliances, have just carried out works at Balmoral Castle. The accompanying illustration

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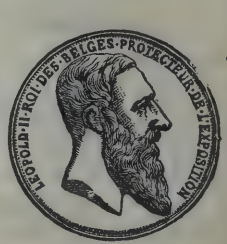
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75 Newman Street, Oxford Street, W.: Feb. 15, 1887.

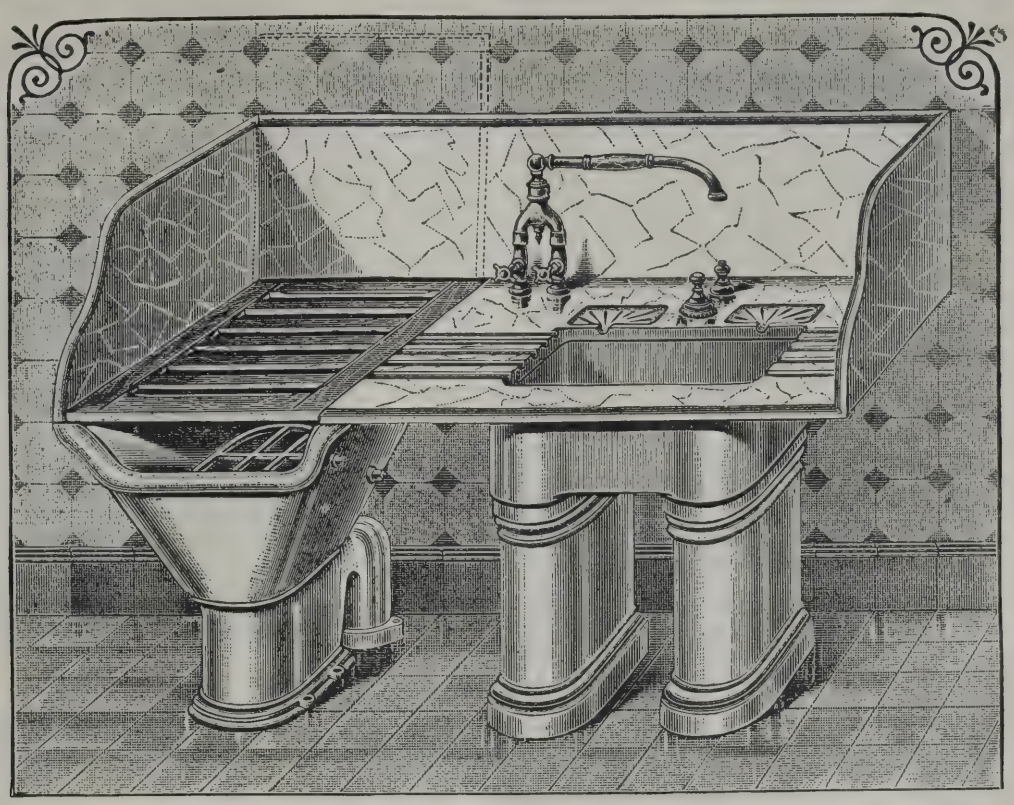
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shows a fine specimen of a wash-up and slop-sink, which Messrs. Shanks & Co. have recently executed for Her Majesty the Queen. The design was specially prepared at the request of Her Majesty's agents, and Balmoral Castle is now fitted with two handles shown behind the wash-up sink. The lower grating of the slop-sink is nickel-plated brass, and the upper one is of teak-wood, both being hinged. The wash-up sink, also of white-enamelled fireclay, is fixed on two pedestals of the same



sinks to this pattern. The slop-sink, which, with basin and trap, is made in one solid piece of white-enamelled fireclay, has a perforated rim all round the edge of the basin, and is flushed by means of a large inlet-valve, actuated by the smaller of the material. It is made on Shanks's patent principle, with standing waste and overflow, the waste-pull being the larger of the two handles shown at the back of the sink. The slab and skirting is, by preference, of St. Anne's marble.

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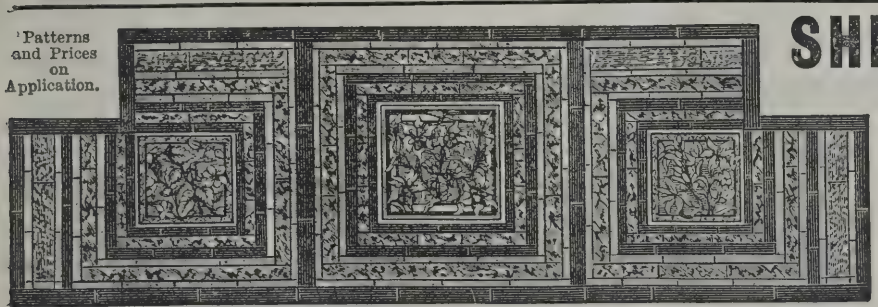
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PORT OF NESS HARBOUR.

PLANS have been prepared at the office of Messrs. D. & T. Stevenson, Edinburgh, for extensive alterations at the harbour of Port Ness, Lewis. The existing basis was built six or seven years ago by the Fishery Board, at a cost of 6,000*l.* It has proved an immense benefit to the district. Around the Port of Ness the hardiest and most enterprising fishermen on the West Coast reside, and the only natural advantages which they enjoy in the pursuit of their calling are a sandy beach and an eastward bend in the coast, which affords a scanty shelter from the north wind, which brings tremendous rollers down from the Butt. The basin, built of concrete, at the angle in the coast, has sheltered the boats of the whole district in rough weather, but unfortunately the entrance got silted up with sand a couple of years ago, so that boats could enter only at the top of the tide. The West Highland Commission visited the place last April, and were greatly impressed with the character of the fishermen. The proposed alterations are being carried out on the lines of their suggestions. It is proposed to close the existing entrance to the basin, which is a natural opening between two reefs standing out a short distance from the shore. The existing entrance, too, has the disadvantage of being dry at low-water. The new entrance will be formed a couple of hundred feet to the east of the present entrance, and the reefs already mentioned will be used in the formation of a breakwater, which will protect the narrow channel leading into the basin. The new entrance will have 3 feet of water at low tide. The most important part of the scheme, however, is the construction of a new breakwater of concrete, which will jut out from the land in a southerly direction immediately to the east of the new entrance. It will have the double advantage of protecting the entrance from the heavy seas which come from the open, and of forming a quay to which steamers can be brought. It will run out upwards of 250 feet from land. It will be 35 feet wide at the base and have a 20-feet roadway at the top. A parapet 10 feet thick and 8 feet high will run along the outer edge. Outside, 30-ton concrete blocks will be piled along its length to protect it from the action of the waves, and inside it will be finished with a quay face. At its outer end there will be at low tide a depth of 15 feet of water. The improvements will include, of course, the cleaning out of the harbour basin and the making of a roadway from the village, which is just above the basin, to the new pier and breakwater. Under the West Highland scheme 15,000*l.* has been voted for the new works, and a further expenditure of 1,200*l.* was in contemplation for minor alterations, which were to have been carried out independently of the commissioners' scheme.

REGISTRATION OF PLUMBERS.

AT the meeting of the District Council for Hull, East Riding of Yorkshire and North Lincolnshire, held in Hull, Councillor Cohen in the chair, there were present Alderman Fraser, Dr. Mason, D.P.H. (medical officer of health), Mr. A. E. White (borough engineer), Mr. J. Bilson, F.R.I.B.A., and master and operative plumbers. A report of the delegates (Alderman Fraser, Councillor Cohen and Dr. Mason) who attended the plumbers' meeting of the International Congress of Hygiene and Demography, was read, which stated that a resolution had been passed recording the opinion of the Congress that an organised and efficient system of registration of qualified plumbers was essential to the protection and preservation of the health of the community, and that the time had arrived when application should be made to Parliament for powers enabling a Council to take measures for systematically promoting technical education amongst plumbers in all parts of the United Kingdom, and regulating the practice of registered plumbers. At a special meeting of the Congress the master of the Worshipful Company of Plumbers (Mr. W. H. Bishop) also read a paper upon the education and registration of plumbers in relation to the public health; and a paper was read by Dr. Reid upon the education, position and duties of persons engaged in sanitary administration, when, after discussion, the Congress resolved that they cordially approved of the principles of statutory examinations and registration of architects and plumbers.

Alderman Fraser stated that the first meeting referred to was one of the largest held. The meeting was thoroughly representative and most interesting.

On the motion of Mr. G. F. Wells, R.P., seconded by Mr. W. Hodgson, R.P., a vote of thanks was accorded to the delegates, and their report ordered to be entered on the minutes.

A Bill proposed to be introduced into Parliament respecting the national registration &c. of plumbers was then considered, and after a few suggested amendments approved.

Mr. R. H. Kenningham, R.P., was appointed teacher of the plumbers' technical instruction class at the Young People's Institute.

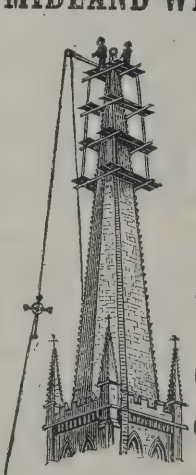
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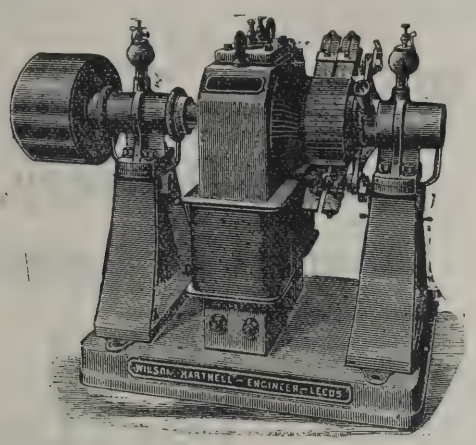
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ELECTRIC APPLIANCES.

AMONGST the many types of dynamo machines now in the market, there is one which is well worth noticing which has not yet been made sufficiently well known. It is that made by Mr. Wilson Hartnell, of Leeds and 11 Queen Victoria Street, London. We had the opportunity of inspecting one of these during the week, and were struck at once by the design and well-proportioned working parts. Generally we have noticed the spindles of this class of machinery to be quite the opposite to all engineering practice, and may be considered in most cases analogous to a walking-stick. Mr. Hartnell has struck out in the right direction, and made his dynamos suitable for continuous running. In the case of a dynamo of 5 horse-power



the bearings are 4 and 6 inches long respectively. The spindle is of steel, about $1\frac{7}{16}$ inches diameter. The armature is $8\frac{1}{2}$ inches diameter, and is fitted with an exceptionally large commutator, 7 inches diameter, which enables the machine to run without any sparking and consequent minimum wear. The adjustment of the brushes, which are arranged on the trigger principle, is a novel and convenient method, and is considered another important feature of this machine. They are, we understand, having a good sale for private houses, mansions, factories, &c., and the sale for export is gradually on the increase. Mr. Hartnell has, we find, done a large amount of work, including Wentworth Castle, near Barnsley; the new Town Hall, Dewsbury, &c., and shows an unbroken record of success. We also see that his tender for the lighting of the Town Hall at Bradford has been accepted in keen competition.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

13822. John Hughes, for "An improved paint burner."

13824. Henry Champness, for "Improvements in the construction, also in the mode of fastening or securing when shut, of sliding or other doors."

13852. William Charles Brett, for "Improvements in sashes for window and other purposes."

13914. Thomas Whitaker, for "Improvements in the flooring or roadways of bridges and other structures."

13940. John Neuil Maskelyne, for "Improvements in registering locks for doors."

13983. William Pellam Winter, for "Improvements in and relating to securing moulds in the manufacturing of artificial stone, paving and other uses."

14050. Archibald Langdon Parker, William Harold Brenton and Ludovic Johnston, for "A combination bolt and indicator for doors."

14064. Lawrence Wilson, for "Improvements in and connected with blocks and tiles for paving and flooring, for facing walls and ceilings and for similar purposes."

14096. James Graham Thompson, for "Combination electric lock."

14131. Richard Edwin Hargreaves, for "Improved means or apparatus for applying and securing carpets or other coverings to stairs and steps."

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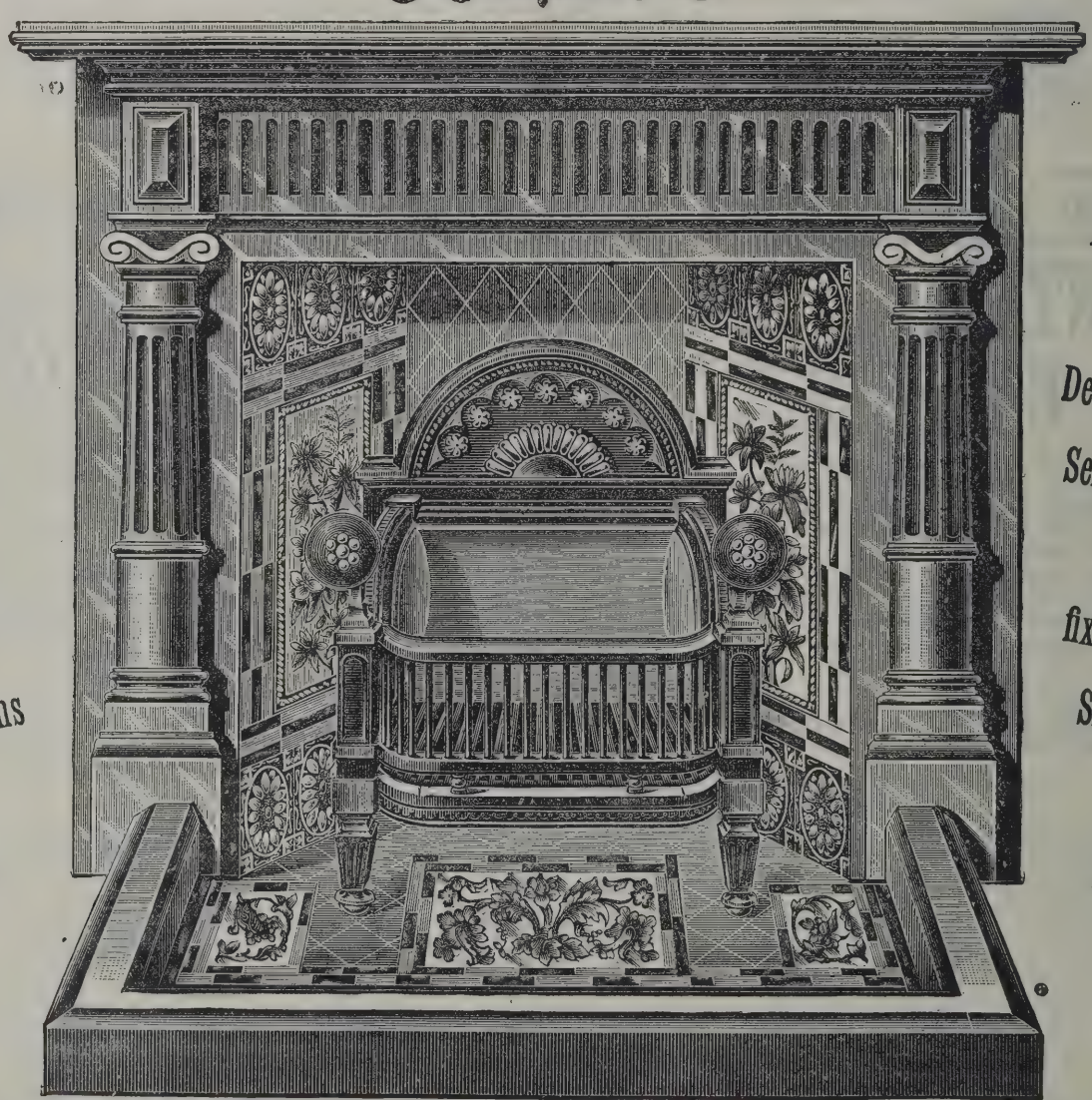
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Friday, September 4, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, SEPTEMBER 11, 1891.

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TENDERS, ETC.

*** *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office*, 175 *Strand, London, W.C., not later than* 5 P.M. *on Thursdays.*

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

ABERAVON.—Designs are invited for the Proposed Port Talbot Technical and Intermediate School. Mr. M. Pennant, Town Clerk's Office, Aberavon.

BATH.—Oct. 31.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

EASTLEIGH.—Sept. 28.—Plans are required for Sewerage and Sewage Disposal. Mr. Joseph Robins, Clerk to the South Stoneham Rural Sanitary Authority, 19 and 20 Portland Street, Southampton.

SHREWSBURY.—Sept. 30.—Designs, &c., are invited for Building Police Station, Constable's House, &c. Mr. W. C. Eddowes, Borough Surveyor, The Square, Shrewsbury.

SOUTH STONEHAM.—Sept. 28.—Designs, &c., are invited for Sewerage and Disposal of Sewage. Mr. Joseph Robins, 19 and 20 Portland Street, Southampton.

VICTORIA, BRITISH COLUMBIA.—Designs are invited for Christ Church New Cathedral. Mr. Owen T. Bulkeley, Church House, Dean's Yard, Westminster, S.W.

CONTRACTS OPEN.

ALDERSHOT.—Sept. 19.—For Reconstructing Sewer Outfall. Major S. Waller, Commanding Royal Engineer, South Camp, Aldershot.

ASHTON-UNDER-LYNE.—Sept. 19.—For Constructing Gasholder. Mr. David Clarke, Gas Offices, Ashton-under-Lyne.

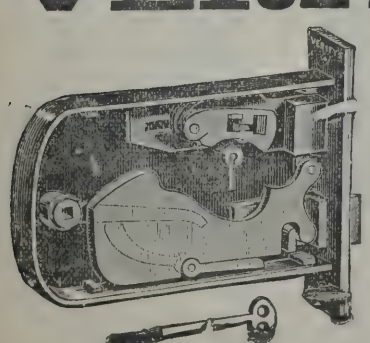
BARGOED.—Sept. 14.—For Classroom to Board School, Mr. John Williams, Architect, 4 Edward Street, Morgan Town. Merthyr Tydfil.

BATLEY.—Sept. 18.—For Rebuilding Alexandra Mill. Mr. Walter Hanstock, Architect, Branch Road, Batley.

BLACKWALL.—Oct. 12.—For Constructing (by Compressed Air) and Maintaining Carriageway and Footway Tunnel under the River Thames. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

BLACKWOOD.—Sept. 14.—For Additions, &c., to Board Schools. Mr. W. L. Griffiths, Architect, High Street, Newport, Mon.

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BRISTOL.—Sept. 17.—For Rebuilding Brick Sewer. Mr. T. H. Yabbicom, Engineer, 51 Prince Street, Bristol.

BRISTOL.—Sept. 23.—For Building Two Pairs of Semi-detached Villas. Mr. A. Barratt, Surveyor, Somerset Chambers, Corn Street, Bristol.

BURNLEY.—Sept. 15.—For Building Residence. Messrs. Wm. Waddington & Son, Architects, 5 Grimshaw Street, Burnley.

CARDIFF.—Sept. 16.—For Alterations and Additions to Free Library. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CARLISLE.—Oct. 1.—For Building Public Library, Museum, School of Art, &c. Mr. W. Howard Smith, City Surveyor, 36 Fisher Street, Carlisle.

CHARLTON.—Sept. 22.—For Supplying and Fixing Wrought-iron Fencing. Architect of the London County Council, Spring Gardens, S.W.

COCKERMOUTH.—Sept. 16.—For Building Stable, Cart Shed, &c., and Fire-engine House. Mr. R. S. Marsh, Surveyor, Cockermouth.

DARTFORD.—Sept. 12.—For Supplying and Setting Boiler, Engine, &c. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

DEWSBURY.—Sept. 16.—For Entrances, Turnstile Boxes, Outbuildings, &c., at Football Field. Mr. Sam. Shaw, C.E., 2 Union Street, Dewsbury.

DUKINFIELD.—For Building Wheatsheaf Inn and Four Cottages. Messrs. John Eaton & Sons, Architects, Ashton-under-Lyne.

DUNSFORD.—Sept. 28.—For Building House, Poole Farm. Mr. E. Ellis, C.E., Bedford Circus, Exeter.

EAST HAM.—Sept. 15.—For Supply of Broken Granite. Mr. Savage, Surveyor, Local Board Offices, East Ham.

EASTLEIGH.—Sept. 16.—For Building Boys' School, Cranbury Road. Messrs. W. H. Mitchell, Son & Gutteridge, Architects, 9 Portland Street, Southampton.

FELIXSTOWE.—Sept. 15.—For Building Local Board Offices. Mr. George S. Horton, Surveyor to the Local Board, Felixstowe.

FLOCKTON.—Sept. 14.—For Laying Water Pipes, Constructing Meter House, Pumping Station, &c. Mr. W. J. Wood, Engineer, Flockton.

GALWAY.—Sept. 19.—For Ironwork of Swivel Bridge. Mr. J. Perry, Surveyor, County Surveyor's Office, Galway.

GREAT OUSEBURN.—Sept. 12.—For Building Detached Infirmary, for Sixteen Beds. Mr. C. Hornsey, Architect, 16 Railway Street, York.

HAILSHAM.—Sept. 14.—For Building Chapel. Mr. O. Mitchell, Architect, 8 Alexandra Terrace, Hailsham.

HAMPSTEAD HEATH.—Sept. 29.—For Erecting Public Conveniences. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

HANLEY.—Sept. 12.—For Building Two-storey Warehouse, &c., and Extension of Offices at Phœnix Works. Messrs. Wm. Sugden & Son, Architects, Leek.

HANWELL.—Sept. 21.—For Supply of Broken Granite. Mr. W. S. James, Local Board Offices, High Street, Hanwell, W.

HAVANT.—Sept. 12.*—For Building Post Office. Mr. A. Edwin Stallard, Architect, West Street, Havant.

HERNE HILL.—Sept. 29.—For Additions, Alterations and Repairs at Brockwell Park. Architect of the London County Council, Spring Gardens, S.W.

HERNE HILL.—Oct. 5.—For Supplying and Erecting Cleft Oak Fencing at Brockwell Park, Architect of the London County Council, Spring Gardens, S.W.

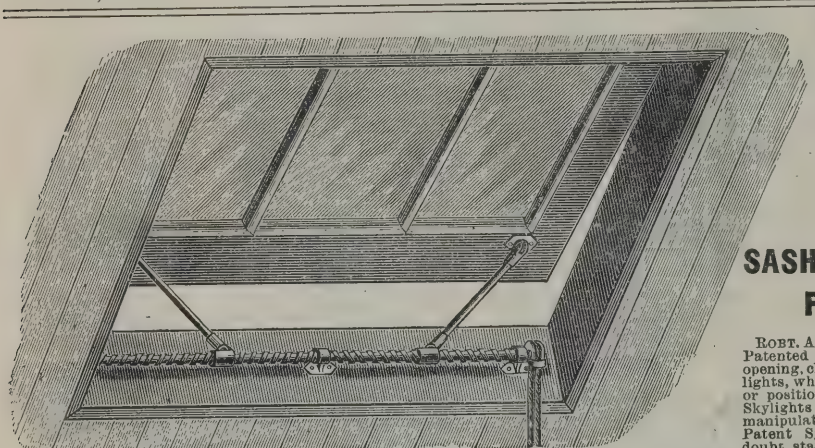
HOLBECK.—For the Several Works required in the Erection of Wesleyan Schools, The Mint. Mr. T. Butler Wilson, Architect, 12 East Parade, Leeds.

HORNSEY.—Sept. 12.—For Building Public Baths and Washhouses. Mr. A. Hessell Tiltman, Architect, 70 Torrington Square, W.C.

HORNSEY.—Sept. 16.—For Making Good Roads. Mr. T. De Courcey Meade, Engineer, Local Board Offices, Southwood Lane, Highgate, N.

HUDDERSFIELD.—Sept. 23.—For Building Three Dwelling-houses, Stabling for Twenty Horses, Cart-sheds, Boundary Walls, &c. Messrs. John Kirk & Sons, Architects, Huddersfield.

* Names and addresses to be forwarded not later than date.

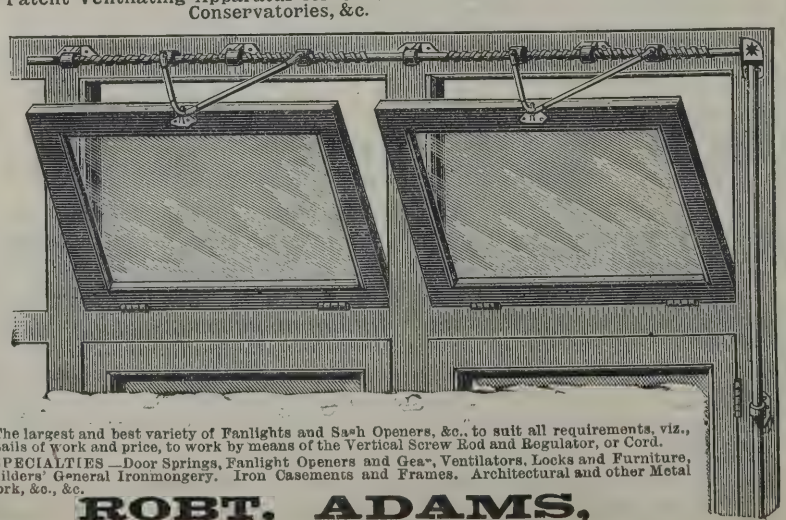


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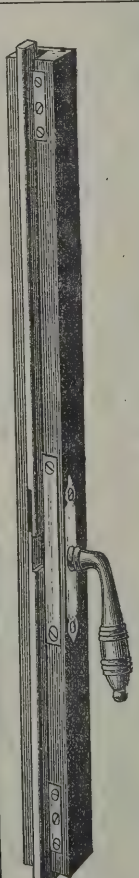
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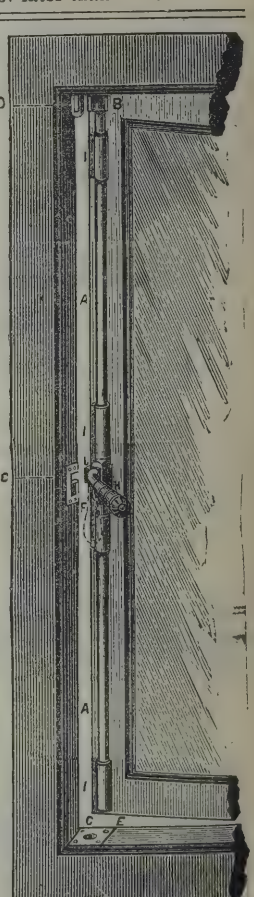




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ILKESTON.—Sept. 16.—For Building Pair of Semi-detached Villas. Mr. George Haslam, Architect, Euclid House, Ilkeston.

ISLINGTON.—Sept. 12.—For Building Public Baths and Washhouses. Mr. A. H. Tiltman, Architect, 70 Torrington Square, W.C.

KENDAL.—Sept. 11.—For Building Dwelling-house, &c. Mr. Stephen Shaw, Architect, 45 Highgate, Kendal.

KETTERING.—Sept. 15.—For Supply of Wrought-iron Fencing. Mr. T. R. Smith, Local Board Offices, Kettering.

LEWISHAM.—Sept. 15.—For Kerbing and Tar Paving Footways and Channelling and Metalling Roadway. Surveyor, Board of Works Offices, Catford, S.E.

LONDON.—Sept. 24.—For Additions, &c., to Patent Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

LONDON.—Oct. 5.—For Supply of Gravel, &c., to Victoria Park and Battersea Park. Architect of the London County Council, Spring Gardens, S.W.

LYNN.—Sept. 16.—For Building Cottage, &c. Mr. Herbert Tilson, 17 Railway Road, Lynn.

MANCHESTER.—Sept. 15.—For Supplying and Fixing Iron-work in Construction of Gymnasia, Birchfields. The City Surveyor, Town Hall, Manchester.

MANSFIELD.—Sept. 14.—For Building Detached House. Mr. R. Frank Vallance, Architect, Mansfield.

MARYPORT.—Sept. 15.—For Building Nine Shops and Dwelling-houses. Mr. C. Eaglesfield, Architect, Maryport.

NORTH WOOLWICH.—Sept. 29.—For Rebuilding River Wall, and Supplying and Fixing Wrought-iron Fencing. Architect of the London County Council, Spring Gardens, S.W.

OXFORD.—Sept. 12.—For Building Stables, Shedding, &c. Mr. W. H. White, City Engineer, Oxford.

SHENLEY.—Sept. 16.—For Building Board School. Mr. R. H. Hill, Architect, 3 Lombard Court, Lombard Street, E.C.

SLIGO.—Sept. 16.—For Additions to Constabulary Barrack. Mr. W. B. Soady, Office of Public Works, Dublin.

SOWERBY BRIDGE.—Sept. 11.—For Building Eight Houses, Carr Head. Mr. S. Wilkinson, Architect, Sowerby Bridge.

SOWERBY BRIDGE.—Sept. 14.—For Building Manufactory, Warehouse, &c. Mr. T. Lister Patchett, Architect, George Street Chambers, Halifax.

SWINDON.—Sept. 21.—For 10-ton Steam Road Roller. Mr. H. Kinneir, Local Board Offices, Faringdon Street, New Swindon.

TOTTENHAM.—Sept. 15.—For Making Roads. Mr. J. E. Worth, Coombes Croft House, High Road, Tottenham.

TOTTENHAM.—Sept. 15.—For Constructing Concrete Invert and Side Walls for Stonebridge Brook. Mr. J. E. Worth, Engineer, Coombes Croft House, High Road, Tottenham.

TOWCESTER.—Sept. 16.—For Additions, &c., to Wesleyan Chapel. Messrs. H. H. Dyer & Son, Architects, Newland Chambers, Northampton.

TWICKENHAM.—Sept. 23.—For Supply of Broken Granite and Flints. Mr. G. B. Laffan, Local Board Offices, Queen's Road, Twickenham.

WARRINGTON.—Sept. 18.—For Building Chapel. Mr. R. Parry, 10 Grandidge Street, Rochdale.

WEST DERBY.—For Building Police Station. Mr. George Holme, 8 Westminster Chambers, Liverpool.

WEST HAM.—Sept. 22.—For Building Public Hall and Offices for the Town Council. Mr. Lewis Angell, F.R.I.B.A., Town Hall, Stratford, E.

WEYMOUTH.—Sept. 15.—For Building Soldiers' Quarters. Colonel C. J. Russell, Royal Engineer Office, Weymouth.

WHITBY.—Sept. 12.—For Building Three Houses. Mr. R. Lennard, Architect, Cliff Street, Whitby.

WOMBWELL.—Sept. 14.—For Building Police-station. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

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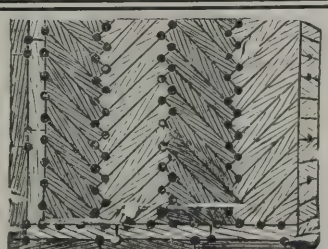
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Dove Bros., Blackpool	£740 0 0

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Accepted Tenders.

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A. Poole, Ilminster	845 0 0
Stickland & Fowler, Combe St. Nicholas	740 0 0
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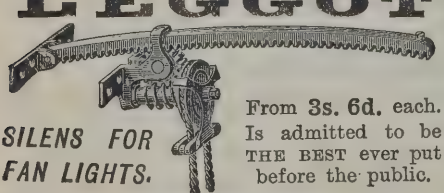
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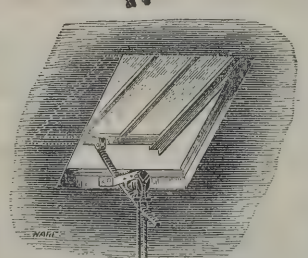


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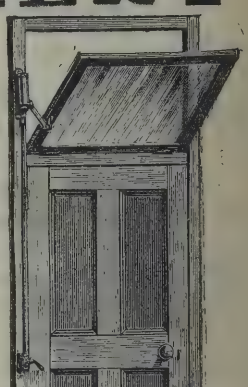


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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.
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COMPTON GIFFORD.

For Construction of Sewer, Mannamead, Compton Gifford. Mr. J. C. INGLIS, Surveyor, 1 Buckland Street, Plymouth.

W. T. Jinkin, Plymouth	£155 0 0
T. SHADDOCK, Mutley (*accepted*)	149 0 0

EYEMOUTH.

For Extension of Eyemouth Harbour.

George Lawson, Glasgow, cost about	£10,000 0 0

FOREST GATE.

For Building Postal Sorting Office, Forest Gate, for the Commissioners of H.M. Works and Public Buildings.

T. Garrett & Son	£2,040 0 0
W. Neil	1,972 0 0
R. Edwards	1,921 0 0
Jackson Bros.	1,848 0 0
T. Channing	1,680 0 0
A. Martin	1,620 0 0
A. Bunting	1,615 0 0
J. & M. PATRICK (*accepted*)	1,495 0 0

HORWICH.

For Construction of Sewers, with Manholes, Lampholes and Flushing Chambers, for the Horwich Local Board. Mr. J. E. JACKSON, Surveyor, Public Hall, Horwich.

Low Level.

S. & E. Bentley, Leicester	£3,256 4 6
W. Winnard, Wigan	2,898 9 10
J. & T. Binns, Horwich	2,875 18 2
H. Wood & Co., Bolton	2,618 12 11
W. Pollitt, Bolton	2,486 1 7
Æ. YATES, Horwich (*accepted*)	2,405 12 11
Surveyor's estimate	2,585 18 2

Crown Lane Sewer, &c.

S. & E. Bentley	871 4 6
W. Winnard	718 7 0
H. Wood & Co.	708 13 7
J. & T. Binns	699 6 10
E. Yates	589 4 2
W. POLLITT (*accepted*)	507 14 4
Surveyor's estimate	621 12 6

LINCOLN.

For Alterations to Church House and Institute, Lincoln. Mr. WATKINS, Architect, Lincoln.

Wright & Sons	£1,390 0 0
H. S. & W. Close	1,294 10 0
M. OTTER & Co. (*accepted*)	1,267 0 0

LLANTHONY ABBEY.

For Building Stone Arched Bridge over the River Houddu, Tyvolog Ford, near Llanthony Abbey. Mr. JOHN GILL, Surveyor.

T. S. Foster, Abergavenny	£208 0 0
Elijah Lewis, Abergavenny	183 0 0

LONDON.

For Extension of Nurses' Quarters and Escape Bridges, at Infirmary, Brook Street, S.E.; Officers' Lavatories and Extension of Workshops at the Workhouse, Princes Road, for the Lambeth Guardians. Mr. T. W. ALDWINCKLE, Architect, 2 East India Avenue, Leadenhall Street. Quantities supplied.

G. Gibson	£4,687 0 0
B. E. Nightingale	4,586 0 0
W. Smith	3,997 0 0
G. E. Todd	3,997 0 0
J. Holland	3,959 0 0
W. Johnson & Co., Limited	3,917 0 0
A. M. DEACON & Co. (*accepted*)	3,829 0 0

For Alterations and Additions to Workshops at Workhouse, Marloes Road, W., for the Guardians of St. Mary Abbott's, Kensington. Mr. T. W. ALDWINCKLE, Architect, 2 East India Avenue, Leadenhall Street.

Williams & Richards	£978 0 0
Flew & Co.	949 0 0
W. JOHNSON & Co., LIMITED (*accepted*)	875 0 0

For Constructing Road and Sewer, Acton. Messrs. MADDOX & SON, Surveyors, 9 Warwick Court, Gray's Inn.

Bowles, Bayswater	£979 0 0
Nowell & Robson, Kensington	669 0 0
Serff Bros. & Co., Chiswick	665 0 0
D. Cronin, Acton	623 13 6
A. T. Catley, Lloyd Square	620 0 0
Warner & Co., Stoke Newington	588 0 0
E. Parry, Fulham	580 0 0
TOMES & WIMPEY, Hammersmith (*accepted*)	580 0 0

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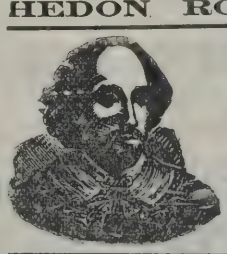


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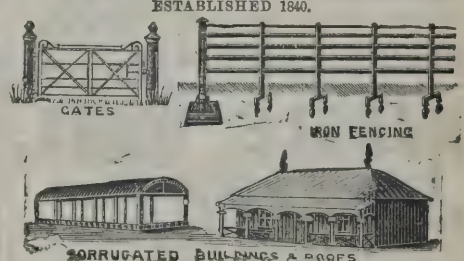
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For Alterations to the Coach and Horses, 4 Dover Street, Piccadilly, for Mr. G. Marshall. Mr. W. SECKHAM WITHERINGTON, F.R.I.B.A., Architect, 79 Mark Lane.

Drew & Cadman	£1,597 0 0
D. Laing & Son	1,595 0 0
W. G. Larke & Son	1,530 0 0
C. F. Kearley	1,498 0 0

For Pulling-down and Rebuilding Premises, Chelsea, for Mr. W. Cosby Broom. Mr. WILLIAM HUNT, Architect, 5 York Buildings, Adelphi.

William Downs	£1,080 0 0
Turtle & Appleton	1,048 0 0
Charles Wall	1,045 0 0
B. E. Nightingale	948 0 0
Sydney Knight	890 0 0
Eyears	847 0 0
H. Somerford & Sons	799 0 0
E. P. BULLED & Co. (*accepted*)	779 0 0

Machinery.

SUMMERSCALES & SON (*accepted*)	583 12 0

For Completion of Warehouse Premises, Nos. 35 and 37 Hoxton Street. Mr. FREDK. G. GRIERSON, Architect, 9 Old Jewry Chambers, Cheapside.

Fredk. Voller	£520 0 0
H. & E. Lea	495 0 0
Courtney & Fairbairn	473 0 0
J. Pocock	433 0 0
C. WATTS (*accepted*)	398 0 0

NEWCASTLE-ON-TYNE.

For Alterations and Additions to St. Andrew's Tannery, Newcastle-on-Tyne, for Mr. J. G. Fenwick, J.P. Messrs. PLUMMER & BURRELL, Architects, Newcastle-on-Tyne.

S. B. BURTON, Newcastle (*accepted*)	£348 5 0

PONTYPRIDD.

For Alterations to House, Pontypridd, Additions and other Preparations for Sunday School Purposes. Mr. J. DAVIES, Architect, 28 Wood Road, Pontypridd.

James & Ovans, Pontypridd	£251 0 0

Only one tender received.

ROCHDALE.

For Pair of Semi-detached Houses, Manchester Road, for Messrs. Coulthard & Jackson. Mr. JESSE HORSFALL, Architect, Todmorden.

Accepted Tenders.

T. Taylor, Rochdale, mason and brickwork.
Eastwood & Greenwood, Rochdale, carpenter and joiner.
R. Woolfenden, Rochdale, slater.
J. Kershaw, Heywood, plumbing, &c.
J. Blacka, Todmorden, plastering.

For Detached House, Manchester Road, for Mr. W. T. Heap. Mr. JESSE HORSFALL, Architect, Todmorden.

Accepted Tenders.

T. Taylor, Rochdale, mason and bricklayer.
T. Crablin, Rochdale, carpenter and joiner.
R. Woolfenden, Rochdale, slater.
J. Tongue, Rochdale, plumbing, &c.
J. Blacka, Todmorden, plastering.

RUSHDEN.

For Additional Bedrooms, External and Internal Painting and Decorating for the Rushden Hotel, Coffee Tavern and Public Hall Co., Limited. Mr. H. H. DYER, Architect, Northampton.

H. Knight, Rushden	£172 6 4

SEVENOAKS.

For Works in Vine Court Road, for the Sevenoaks Local Board. Mr. JABEZ MANN, Surveyor.

J. Jackson, Forest Gate	£893 1 0
E. Iles, Wimbledon	737 9 3
S. Hudson, West Dulwich	608 6 4
D. Marcher, Bromley	532 15 10
Surveyor's estimate	652 0 0

STOCKPORT.

For Cleaning and Painting the Iron Bridges. Mr. J. ATKINSON, A.M.I.C.E., Borough Surveyor, Stockport.

W. Booth, Stockport	£238 0 0
ASHTON & TOWNSEND, Stockport (*accepted*)	170 0 0
J. Wrigley, Stockport	131 7 0

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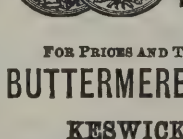
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MANSFIELD.

STOCKPORT—*continued.*

For Construction of Brick Retaining Wall, on the West Bank of River Mersey, Stockport. Mr. A. M. FOWLER, Engineer, Borough Chambers, Stockport.

P. Smith, Rusholme	£4,541	3	11
A. Kellett, Manchester	3,706	0	0
Holme & King, Liverpool	3,170	16	0
H. W. Meadows, Heaton Norris	2,421	0	0
D. EADIE, Stockport (*accepted*)	1,960	0	0

SUNDERLAND.

For Alterations to Insane Wards at the Workhouse, Sunderland. Messrs. J. & T. TILLMAN, F.R.I.B.A., Architects, Sunderland.

J. W. White, Sunderland	£133	0	0
J. C. Young, Sunderland	130	0	0
J. G. KIRTLEY, Sunderland (*accepted*)	116	0	0
Painter's tender (extra on above)	14	0	0

WALSALL.

For Building Technical Workshops, &c., for the Committee of the Walsall Technical School.

Hunter, Willenhall	£650	0	0
B. Round, Oldbury	534	0	0
J. Lynex, Walsall	510	0	0
J. Guest & Son, Wolverhampton	500	0	0
T. Taylor, Walsall	497	0	0
W. Kendrick, Walsall	489	0	0
E. Cox, Walsall	480	0	0
Bostridge Bros., Birmingham	479	0	0
W. WISTANCE, Walsall (*accepted*)	478	0	0

WATFORD.

For Supply of Valves, Pipes, &c., for the Watford Local Board.

Oakes & Co.	£525	6	2
The Staveley Co.	437	6	2
Cochrane & Co.	433	17	6
Clay Cross Co.	429	10	8
Rammidge & Co.	419	10	0
Firmston Bros.	407	7	4
H. G. ROGERS, Watford (*accepted*)	406	12	9
Stanton Iron Co.	406	3	1

WARWICK.

For Building Infectious Hospital in connection with the Warwick County Lunatic Asylum.

Rowbotham	£4,750	0	0
Bowen	4,527	0	0
Smith & Son	4,480	0	0
Malin	4,470	0	0
Barnsley & Son	4,388	0	0
J. H. & T. CASHMORE, Warwick (*accepted*)	4,200	0	0

TRADE NOTES.

THE electric light has been introduced into the Baltic Works, Arbroath, one of the largest of the spinning mills and power-loom factories in the town. This is the first introduction of the electric light into Arbroath.

IN connection with the heating and ventilation of the new Parkhouse School, Arbroath, a gas-engine is to be used, and the hot-water pipes will be placed so that the fresh air must pass through the coils and thus get heated before it passes into the ducts to the classrooms. Before passing through the coils the fresh air has to pass through a screen of Manilla grass, over which a small dribble of water will flow. The air is thus washed as it passes through the screen, the soot, dust and other impurities are kept back, so that only pure air will pass into the school. By the introduction of an air-propeller, the air in the classrooms will be changed five times an hour.

AN offer has been made by Mr. Corbett, M.P., to erect at Towyn massive and ornamental fencing posts and chains between the esplanade and carriage drive. The designs are specially prepared by the Coalbrookdale Co., who are to execute the work for about 400*l.*

THE Portsmouth Town Council have decided to adopt the electric light, and agreed to borrow 60,000*l.* to cover the cost of the site and machinery.

THE *Levant Herald* says that among the applications for concessions for public works now being considered by the Minister of Public Works is one for the lighting of the town of Damascus by electricity. An application for the building of an electric tramway in the port of Smyrna is also at present under the consideration of the Turkish Minister of Public Works.

THE new schools, Loanhead, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

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"CLIMAX"
PATENT DIRECT-ACTING TURRET
VENTILATORS
Are the Best in Design, most Powerful, and Cheapest in the Market.
CLIMAX VENTILATING CO., 15 GREAT GEORGE STREET, WESTMINSTER, S.W.

AT the new school about to be opened at Partick by the Govan School Board, the heating and ventilation of the school have received special attention. The rooms are heated by hot-water pipes, and the bath simultaneously with the filling, both being effected on a most economical consumption of fuel. The boiler has been fitted with the Vulcan smoke-consuming apparatus, which by admitting air behind the furnace-bars causes the ignition of the smoke in the flues. Fresh air is admitted to each room through coils of hot pipes, and the vitiated air extracted through separate channels by two Blackman fans, 48 inches in diameter, propelled by a 4 horse-power Otto gas-engine.

TENDERS for the construction of twenty miles of railway from Sofia to Pernik will be received up to September 24. The specifications can be inspected at the Ministry of Public Works at Sofia.

THE subject of jetty accommodation was again considered at the meeting of the Dundee Harbour Board. The engineer recommended the removal of the rocks opposite the west end of the present low-water jetty to a depth of 14 feet below low water of ordinary spring tides, and that the present jetty be extended by 250 feet, at an estimated cost respectively of from 1,500*l.* to 2,000*l.*, and from 6,000*l.* to 8,000*l.* The trustees resolved to invite tenders for the removal of the rocks, but deferred consideration of the proposal to extend the jetty.

THE tender of Mr. Walter Lawrence for works at the Epping Police Station has been accepted, as amended, at 787*l.*, being an increase of 120*l.*

AT the meeting of the joint committees of the Shetland County Council and the Lerwick Town Council, designs of the proposed historical window about to be presented to Kirkwall from Lerwick were exhibited. The window will represent in armour Earl Henry St. Clair, the builder of the castle of Kirkwall.

THE church of Bulmer has been reopened after repairs carried out under the direction of Mr. Fred Chancellor, of Chelmsford, at a cost of about 700*l.* The repairs consist of a new roof, new windows, new floor to the north aisle and new heating apparatus (Grundy's).

THE contract for restoring the chancel of the parish church, Chapel-en-le-Frith, has been given to Mr. Alfred Hill, builder, of Litton and Tideswell.

THE Edinburgh Town Council have decided to erect a refuse-destructor at Powderhall.

AMERICAN NOTES.

A PALATIAL car has just been built in Massachusetts for the Montreal and Toronto line of the Canadian Pacific. It is 66 feet long; the central "drawing-room," which is turned into a dormitory at night, is 32 feet in length, 9 feet in width, and 10½ feet in height, and is furnished with a dozen easy chairs. The ceiling is frescoed with a beautiful design representing the four seasons, and one of the most striking novelties consists of six bay windows. Besides this apartment there are lavatories—where a quantity of powdered soap slides into the basin of water on pressing a button—a kitchen, a safe for valuables, an "observation room," a private state room, a library with writing desk and medicine chest, and other conveniences. The car is ventilated by compressed air and heated by steam from the engine.

RECENTLY the large Rush Street drawbridge over the Chicago river was turned for the first time by electricity. This, says the *Chicago Journal of Commerce*, is undoubtedly the largest swinging-bridge in the world fitted up for operation by electric power.

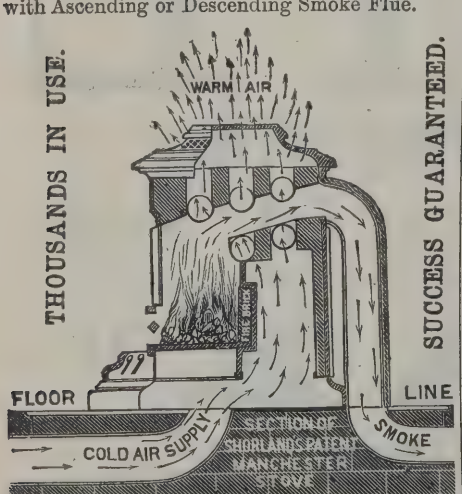
GOVERNOR J. V. AYCARDI, of Panama, has tendered for exhibition at the World's Fair a beautiful piece of carved marble, a bas-relief representing the landing of Columbus, which was presented to the State of Panama nearly ninety years ago by the Empress Josephine, who at the same time gave the colossal bronze statue of Columbus, which now stands in Aspinwall.

PLANS have been prepared for an Oddfellows' Temple at Chicago which is to equal Washington's monument in height. The building is to be thirty-four storeys high. The estimated cost is 3,500,000 dols.

A BOSTON paper says:—A young lady architect of Birmingham, Alabama, Miss Sallie Smith, was one of the most creditable competitors for the prize-design of the Women's Building for the World's Fair.

THE Art Department has issued a strong circular urging every architect in the United States to personally assist in an exhibit of American architecture. The manifesto says:—"The membership of the American Institute of Architects includes all the well-known names, in different parts of the country, of men to whom the growth of American architecture, as distinguished from mere building and construction, is due, and of which they are to-day the honoured representatives. It is

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With Adjustable and Rubbing Contacts.
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The most accurate and reliable made, whereby all risk of Fire is eliminated.
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General Post Office
Stock Exchange
City Bank
London County Council
L. & N. W. and other Railways
Theatre Royal, Drury Lane
Garrick Theatre
St. James's Hall
The Moore & Burgess Minstrels
The Tivoli Theatre
Junior United and other Clubs
The Langham Hotel
Hotel Windsor, and others
The Café Monico
Baron de Rothschild's
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through these men that the growth of fine architecture and of the professional and social status of its practitioners in this country during the last thirty years has been developed; and the influence of the work of the Institute on public-spirited laymen of artistic cultivation has been marked."

THE Philadelphia *Builder, Decorator and Woodworker* says:—Buffalo is to have a new seven-storey building for the Builders' Exchange that is to represent four leading styles of architecture. The first storey of stone will be Tuscan, the second and third Doric, fourth and fifth Ionic, and the sixth and seventh Corinthian.

THE *Boston Herald* says:—The Gas Company proposes to make a trial of fuel or water-gas, and has a plant ready for its manufacture and for its distribution over a limited territory.

BUILDING AND BUILDERS.

THE work of erecting the new Surrey County Council buildings at Kingston has been commenced. The cost is estimated at between 40,000*l.* and 50,000*l.*

IT has been decided to close up the old Court-House Police Station in Glasgow, and plans have been passed for the erection of a new police-station in East Clyde Street. The new building will be constructed at a cost of from 8,000*l.* to 10,000*l.*, and is to be three storeys in height.

THE foundation-stone of the memorial church in the township of Brithdir, in the parish of Llanrhaiadryn-Mochnant has been laid by the Dowager Lady Williams-Wynn. The church has been designed by Mr. W. H. Spaull, of Oswestry, diocesan architect.

AT the meeting of the Wednesfield School Board, Mr. Birch gave notice of his intention to move at the next meeting a resolution pointing out the desirability of erecting a new Board school.

AT the Edinburgh Dean of Guild Court the Northern Tramways Company applied for leave to construct a coal shoot at their depôt in Henderson Row. The application was made under a clause of the new Police Act, which provides that in the case of any internal alterations which do not affect the rights of other owners, and which in the opinion of the Court are of minor importance and extent, the Court may authorise the burgh engineer to grant a warrant without a formal petition to the Court. The Court were of opinion, on examination of the plan, that this was not a case in point, inasmuch as the proposed alterations would extend to the making of a door through the outer wall of the depôt into the public street, and accordingly they directed that application should be lodged in the ordinary way.

AT the meeting of the Stafford Town Council the Mayor said that about a year ago the Postal authorities had been memorialised to provide new premises. He understood that plans were prepared for a new building which was in every way worthy of the town. Since then he understood that a hitch had occurred, the point in dispute being a sum of about 200*l.* In consequence of this an alternative scheme was proposed, which simply provided for more counter-room in the present building. This was not what they wanted. They required a new building, which should be more in keeping with the other buildings in the Market Square. He thought if there was only a sum of 200*l.* stood in the way of a new building, it would pay the Council to meet the authorities in committee. A committee was appointed to meet the Post Office surveyor when he came down.

A PROPOSAL has been made that a new medical college should be built in Aberdeen, in place of extending Marischal College, at a cost of something like 17,000*l.*

PLANS for a new police station at Romford have been approved of, and the working drawings and specifications are now being got out.

THE church of St. Cuthbert, a new Roman Catholic church at Heaton, erected from the designs of Messrs. W. H. & J. E. Marten, architects, Bradford, has lately been opened.

PLANS for a new laundry and wash-house for the workhouse at Ongar have been prepared by Mr. Frank Whitmore, of Chelmsford.

The foundation-stone of a Wesleyan chapel at Lichfield, of which Mr. Thomas Guest, of Birmingham, is the architect, has been laid.

THE Government Inspector has condemned Wishaw Public School and recommended the building of a new school. The Cambusnetham School have appointed a committee to confer with an architect as to the improvement of the present building.

THE Bath Town Council have decided to erect a building for the purposes of a technical science and art school to form part of the new block of Municipal Buildings.

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IT has been decided to purchase a site, at a cost of 750*l.*, adjoining the County Court-house, Braintree, for the erection of a police station, at an estimated cost not exceeding 4,000*l.*

VARIETIES.

THE Middlesbrough Gas Committee recommend the obtaining of powers to borrow 50,000*l.* for the proposed extension of the gasworks.

THE Darlaston School Board have appointed a committee to select a site for the erection of new schools, complaints having been made of the state of St. George's Schools as unsatisfactory

THE estimated expenditure for the repair and maintenance of the Edinburgh streets, pavements, &c., is 44,260*l.* Last year the estimate was 43,115*l.*, and the actual expenditure 41,750*l.* For the formation and maintenance of sewers and drains the estimate is 16,985*l.* Last year the estimate was 13,600*l.* and the actual expenditure 12,411*l.* 12*s.*

THE Town Council of Bridgwater have appointed Mr. Francis Parr, of Barnstaple, town surveyor.

IT is proposed to erect a police-station in Green Lane, Patricroft, near the Barton Union Vagrant Ward.

THE Fish Market, Aberdeen, is to be extended eastwards along Commercial Road for a further distance of 250 feet. The full length of the market will then be 1,000 feet.

THE damage done by the recent floods on the catchment area of the Simla Waterworks has, the *Indian Engineer* says, proved to be more serious than was at first anticipated. Nearly all the bridges are blocked by trees and débris, so that the water is now running over the top of them. Eight bridges have been entirely washed away, and the road destroyed in several places. Over 400 feet of piping has disappeared, while in places where the road is broken, lengths of from 20 to 40 feet of piping are hanging in mid air. This unexpected accident has emphasised the necessity of providing a more complete water supply for Simla.

THE Post Office authorities are looking out for a site or building suitable for a new post-office at Tipton.

THE Works Committee of the Aberdeen Harbour Board have agreed to extend the present wooden wharf at Market Street across the top of Albert Basin, at a cost of 1,530*l.* The wharf is for the accommodation of the timber trade.

THE engineers, MM. Zscokke and Seifert, appointed by the Basle Civil Court to investigate the causes of the railway accident which occurred in June last, ascribe the disaster to the defective construction of the bridge at Moenchenstein.

THE Town Council of Inverkeithing have resolved to approach the North British Railway Company with a proposal for the construction of a new harbour and dock at that port.

THE cost of laying a second pipe in connection with the Lintrathen Waterworks between Pitnappie and Dundee, and of relaying upwards of six miles of the original pipe in the Valley of Strathmore, in which numerous bursts have occurred since it was put down, is estimated at between 60,000*l.* and 62,000*l.*

A GOVERNMENT inquiry has been held at Guildford, at the Town Hall, as to the application of the Town Council to borrow 35,000*l.* for sewage-working.

A LOCAL GOVERNMENT inquiry has been held at Colne into the Local Board's application to borrow 7,987*l.* for works of private street improvement. The application was unopposed.

THE Brighton Guardians have been authorised to expend 5,500*l.* on the purchase of a site for a board-room and offices.

THE WEYMERSCH PRIMARY BATTERY.

THE installation of electric light in country houses and detached places generally has always been attended with insurmountable difficulties. We may enumerate them as follows:—First cost of plant, say, dynamo, gas or other engine for driving, items which would bring the expenditure to start with to not less than 250*l.* for an average installation. This is by no means the end of the outlay. It would be necessary to provide an engine-house (with greater risk of fire) and a man to take care of the engine; nor would the peace and quiet of the rural retreat be improved by the monotonous noise of machinery. No wonder that under these circumstances the householder in the position we have described prefers gas, and has concluded long ago that there is no way out of the difficulty. It is here that the subject of our notice, the Weymersch battery, provides a happy solution. The Weymersch battery takes the place of the engine and dynamo, and the cost of the battery is less than one-fourth of that for machine-plant to effect the same purpose, and it dispenses with the incidental troubles we have referred to. The Weymersch battery plant can be supplied complete

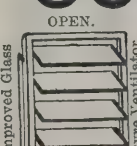
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MEDAL AWARDED, 1884.

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H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.

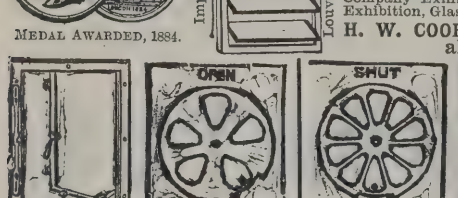
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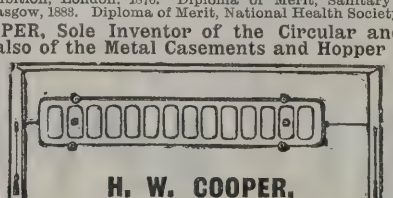
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MEDAL AWARDED, 1876.



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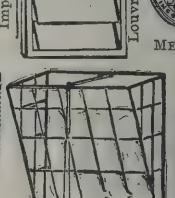


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(including primary and secondary batteries and wiring the house for about twenty-five lamps) for about 100*l.*, and the cost of working is thus summarised by Messrs. Alabaster, Gatehouse & Co., the well-known electrical experts :—"Taking a good 16-candle power incandescent lamp as requiring 50 watts to heat it to that luminosity, we find that the cost per hour (for materials) to keep such a lamp in action is in the one case 1·275*d.*, and in the second 0·9*d.* A slight reduction in the price of materials, which would probably result from buying them in larger quantities, would practically mean that a 10-candle power lamp—a convenient standard for comparison—would cost (for materials) one-halfpenny per hour." Thus 10-candle power lamps can be maintained for 5*d.* per hour ; but, assuming a higher figure, say 7*d.* per hour, to cover expenses of carriage of materials, &c., it will be seen that the cost of maintenance of ten 10-candle power lamps would be 32*l.* per annum, assuming that they are used on the average three hours per day throughout the year. The primary battery, as shown at the offices of the syndicate, is large enough to charge accumulators for a twenty to twenty-five light installation, and consists of fourteen cells. The carbons, two in each cell, are placed in two porous pots, side by side, in strong depolarising solution, and the zincs, large thin plates, are hung outside in a weak acid solution—half-pint acid to one gallon of water. The solution can be drawn off by taps and syphons for recharging. The carbon plates never wear out, and the zinc plates are easily renewable. It is at once seen that the necessaries for the maintenance of the battery are extremely simple, merely a solution which can also be supplied in the form of a chemical salt to be dissolved in water, a small quantity of commercial hydrochloric acid supplied to the consumer, and a fresh supply of zinc plates as the old ones wear out. In cases where the total number of lamps are required to be in use at one time, the lamps may be run direct from the battery ; but where, as is usually the case in domestic electric lighting, all the lamps, or only one or two, may be required at any hour of the day or night, some form of storage is necessary. This is best effected by secondary cells, the battery then being used in the place of a steam or gas-engine and dynamo. These in conjunction form the complete plant, to which may be attached a ventilating fan, driven by the power of one primary battery. This is illustrated at the offices of the company, as also at the offices of the Blackman Ventilating Company, Fore Street, E.C., with most satisfactory results. Another development is the driving of water pump (together with electric light), to be seen in operation at Messrs. Merryweather & Sons, Long Acre, W.C. Installations on the Weymersch system have been provided (in addition to the offices of the company) at Staines, Eastbourne, Horsted-Keynes, Tetbury, Sutton, Dulwich, and at Park Lane, St. James's. It will certainly inspire confidence in the Weymersch battery if we inform our readers that since 1888, when it was first introduced, the directors have been experimenting on and improving the invention, so that now the manipulation of the battery is so simple that any gardener can easily manage this, there being, moreover, nothing in the battery to get out of order, and now they submit it to the public as nearly perfect as a primary battery can be. We have no doubt that it will find a large field open to it, and without competing with dynamos under ordinary conditions, will stand alone for domestic lighting in detached places.

Architects should be especially interested in securing for their clients this inexpensive system of electric lighting, more particularly as its actual working is sure to give satisfaction. The offices of the Weymersch Syndicate, Limited, are at 2 Victoria Mansions, Victoria Street, Westminster, S.W., and a personal visit of inspection is invited to see the battery in operation.

A "TITAN" CRANE.

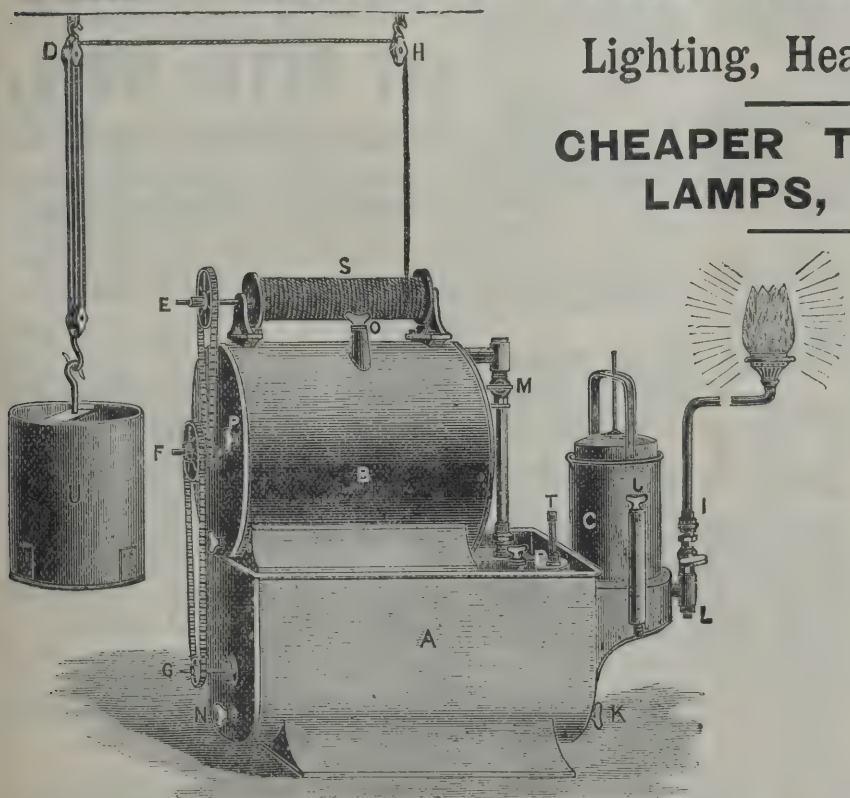
ON Wednesday several engineers visited Messrs. Stothert & Pitt's works at Bath, when some interesting experiments were made with a 50-ton block-setting "titan," which the firm has just completed for the Admiralty Harbour works, Peterhead. The machine is believed to be the largest travelling crane yet made. The working load of the "titan" is 50 tons, the proof load being 62½ tons ; the radius from the revolving centre to the extreme position of the load is 100 feet. In other words, the "titan" will pick up a test-load of 62½ tons and swing it round the circumference of a circle 200 feet—say 67 yards—in diameter, the weight lifted being equal to that of a goods locomotive and tender. The machine is capable of lifting and lowering the load, slewing or revolving round the centre through a complete circle, and racking the load in and out horizontally. The whole machine is also self-propelling. The material of which it is composed is mild steel of a very high quality. It was designed by Mr. William Matthews, under whose constant supervision it has been constructed. The gearing was designed

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by Mr. Walter Pitt, and the work was carried out and erected under the direction of Mr. P. K. Stothert, the managing director of the firm. Some details of the uses to which the "titan" is to be put may prove interesting. The Lords Commissioners of the Admiralty are constructing at Peterhead, N.B., a great harbour of refuge, of which Sir J. Coode is the engineer. The breakwater of this harbour will be formed of artificial blocks of concrete weighing upwards of 50 tons each. The machine in question is intended for placing the blocks in position; it will stand on the end of the finished portion of the breakwater, and the blocks will be brought to it in trucks; the machine will then lift them up and swing them round to the front end, when they will be run out horizontally over the water and lowered down and set by divers. The roughness of the sea at Peterhead and the great depth of water, necessitated the adoption of an exceptionally massive and strong design of breakwater, requiring for its construction blocks of great size, and hence the necessity arose of procuring a block-setting "titan" of dimensions and power considerably exceeding ordinary machines. The tests applied were in every respect satisfactory, and the huge machine will shortly be conveyed to its destination. The railway carriage from Bath to Peterhead will cost close upon 1,000*l*.

NOTES ON NOVELTIES.

THE patentee for the patent improved "interlocking" blocks for floors, wall-facings, &c., is Mr. Edward Gregory, of 6 Clarence Villas, Richmond, Surrey, late surveyor, War Department. The blocks may be made of wood or any other material suitable for the purpose required, and of any regular four-sided figure. These wood-flooring blocks comprise three styles—first, those suitable for floors of public schools, warehouses, barracks or other structures subject to hard wear. Each large block in this design interlocks with, and is in turn interlocked by, six adjacent blocks. Each small block holds down, and is in turn held down by, two adjacent blocks. Secondly, blocks similar to those above mentioned, except that they are laid diagonally. This design may be thought more suitable for corridors, aisles of churches and the like. Thirdly, blocks intended for higher-classed work, such as that in entrance-halls and vestibules to mansions, public buildings, libraries, &c., and which may be made in two or more kinds of superior woods, giving a contrast of colour.

THE CARPENTERS' STRIKE.

A CORRESPONDENT writes:—"Kindly permit me to state facts. The present strike of carpenters and joiners is the most unjustifiable that we have ever had. They are paid 9*d*. per hour and, as a rule, work 52½ hours per week, making 1*l*. 19*s*. 4½*d*., and are paid overtime extra at 1*d*. first hour, 2*d*. per hour up to 8 o'clock, and half-time extra 8 to 12 and double time after 12 P.M. Now they want 10*d*. per hour and to work 47 hours, making 1*l*. 19*s*. 2*d*. per week. What can be their object to work for 2½*d*. per week less? I answer this is their motive—because they well know that 47 hours per week is a loss to the master builders in numerous ways, such as the idleness in which their horses and carmen, &c., will be kept, and the slow progress business would make, so they think the masters will give in and allow them to make overtime of 5½ hours, which will make 52½ hours per week, and they ask 1*s*. 3*d*. per hour from 5 to 8 P.M., and 1*s*. 8*d*. per hour from 8 P.M., and on Saturdays overtime to commence at 12 noon and to be paid 1*s*. 8*d*. per hour; if allowed to work 5½ hours overtime per week at 1*s*. 3*d*. per hour will add 6*s*. 10½*d*. to the 1*l*. 19*s*. 2*d*., making a total of 2*l*. 6*s*. 0½*d*. for 52½ hours. Observe, they are willing to work any number of hours, although their principal argument is that if they work only 47 hours per week it will enable a reduction to be made in the ranks of the unemployed and give them greater recreation and more time for study. This overtime is their great point, and they know it, hence their principal argument falls to the ground. The public generally are not aware that this increase upon 52½ hours will add at least 17 per cent. to the labour value of the weekly wages over that which is now paid, and when they fully understand this to be the case I fear they will by every means reduce their wants for such exorbitant labour value. It is not only the carpenters and joiners that are craving for the increase; the present strike is only the forerunner for all other mechanics and labourers. It is shameful that so many thousands of families who were once happy and comfortable are brought to starvation and ruined by this strike. Why don't the heads of these families act like men and leave the union, and stand up as a body and go to work and set at defiance the promoters of this strike, also the pickets, the "catspaw," and also you non-unionists act like men without fear and trembling? The joiners of London are driving a large amount of their trade into the country, and will also set the

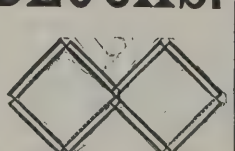
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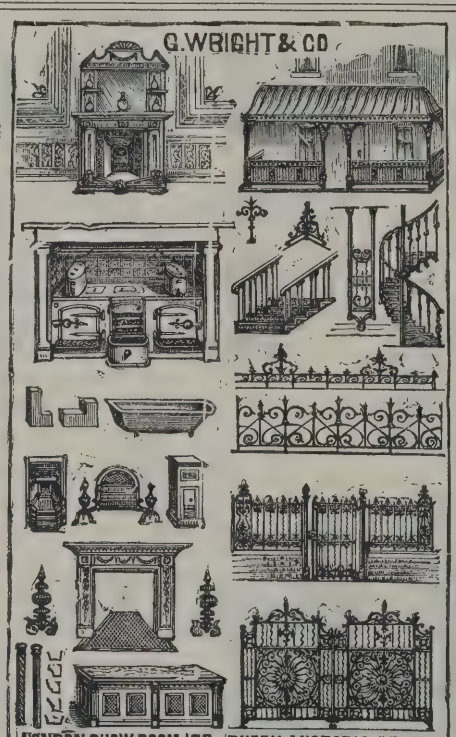
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foreigner thinking how he shall introduce into the market better joiners' work than he at present makes. I strongly advise not to sneer at the American or Swedish joinery; they can improve. Englishmen cannot rule the world. John Bull can be beaten. Do not let me hear an English mechanic run down the Irish boycotting. What is the difference between this and picketing? I trust the law will shortly step in between and put a stop to this cursed intimidation of the honest and hard-working man."

TENDERING IN PENNSYLVANIA.

A RATHER interesting point has been decided in the Supreme Court of Pennsylvania. There is a statute in that State requiring contracts for public work to be awarded to "the lowest responsible bidder." Not long ago, says the *American Architect*, bids were invited by advertisement for certain public work, and in the advertisement the right was reserved "to accept or reject all bids as the best interests of the city may demand." All the bids received were rejected, and another advertisement was made. The lowest responsible bidder under the first advertisement claimed the contract, in accordance with the statute, which says nothing about reserving the right to reject all bids, and makes no exception to the provision that the lowest responsible bidder must be awarded the contract. The question appears to have been whether the first advertisement was an absolute invitation for proposals, such as the statute contemplated, or only a provisional one, conditioned upon the decision of the proper authorities that the bids received under it were such as the best interests of the city demanded. The Supreme Court upheld the latter view, and decided that no responsibility was incurred to the lowest bidder, under the first advertisement, by the rejection of all the bids. This is not the first time that contractors have met with disappointment through too great reliance on their interpretation of the meaning of this particular statute. Some years ago a large public contract was awarded to a person who was not the lowest bidder. The contractor who made the lowest offer sued to have the contract awarded to him under the statute. He proved that he had ample capital and long experience in the business, and claimed that he was the lowest responsible bidder and was entitled to the work. The defence was that the commissioners who had in charge the matter to which the contract related thought that they had reason to believe that the lowest bidder was intemperate, and that he had been guilty of dishonesty and attempted bribery in connection with another public contract. It was proved that these impressions in regard to the bidder were groundless, but the Supreme Court held that, if they had been well founded, the commissioners would have been justified in considering that a man who had been guilty of such misdemeanours was not a "responsible bidder" within the meaning of the statute, whatever his financial standing might be, and while it expressed astonishment that the commissioners should have given credence to such rumours about a man without ascertaining the truth by inquiry, it held that their discretion was absolute, and that, in the absence of fraud, their decisions were not subject to review by the courts.

THE MONIER BUILDING SYSTEM.

SPECIMENS of material, models and illustrations of works completed under the Monier building system have lately been exhibited at 183 Upper Thames Street. The patent consists of a certain combination of iron and cement, based upon the fact, first discovered by M. Monier (and fully worked out by the well-known engineer, Mr. Wayss, of Berlin), that the expansion and contraction of iron and cement are equal, and that they likewise possess great affinities, uniting firmly and forming one solid, indestructible mass. The iron, being embedded in the cement, does not oxidise, nor will atmospheric changes affect the affinity between the iron and the cement. Among the most important advantages possessed by the Monier system are, that buildings so constructed are fire and waterproof, while at the same time a maximum amount of strength, combined with lightness and elegance, is attained. Great economy is also claimed for it, the patentee stating that it can easily compete in price with, and in many cases is far cheaper than, any other material. The system has been employed extensively in Germany and other parts of the Continent, and seems to be applicable to an almost endless variety of purposes; and we are told that it has stood the severest tests of fire, water, extreme pressure, &c. The last use the company have applied their process to is the construction of street and railway bridges, tunnels, and sewer and drain-pipes, and their success in this field appears to have been at least equal to their other operations. A very simple machine for the construction of drain-pipes up to 5 feet in diameter is on view at the above premises, and which, it is claimed, turns them out cheaper than stoneware, and practically as strong as cast-iron.

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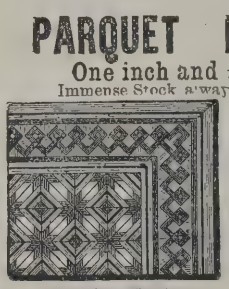
A SPECIAL meeting of the District Council for Ulster was lately held in one of the committee-rooms of the Municipal Buildings, Belfast. The meeting was well attended, Lisburn, Bongor, &c., being represented as well as the Belfast District. Professor Thomas Sinclair, F.R.C.S.E., in the absence of the Mayor, was called to the chair. The business before the meeting was the consideration of a Bill drawn up by the Worshipful Company of Plumbers, London, to define and legalise the registration system. The various clauses were fully discussed, and the principle of the Bill strongly approved of. Mr. Wm. M'Cammond, J.P., T.C., chairman of the Improvement Committee, was called upon to preside whilst a vote of thanks was tendered to Dr. Sinclair for his dignified conduct in the chair. Arrangements were also made to have the subject brought more fully before the public, who will be the chief gainers by the proposed changes.

THE BIRMINGHAM TOWN HALL.

THE architects and contractors, says the *Birmingham Post*, as well as the Estates Committee, are to be congratulated upon the expedition with which the works determined upon at the Town Hall have been carried through. Their magnitude may be realised when it is stated that they involve a cost of about 10,000*l*., 7,000*l*. of which is for structural alterations. In a fortnight's time the interior of the hall has to be ready for the Festival rehearsals, and there will then only remain to be done some minor details in connection with the corridors, &c. Already the scaffolding required for the interior work has been removed, and although the organ-front has to be completed, and one or two finishing touches have to be made, the effect of the redecoration can now be judged of. The Estates Committee, for some mysterious reason were very secretive with regard to the designs for the redecoration, and the City Council were afforded no opportunity of inspecting the drawings. A number of designs were submitted by firms of decorators, and one prepared by Mr. John Taylor, of Five Ways, was accepted, subject to modifications suggested by the architects (Messrs. Cossins & Peacock). The result will, we believe, upon the whole give general satisfaction. The treatment is entirely different from that which it has replaced, and which, it will be remembered, was of a very elaborate character. The present design is strictly Roman-Grecian, and in that respect is in perfect harmony with the architecture of the building. There is very little ornamental painting, but greater importance has been given to the structural mouldings and enrichments, which are in themselves of a very beautiful character. The prevailing hues in the upper portion of the hall are a tint of yellow known as "maize," with lines and panels of terra-cotta, a considerable surface of cream or vellum, with the occasional relief obtained from turquoise blue, and a very large employment of gold, both in lines and upon the decorative moulding. The effect is to reflect a large amount of light, and to add considerably to the apparent size of the hall. To enter more fully into detail it may be stated that the walls beneath the galleries are of Pompeian red, and the iron columns of olive green. The base line of the gallery front is of cream tint, with a line of turquoise, and the vertical "stiles" cream, with a terra-cotta panel. Between these the open ironwork is of gold, which is shown against turquoise wood panels in lieu of the red cloth which was formerly used, and which collected a large amount of dirt. The wall-spaces immediately above the side galleries are treated in flat colour, which will be sufficiently broken by the spectators seated in front when the hall is in use. The projecting piers beneath the Corinthian pilasters are of a soft neutral-toned terra-cotta, and the wall-spaces between them of a sage or ash-leaf green, merely relieved by lines of terra-cotta, marking out a bold panel. The moulding which forms the base of the pilasters is principally of cream, with small longitudinal panels of turquoise, small gold pateræ, and an occasional gilded line. On the wall-spaces between the bases of the pilasters is a cream or vellum band, with a very graceful line of old gold colour, broken at intervals into a kind of upward curl. Above this vellum is a more emphatic band of terra-cotta, with upright fluting of lighter toned red, gold and black. The pilaster shafts are of cream, with no shading or picking out of colour, the flutings making their own effect of light and shade; while the acanthus leaf capitals are of gold, with the turquoise blue occurring again by way of relief in the deep background. The wall-space beneath the windows is in two tones of full maize yellow with horizontal lines of terra-cotta. This, however, is only temporary, it being proposed that these spaces shall hereafter be filled with cartoons, in the preparation of which an opportunity may be afforded to the students of the Municipal School of Art. The lighter maize tint is carried up and around the windows, but the mouldings of the latter have been amplified by a strap-line of terra-cotta forming a pediment over each

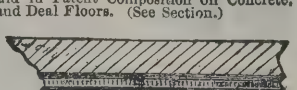
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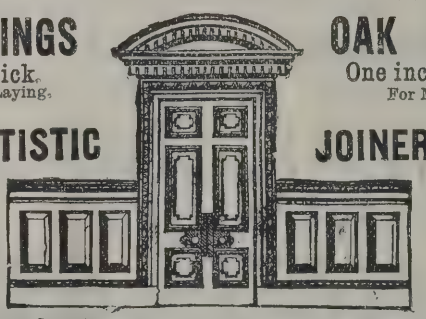
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window top, and terminating with a scroll at the bottom of each side. The "reveals" or sides of the window recesses, have decorative terra-cotta panels, with gold mouldings, and the window bars are painted golden yellow. The resulting effect is very soft and bright. The eye next ascends to the frieze, in which cream and gold are again largely used, with a somewhat emphatic band of terra-cotta, with stencilled enrichments of a paler tint, and the insertion of a small lion's head in black and white over the capital of each pilaster. Sage green also appears by way of relief on the "soffit" between the gilded bracket-like structures, technically known as "modillion blocks," which support the chief moulding. In the treatment of the ceiling flat enrichments are very sparingly used, and, indeed, there is little need for them, as the mouldings themselves are a very fine decorative feature. In the cove, turquoise is very happily used for the inner flat surfaces of the bold square panels which there occur. The moulded rosettes in the centre of each are of cream and gold, and there is a border of Greek key pattern in red on cream ground to each panel. The honeysuckle and other similar mouldings on the ceiling are gilded, as well as the pierced iron-work of various openings, the shades of which cannot be distinguished from black colour. A prominent feature in the ceiling are some very large floral rosettes, in connection with which a very happy treatment has been followed. The main tint is cream, with the back of the curling leaves gilded, and a golden suffusion introduced around the depths of the central bud. Blue, gold and terra-cotta are employed in the decoration or the minor panels, with conventional honeysuckle ornament occasionally introduced on the flat. Around the large wheel-like panels, where a little extra relief is needed, a pink ribbon of cable design is painted, and in some of the longer panels there is depicted a Greek staff, encircled with leaves. There are a few Greek key mouldings of the ceiling, which, like the flutings of the pilasters, are sufficiently distinct by their own shade when coloured with a cream tint, and no picking out of them has been attempted. Altogether the treatment of the ceiling, while chaste and simple, is remarkably effective, and does the designer great credit. In the decoration of the organ-pipes gold, cream and silver are largely used, with horizontal bands of turquoise blue, and various enrichments on the larger surfaces, in harmony with the general decorative scheme.

The effects of the structural alterations of the hall are now apparent. We believe it will be agreed that they enhance the appearance of the approaches, and that they will minister to the safety, convenience and comfort of the audiences which will assemble in the building. The architects have shown not a little ingenuity in the rearrangements which have been effected, but at the same time they are alterations in the direction of simplicity where previously very clumsy devices had been adopted. Instead of cramped-up entrances at the front of the hall, with opposing currents of people, and scarcely any accommodation for persons waiting for the calling up of their carriages, it will be found that the hall can be both entered and quitted with comfort. We doubt if any one will be able to detect that about 6 feet have been "pinched" from the floor of the hall. The street door opens immediately into an entrance-hall measuring 65 feet from right to left, and about 12 feet deep. The architecture of this apartment is Classical, with square lintels, appropriately decorated, fluted pilasters, coffered ceiling, and cornice of modillion blocks. The walls are dadoed with brown and white alabaster, and the upper portion will be coloured a warm cream tint, forming a suitable introduction to the still warmer yellow scheme of decoration in the great hall. It was at first proposed that the dado should be of polished Anglesey marble, but it was found that alabaster was the only material which could be worked in the limited time which was available. The floor of the entrance-hall is asphalted. In the centre of the apartment seven marble steps, 16 feet wide, ascend between projecting piers to the outer swing-doors of the great hall. The doors are of oak, glazed in the upper portion with stained-glass, and having a central panel beautifully carved by Mr. Bridgman, of Lichfield. The doors are in three sets, and are divided by handsome bronze shafts supplied by Messrs. Winn & Co. At a space of 5 feet 6 inches further inwards are a second set of swing doors, so that no draught should be occasioned to the occupants of the hall by persons entering or leaving. The stairs to the floor, although the central, are not the only feature of the new entrance lobby. Right and left of the flanking piers are staircases, 5 feet 6 inches wide, leading straight to the basement, where the ladies' and gentlemen's cloakrooms open out of a common apartment. Further to the right and left are recesses, with movable counters, for ticket-office purposes, and to the extreme right and left, although still directly facing the street, are the new stairs to the great gallery. With one turn to right or left these staircases will lead to a very cleverly-arranged intermediate floor or crushroom extending over the entrance hall below. It, of course, is not so lofty, but is amply spacious, and in the daytime derives light from windows in the pavement of the peristyle. Further, although constructed beneath the

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great gallery, it is fireproof, and is not devoid of decorative features, in the way of a bold balustrade protecting the top of the stairs, and fluted mouldings to the supports. A passage at each end leads past the lavatories to widened staircases giving access to the great gallery either at the centre of each side, or at the top corners. In both instances stone stairs have been substituted for wood. The whole rearrangements at this end of the hall have removed elements of danger both as regards inadequate means of exit and highly combustible wooden structures. In connection with the cloakrooms in the basement spacious lavatories have been constructed, with light and air derived from areas beneath the pavement in Congreve Street and Ratcliff Place.

It is scarcely necessary to repeat the particulars which we published a short time since of the alterations at the northern end of the hall. They include the construction of stone staircases leading direct from the entrance lobby to the orchestra at each side of the organ, the substitution of a stone passage behind the organ at the level of the peristyle in lieu of a wooden platform with movable trap, and the building of two independent stone staircases from the peristyle to the roof, so as to allow of access by firemen in case of any outbreak in the timberwork. These latter staircases have been provided by the removal of two columns, which were simply the decorative filling of corner spaces at each side of the organ recess. The old stone has been used in carrying out this work, and there is no detriment to the appearance of the hall. In addition to these improvements there has been provided an elaborate system for introducing warm fresh air into all parts of the hall. The air finds entrance down shafts from the peristyle, and, having been washed by a spray, is projected by two large Blackman propellers into newly-constructed ducts, 5 feet square, running round the hall, and in which the air is brought into contact with a system of hot-water pipes. Thence, having been warmed, it passes behind an inner wall, through various gratings beneath the side galleries, and through almost innumerable piercings in the flooring of the galleries themselves. The heating and ventilating system has been carried out by Mr. Wilson Phipson, of London, under the supervision of the architects, Messrs. Hart, Son & Peard supplying the pierced iron gratings, which are of a partly decorative character. The contract for the general structural work was taken by Messrs. W. & J. Webb, of this town, to whom great praise is due for the rapidity with which it has been executed. It is satisfactory to note that there has been no accident to the workmen who have been engaged on the undertaking, although there has been a large amount of scaffold-work, especially in connection with the redecoration, for which no fewer than 1,300 poles and between 500 and 600 scaffold-boards were brought into requisition.

HIGHER-GRADE SCHOOL, WOLVERHAMPTON.

AT the meeting of the Wolverhampton School Board on Friday last, the Chairman moved the adoption of a recommendation of the General Purposes Committee that, subject to the consent of the Education Department, the plans prepared by the Board's architect (Mr. T. H. Fleeming) for the higher-grade school, to be erected on the Newhampton Road site, be adopted, and that tenders be obtained for the consideration of the Board. He said that the plans had been carefully considered in committee, and he believed they would be found to be very complete. There would be a main building, consisting of a central hall, surrounded by classrooms for boys and girls, giving accommodation for 600 desks, though for the purpose of calculating the cost there would be accommodation for 727 pupils; and contiguous to the main building there would be the science and art section, consisting of laboratories, lecture theatre and art room. Near to would be another block for the technical section, and on the other side rooms for cookery and laundry teaching. A covered playground and gymnasium would be provided, and in addition there would be other rooms, one of which would be used for pupil teachers' instruction. He did not think that was an opportune time to go into the question of cost, which had been before the sub-committee from the outset, and a calculation was made based upon information received from other towns where higher-grade schools existed. Still, when the committee came to go into the complete scheme for this higher-grade school, the fact was forced upon their minds that the cost would be very much in excess of the original estimate made by the committee, an increase consequent upon the more elaborate scheme which the Board had seen fit to adopt. He should be sorry even to guess what the cost would be until the tenders were obtained. After some discussion about withholding information about the cost, the Chairman said the architect's figures were for the main building about 8,500*l.*; art and science section, 3,400*l.*; cookery and laundry section, 750*l.*; technical section, 400*l.*; covered playground and gymnasium, 1,000*l.* The Rev. Canon Davies said that would amount to 14,050*l.*, independently of



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the site, which had cost about 1,200*l.* There was an increase over the original estimate of about 6,000*l.* He thought 14,000*l.* was an enormous sum to spend on such a school. He was of opinion that it would be better to get tenders before sending the plans to the Education Department. The Chairman denied that there was an intention to mislead the public as to the cost of the schools, and held that the architect's figures were too high. It would be impossible to give up any part of the plans without mutilating the scheme. On a vote being taken, it was decided to send the plans back to the General Purposes Committee for revision.

ABERDEEN RESERVOIRS.

IT is proposed to construct new reservoirs and filter-beds in Aberdeen. That some improvement is urgently demanded is plain from the following extracts out of a report that has been prepared by a special committee:—It was not the sub-committee's intention, nor their desire, to dwell at considerable length on the various impurities, vegetable and animal, which detracted from the purity and quality of the water supply, but there were one or two of a serious nature which, in their opinion, invested the question of filtration with such importance that they considered they would be failing in their duty if they did not call attention to them. They referred more particularly to the presence of eels, leeches and other water reptiles in the water, and to the existence of low animal organisms in the shape of fungoid growths in the interior of the aqueduct. For many years complaints had been numerous among the consumers in various parts of the town about the presence of animal and other impurities in the water, and more especially of eels and leeches, and during the last year these complaints had been much more frequent, giving rise to grave apprehension of their being on the increase. A startling revelation was made during the progress of the works of repairing the old reservoir at Mannofield in the end of last year, when it was found on running the water off that the entire bottom of the reservoir was one seething mass of leeches. Steps were, of course, taken to destroy them, but their presence there in such overwhelming numbers could not be other than alarming and a matter for anxiety as to the utter inadequacy of the filtering arrangements at Invercannie to prevent their appearance in the water supply. For years the fungoid growth had been found during the summer months more or less thickly along the inner surface of the aqueduct for many miles below Banchory, and it had only been by the most unremitting vigilance by those in charge that it had been kept down and periodically removed. Every year, and sometimes twice a year, men were sent in along the entire length affected, and the surface of the aqueduct carefully scraped and washed clean. Unless carefully watched, and if allowed to remain until decomposition was beginning to set in, the work of cleaning became a difficult and objectionable task, the stench being such that the men were unable to remain for any length of time within. The prevention of such impurities in or contamination of the water was a matter for their most urgent consideration, and a question that must be immediately faced.

After frequent meetings and making a thorough investigation into all the details of the water-supply system, the committee unanimously came to the conclusion that additional filter-beds must be provided, so that the water might be delivered to consumers in a pure state, and entirely free from the presence of foreign bodies or other disturbing matters.

It might be urged by some that sewage contamination should be dealt with by the authorities representing the places where the pollution was created, and that that must be done in a considerable degree was true. It would, however, be a tedious and protracted undertaking to compel them to carry into operation the necessary works, and even when done, all experience went to show that both in the style of works carried out and in the superintendence and attention which they might afterwards receive, they would fall very far short of being so complete or effectual as to render the water pure and fit for domestic consumption. At present the evil, although not of alarming magnitude, was of sufficient importance to warrant a grave apprehension as to what might be the consequence to the inhabitants of Aberdeen, if an epidemic of cholera or typhoid fever were to break out in any of the villages of Upper Deeside, which now discharged their sewage into the river. Being agreed that the existence of such impurities must be prevented at all hazards, the question naturally arose how to intercept and free the water-supply from them. To that the reply was that a complete system of filter-beds must be laid down, so as to insure a thorough purification of the water. The existing filter-beds at Invercannie were laid down in 1866 by Mr. Simpson. They are circular in shape and two in number; have a total available sand area of 2,460 square yards, and are capable of filtering, when in good working order, about 1,700,000 gallons daily.

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The sub-committee are of opinion that both the storage and filtration accommodation is utterly inadequate and practically useless, and that the state of the water supply demands a large extension of this accommodation, in order that the water may be delivered to the inhabitants in that state of purity which they have a right to expect. The extension required to put the existing works into the state of efficiency that is necessary would doubtless cost what might be considered a large sum of money, but it was an expenditure which they were bound to face, and after all it was not such a large sum when compared with what towns of a similar or even of a lesser size than their own had expended in the purifying of their water supply. The ground adjoining the existing works at Invercannie, and lying between the private road belonging to the Council and the Burn of Cannie, was eminently suitable for an extension of the works, and the sub-committee proposed to acquire the whole of that ground. To the west of the existing reservoir there was ground sufficient to make two large settling reservoirs; but although they were of opinion that the whole of the ground should be acquired, at present they did not recommend that more than one settling reservoir should be constructed meanwhile. This reservoir would be capable of holding nearly 35,000,000 gallons, which, together with the existing settling reservoir, would be equal to seven days' supply. As the consumption increased, until the maximum limit they were empowered to draw from the river, and which the aqueduct was capable of carrying, was reached, the storage could be extended by constructing the additional reservoir, when a total storage of 9½ days will be available. To the east of the reservoir, and contiguous to the existing filter-beds, the ground is admirably adapted for laying down new filter-beds, and it is proposed to construct six filter-beds here. Five are sufficient to filter the quantity of water required for the daily supply, but another is necessary to allow the full quantity of water to be filtered while any of the other beds is being cleaned, which requires to be done about once a month. There is sufficient ground to the south and east of the filter-beds on which a further extension can be made. The committee do not anticipate, however, the construction of more than one filter-bed in addition to the six described; but it is desirable to purchase the ground on account of its position as an available area for conducting, cleaning and other operations, and also on account of its value as a source of sand—the most important element in the construction and maintenance of all filter-beds. The committee recommend accordingly that power should be taken to acquire the land, and to construct the works they have already described, the cost of which is estimated as follows:—

One additional storage reservoir	£28,000
Land for two storage reservoirs	4,000
Six additional filter-beds	27,400
Land for same, and extension	1,600
Contingencies	6,100
Total cost of lands and works	£67,100

In conclusion, the committee say that, although at the first glance this sum may appear large, the accommodation at Invercannie is so inadequate and obsolete that the works cannot be thoroughly equipped to meet the requirements of the present day without this expenditure. They have gone most carefully into every detail, with the light of the most recent and best experience of the country to guide them, and, after giving the question most earnest consideration, are unanimously of opinion that the whole works ought to be carried out; otherwise the water-supply of Aberdeen cannot be kept pure and efficient.

ASPHALTE PAVEMENT.

A RECENT bulletin of the United States Census Department shows that in 1889 the total amount of asphalte produced in the United States was 51,735 short tons, valued at 171,537 dols. Of this California produced 47,968 tons and Utah 3,163 tons; almost the whole of the remainder came from Kentucky. Nearly 500 tons, however, were obtained from the gilsonite of Utah, and this is said to be the purest yet found, containing 90 per cent. of bitumen in the crude mineral. The California deposits of Ventura country are in a bituminous rock, containing 24 per cent. of bitumen and about 64 per cent. of silica, with oxide of iron and calcium carbonate. The prices range from 8 dols. to 10 dols. per ton. The bituminous rock of San Luis Obispo and Santa Cruz is valued at 2·50 dols. per ton at the mines. The greater part of the supply of asphalte comes from Trinidad and the deposits of Seyssel, in France, and Val de Travers, in Switzerland. Cuba furnishes some excellent asphalte, and large deposits are reported to exist in Tabasco, Mexico, though little has been shipped from this place. The importation of asphalte into the United States may be said to have commenced in 1869, when 185 tons, worth 5,632 dols., were imported. This quantity increased until in 1889 61,952 tons, worth 138,163 dols., were imported. Of this 52,881 tons

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were from Trinidad. The imports of bituminous limestone from Neufchatel and Seyssel amount to about 200 tons annually; and about 150 tons of a similar material are imported from Hanover and Brunswick. During 1887-90 about 6,000 tons of bituminous limestone were imported from Sicily and used in street paving. The number of square yards of Trinidad asphalte pavement laid in the United States is now 6,803,054. In 1880 there were 106,838 square yards down, and in 1890 1,875,000 square yards were laid. About 72 per cent. of all the Trinidad asphalte imported is used for street paving, 24 per cent. is used in asphalte block and tiles for pavements, and 3 per cent. for roofing. The total area covered by bituminous limestone pavements in European cities is given as follows:—Berlin, 681,486 square yards: London, 360,000 square yards; Paris, 357,360; other cities, 300,000—total, 1,698,846. This is equivalent to about one-fourth of the area covered by asphalte pavement in the United States.

PUBLIC BATHS FOR BATLEY.

THE Batley Corporation have decided to erect some public baths in the town, and the Local Government Board has sanctioned the borrowing of the money which will be required. Building operations will be commenced forthwith, according to plans prepared by Mr. Walter Hanstock, architect, Branch Avenue, Batley. The site selected for the baths is on the Market estate, between Cambridge Street and Wellington Street. The building will front to Cambridge Street, and its dimensions will be 126 feet by 134 feet. For the most part the premises will be one storey high. The external appearance will be plain, but substantial; and whilst there will be no extravagant ornamentation inside the building, the best materials are to be used, and there will be a general look of comeliness about the place. There are to be two swimming-baths, first and second-class. The latter will measure 91 feet by 49 feet, with a water measure of 75 feet by 30. Dressing-boxes will be arranged on three sides, and above these there is to be a spectators' gallery, because it is intended that in this bath swimming matches and entertainments shall take place. The first-class swimming-bath is to be on the Wellington Street side. There will be a water measure in this of 63 feet by 25 feet. Arrangements have been made for twenty second-class and ten first-class slipper baths, with necessary appurtenances. The provision of a set of Turkish baths, with a cooling and dressing-room, a first hot-room, second hot-room, a small third hot-room, and a shampooing-room, will no doubt be much appreciated by many people of the town. Glazed bricks are to be used very extensively, and this will entail a greater expenditure than would otherwise have been necessary. However, it is estimated that the cost will come within the sum of 10,000*l.*, which it was originally decided to spend over the baths.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

14253. Albert Deacon, for "Tools for making hinges."

14267. Samuel Handscombe and William Smith, for "Improved apparatus for increasing the draught of fires for consuming smoke, particularly applicable to domestic fireplaces."

14271. John Poat and Charles James Watts, for "An improved form of boiler for hot-water circulation or other purposes."

14339. Herbert Drake Whiteley, for "Improvements in wearing surfaces for floors and other objects."

14375. Henry Harris Lake, for "Improvements in door-checks and closers."

14406. Robert Waugh, for "An improved spring bolt."

14435. Thomas Bailey, John Lowe and Thomas Fletcher, for "Improvements in padlocks."

14476. John Trimming, for "A combination instrument for the use of architects and surveyors, called the 'Architect's Desideratum.'"

14507. Warren Howard Taylor, for "Improvements in and relating to locks."

14560. Robert Adams, for "Improvements in springs for doors and analogous articles, and in adjustments and checks for preventing slamming."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CASSELL, Patent Agents, 37 Chancery Lane, London, W.C.

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Lower Seymour St., Portman Sq., W.
Late of 100 NEW BOND STREET).
DESIGNS PREPARED AND ESTIMATES GIVEN.

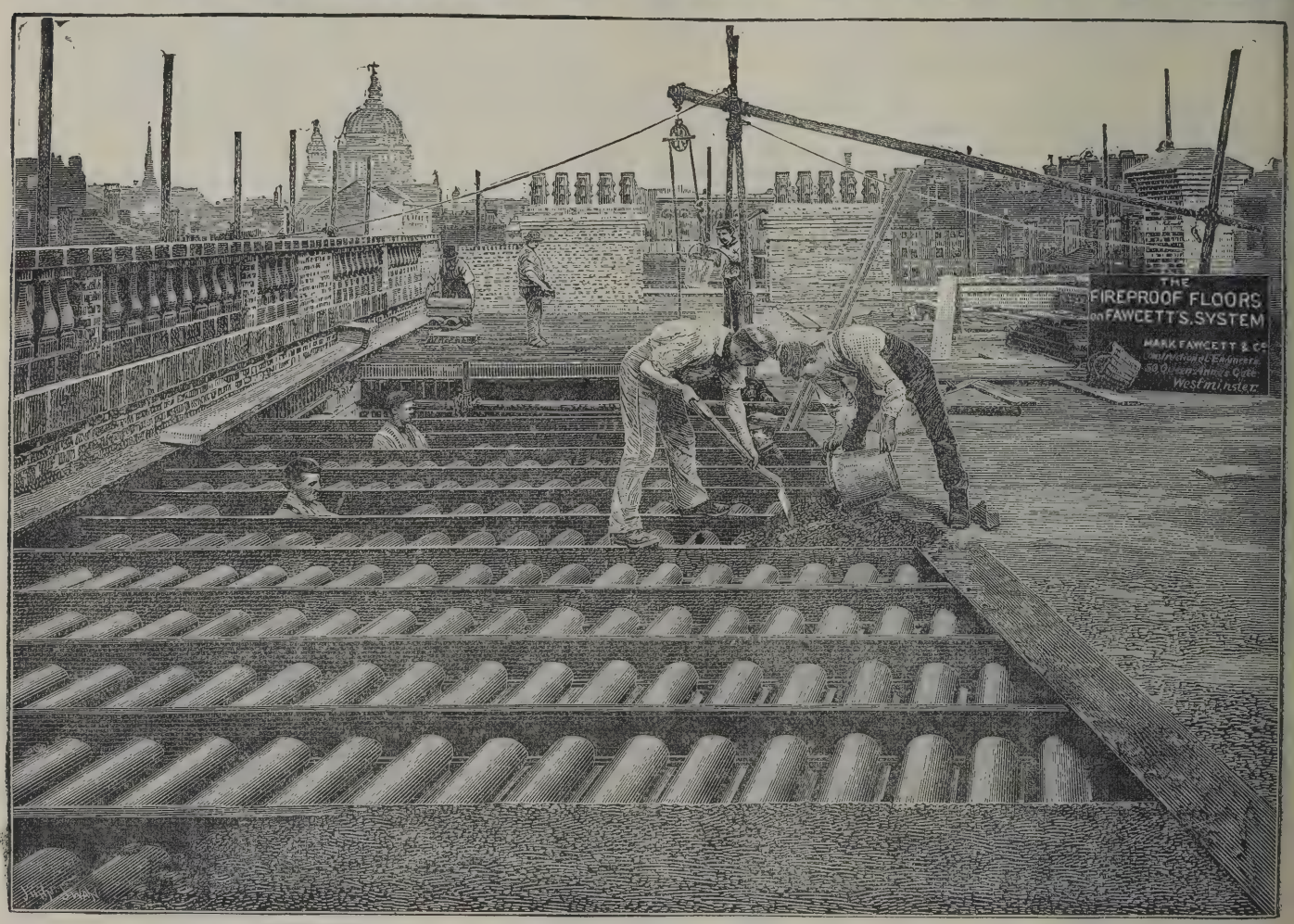
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The Contract Reporter.

to The Architect.

LONDON, SEPTEMBER 18, 1891.

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COMPETITIONS OPEN.

BATH.—Oct. 31.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

EASTLEIGH.—Sept. 28.—Plans are required for Sewerage and Sewage Disposal. Mr. Joseph Robins, Clerk to the South Stoneham Rural Sanitary Authority, 19 and 20 Portland Street, Southampton.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

GUILDFORD.—Designs are invited for Building High School for Girls. Secretary, Church Schools Co., Limited, Church House, Dean's Yard, Westminster, S.W.

SHREWSBURY.—Sept. 30.—Designs, &c., are invited for Building Police Station, Constable's House, &c. Mr. W. C. Eddowes, Borough Surveyor, The Square, Shrewsbury.

SOUTH STONEHAM.—Sept. 28.—Designs, &c., are invited for Sewerage and Disposal of Sewage. Mr. Joseph Robins, 19 and 20 Portland Street, Southampton.

VICTORIA, BRITISH COLUMBIA.—Designs are invited for Christ Church New Cathedral. Mr. Owen T. Bulkeley, Church House, Dean's Yard, Westminster, S.W.

CONTRACTS OPEN.

ALDERSHOT.—Sept. 19.—For Reconstructing Sewer Outfall Major S. Waller, Commanding Royal Engineer, South Camp Aldershot.

ASHTON-UNDER-LYNE.—Sept. 19.—For Constructing Gas holder. Mr. David Clarke, Gas Offices, Ashton-under-Lyne.

BARNET.—Sept. 30.—For Making-up Park Road and Laying Pipe Sewer. Mr. W. H. Mansbridge, Surveyor, 140 High Street, Barnet.

BATLEY.—Sept. 18.—For Rebuilding Alexandra Mill. Mr. Walter Hanstock, Architect, Branch Road, Batley.

BELFAST.—Sept. 28.—For Constructing High-Level Sewer and Works in Connection. City Surveyor, Town Hall, Belfast.

BLACKPOOL.—Sept. 30.—For Materials and Building Promenade Pier. Mr. Thos. P. Worthington, Engineer, South Shore, Blackpool.

BLACKWALL.—Oct. 12.—For Constructing (by Compressed Air) and Maintaining Carriageway and Footway Tunnel under the River Thames. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

BREDBURY.—Sept. 21.—For Building Houses. Mr. J. Robinson, Commercial Hotel, Bredbury.

BRISTOL.—Sept. 21.—For Building part of Church. Messrs. Henry Crisp & Oatley, 27 Clare Street, Bristol.

BRISTOL.—Sept. 23.—For Building Two Pairs of Semi-detached Villas. Mr. A. Barratt, Surveyor, Somerset Chambers, Corn Street, Bristol.

BROMLEY.—Sept. 21.—For Levelling and Tar Paving School Yards. Mr. Cregeen, Surveyor, School Board Offices, Bromley, Kent.

CARDIFF.—For Building Chapel. Messrs. Habershon & Fawckner, Pearl Street, Cardiff.

CARDIFF.—Sept. 30.—For Alterations and Additions to Free Library. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CARLISLE.—Oct. 1.—For Building Public Library, Museum, School of Art, &c. Mr. W. Howard Smith, City Surveyor, 36 Fisher Street, Carlisle.

CASTLETON.—For Building Houses and Shops. Mr. S. Land, Architect, 57 Heywood Street, Castleton.

CHARLTON.—Sept. 22.—For Supplying and Fixing Wrought-iron Fencing. Architect of the London County Council, Spring Gardens, S.W.

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CWMTAFF.—Sept. 28.—For Building Dwelling-house. Mr. E. Lumley, Architect, 24 Castle Street, Merthyr Tydfil.

DARENTH.—Sept. 25.—For Erecting Brick Building. Mr. T. Duncombe Mann, Metropolitan Asylums Board, Norfolk House, Norfolk Street, Strand, W.C.

DUKINFIELD.—For Building Inn and Cottages. Messrs. J. Eaton & Sons, Architects, Ashton-under-Lyne.

DUNSFORD.—Sept. 28.—For Building House, Poole Farm. Mr. E. Ellis, C.E., Bedford Circus, Exeter.

EDMONTON.—Sept. 22.—For Road Rolling and Scarifying, also for Supply of Broken Granite. Mr. G. Eedes Eachus, Engineer, Town Hall, Edmonton.

FENNY STRATFORD.—Sept. 29.—For Supply of Cast-iron Pipes, Valves and Hydrants, and Laying Water-mains. Mr. G. W. Branson, Surveyor, Committee Room, Bull Hotel, Fenny Stratford.

FERNDALE.—Sept. 26.—For Building Chapel. Mr. W. Jones, Surveyor, 56 Fountain Street, Ferndale.

GALWAY.—Sept. 19.—For Ironwork of Swivel Bridge. Mr. J. Perry, Surveyor, County Surveyor's Office, Galway.

GLASGOW.—Sept. 26.—For Supply of Cast-iron Pipes.

HAMPSTEAD HEATH.—Sept. 29.—For Erecting Public Conveniences. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W,

HANWELL.—Sept. 21.—For Supply of Broken Granite. Mr. W. S. James, Local Board Offices, High Street, Hanwell, W.

HAVERSTOCK HILL.—Sept. 28.—For Extension of Laundry Buildings. Mr. T. Duncombe Mann, Metropolitan Asylums Board, Norfolk House, Norfolk Street, Strand, W.C.

HERNE HILL.—Sept. 29.—For Additions, Alterations and Repairs at Brockwell Park. Architect of the London County Council, Spring Gardens, S.W.

HERNE HILL.—Oct. 5.—For Supplying and Erecting Cleft Oak Fencing at Brockwell Park, Architect of the London County Council, Spring Gardens, S.W.

HOLBECK.—For Building Schools. Mr. T. B. Wilson, Architect, 12 East Parade, Leeds.

HUDDERSFIELD.—Sept. 23.—For Building Three Dwelling-houses, Stabling for Twenty Horses, Cart-sheds, Boundary Walls, &c. Messrs. John Kirk & Sons, Architects, Huddersfield.

HULL.—Sept. 18.—For Supply of Cast-iron Cylinders, Columns, Caps, Shoes, &c. Mr. A. E. White, Borough Engineer, Town Hall, Hull.

HULL.—Sept. 23.—For Building School. Messrs. Mawson & Hudson, Architects, Exchange, Bradford.

KIRKHAM.—Sept. 30.—For Constructing Brick and Concrete Conduit. Mr. E. Garlick, Engineer, 33 Winckley Square, Preston.

LONDON.—Sept. 22.—For Supply and Delivery of Engines, Boilers, &c., for Tug-boat. Mr. J. T. Denniston, 45 New Broad Street, E.C.

LONDON.—Sept. 24.—For Additions, &c., to Patent Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

LONDON.—Oct. 5.—For Supply of Gravel, &c., to Victoria Park and Battersea Park. Architect of the London County Council, Spring Gardens, S.W.

MANCHESTER.—Sept. 22.—For Building Offices for Refuge Assurance Company. Messrs. Alfred Waterhouse & Son, 20 New Cavendish Street, London, W.

MILE END.—Sept. 23.—For Erecting Two Furnaces. Mr. J. M. Knight, Vestry Hall, Bancroft Road, Mile End, E.

MORLEY.—Sept. 28.—For Building House and Shop. Mr. T. A. Buttery, Architect, Queen Street, Morley, near Leeds.

NORTH WOOLWICH.—Sept. 29.—For Rebuilding River Wall, and Supplying and Fixing Wrought-iron Fencing. Architect of the London County Council, Spring Gardens, S.W.

PENANG.—Sept. 29.—For Supply of Cast-iron Pipes. Mr. C. C. Lindsay, 167 St. Vincent Street, Glasgow.

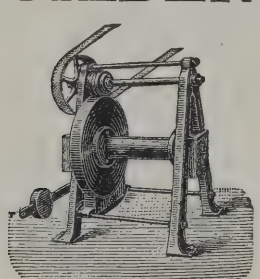
PENICUIK.—Sept. 30.—For Sinking Coal Pit. Mr. J. Love, Eastfield, Penicuik.

PETERBOROUGH.—Sept. 24.—For Supply of Granite. Mr. J. W. Walsham, Borough Surveyor, Guildhall, Peterborough.

PLYMOUTH.—Sept. 25.—For Alterations and Additions to Theatre Royal. Mr. J. D. Bellamy, Surveyor, Municipal Buildings, Plymouth.

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SALISBURY.—Sept. 26.—For Building Cottage. Mr. J. C. Bothams, Surveyor, Municipal Offices, Endless Street, Salisbury.

SEDBURGH.—Sept. 25.—For Building Dwelling-houses. Mr. Stephen Shaw, Architect, 45 Highgate, Kendal.

SHEFFIELD.—Sept. 24.—For Building School. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

SHIPLEY.—Sept. 28.—For Constructing Lattice Girder Bridge. Messrs. W. B. Woodhead & Son, Civil Engineers, 18 Exchange, Bradford.

SILVERTOWN, E.—Sept. 22.—For Erecting Close Boarded Fencing. Mr. Lewis Angell, Engineer, Town Hall, Stratford, E.

SOUTHAMPTON.—Sept. 22.—For Supply and Delivery of Broken Granite. Mr. W. B. G. Bennett, Surveyor, Municipal Offices, Southampton.

SWINDON.—Sept. 21.—For 10-ton Steam Road Roller. Mr. H. Kinneir, Local Board Offices, Faringdon Street, New Swindon.

TORQUAY.—Sept. 23.—For Supply of Cast-iron Pipes, Tees, &c. Mr. Thomas S. Weeks, Engineer, Waterworks Office, Torquay.

TWICKENHAM.—Sept. 23.—For Supply of Broken Granite and Flints. Mr. G. B. Laffan, Local Board Offices, Queen's Road, Twickenham.

WALTHAMSTOW.—Sept. 25.—For Supply of Broken Granite. Surveyor to the Local Board, Town Hall, Walthamstow.

WARRINGTON.—Sept. 18.—For Building Chapel. Mr. R. Parry, 10 Grandidge Street, Rochdale.

WASHINGTON.—Sept. 23.—For Building School. Mr. J. Gibson Cowe, Architect, Curnmoor, Fence Houses.

WEDNESBURY.—Sept. 24.—For Construction of Pipe Sewers with Manhole and Lampholes. Mr. E. Martin Scott, Borough Surveyor, Town Hall, Wednesbury.

WEST HAM.—Sept. 22.—For Building Public Hall and Offices for the Town Council. Mr. Lewis Angell, F.R.I.B.A., Town Hall, Stratford, E.

WEST HARTLEPOOL.—Sept. 29.—For Constructing Streets. Mr. J. W. Brown, Borough Surveyor, West Hartlepool.

WEYMOUTH.—For Building Hotel. Messrs. Helyer & Hunt, Architects, Bournemouth.

WOOLWICH.—Sept. 29.—For Rebuilding River Wall. The Architect to the County Council, Spring Gardens, S.W.

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Pocock	3,933 0 0
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MID-KENT BUILDING WORKS (*accepted*)	3,700 0 0

For Erection of Coach-houses at the Railway Hotel, Beckenham. Mr. G. WARREN COOPER, Architect, Bedford Row House, Bedford Row, W.C.

WEBB (*accepted*)	£450 0 0

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For Building Drill Hall, Bridgend. Mr. P. J. THOMAS, Architect.

W. Francis, Bridgend	£1,090 0 0
C. James, Porthcawl	770 0 0
P. Gaylard, Bridgend	732 0 0
C. JENKINS & SON, Bridgend (*accepted*)	730 0 0

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For Erection of Hunting Stables, for Mr. R. Cave Browne-Cave, Colwall, near Malvern. Mr. G. H. GODSELL, Architect, Palace Chambers, Hereford.

W. WILCOX (*accepted*)	£1,322 0 0

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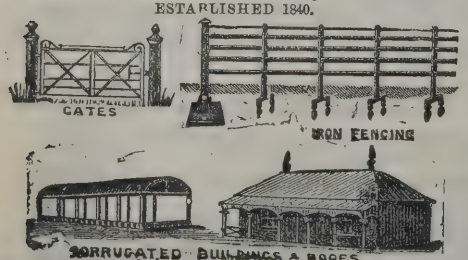
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Dove Bros.	2,895 0 0
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For Alterations to Business Premises, 45 Upper Baker Street, for Mr. G. S. Beeching. Mr. THOMAS DURRANS, A.R.I.B.A., Architect, 44 Upper Baker Street.

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For Sanitary Improvements, 28 Chapel Street, Belgrave Square, for Mr. J. Greenwood. Mr. THOMAS DURRANS, A.R.I.B.A., Architect, 44 Upper Baker Street.

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H. M. MOODY, Folkestone (*accepted*)	650 10 0

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Foxley & Co.	3,039 0 0
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J. Myring & Co.	2,945 0 0
Manktelow & Co.	2,727 0 0
J. Edgar	2,700 0 0

For Structural Alterations to 33 Beaumont Street, Marylebone, for Mr. W. Burton. Mr. THOMAS DURRANS, A.R.I.B.A., Architect, 44 Upper Baker Street.

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T. Stevenson	1,565 0 0
Manktelow & Co.	1,562 0 0
Savage & Co.	1,480 0 0
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J. Edgar	1,260 0 0

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Holloway Bros.	1,281 0 0
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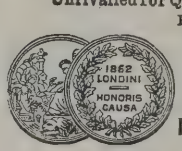
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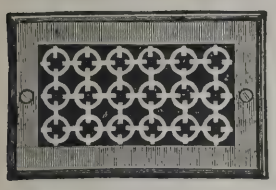
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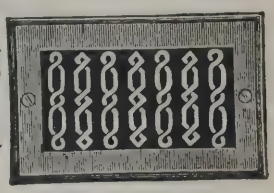
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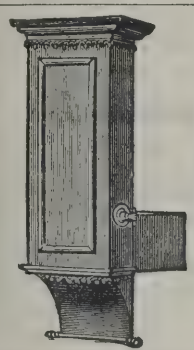
(Rd. Design.)

PLAIN IRON FRONTS.

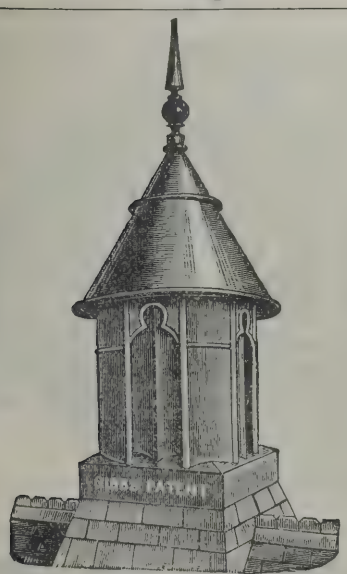
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CHEAPEST,
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GIBBS' IMPROVED VERTICAL INLET.

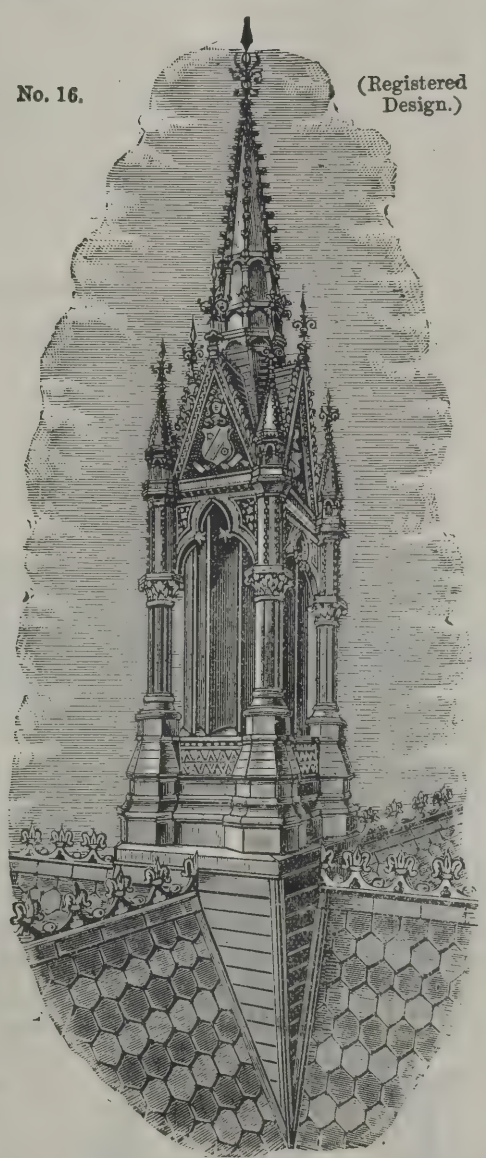


No. 7 (Inlet).
ORNAMENTAL BRACKET PATTERN.



No. 3 (Registered Design).
GIBBS' PATENT WEATHERPROOF EXTRACTOR.

No. 16. (Registered Design.)



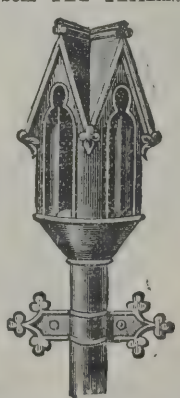
KINDLY
COMPARE MAKE
AND
PRICE.



GIBBS' IMPROVED VERTICAL INLET.

No. 4 (Circular Front).
STRONG GALVANISED BOARD SCHOOL PATTERN.

GOTHIC.
SOIL PIPE PATTERN.



(Registered Design.)
PRICE ON APPLICATION.

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Extractor, 12 in. dia.	.....	4½ to 6 in. pipe..	£1	11	6	Extractor, 20 in. dia.	.....	8 to 10 in. pipe..	£3	17	0	Extractor, 36 in. dia.	.....	14 to 18 in. pipe.. £9 15 0
„ 14 „	.....	5 to 7 „ ..	1	17	6	„ 24 „	.....	9 to 12 „ ..	5	5	0	„ 42 „	.....	16 to 20 „ .. 11 17 6
„ 16 „	.....	6 to 8 „ ..	2	12	6	„ 27 „	.....	12 to 14 „ ..	6	7	6	„ 48 „	.....	18 to 24 „ .. 16 15 0
„ 18 „	.....	7 to 9 „ ..	3	5	0	„ 30 „	.....	13 to 15 „ ..	7	10	0	„ 54 „	.....	20 to 27 „ .. 19 0 0

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SOUTHAMPTON.

For Strengthening Town Quay Extension, Southampton, for the Harbour Board. Mr. J. G. POOLE, Surveyor.

Roe & Co., Southampton	£333 0 0
SANDERS, Southampton (*accepted*)	308 0 0
Surveyor's estimate	325 0 0

SUNDERLAND.

For Alteration to Insane Wards at Workhouse. Messrs. J. & T. TILLMAN, Architects, Sunderland.

White, Sunderland	£133 0 0
Young, Sunderland	130 0 0
KIRTLEY, Sunderland (*accepted*)	116 0 0

SUTTON.

For Construction of Sewerage Works. Mr. J. B. POTTER, Engineer.

	Contract No. 1.	Contract No. 2.
H. Wilson, Walthamstow	£41,957 0 0	—
R. Facey, Taunton	36,780 0 0	£13,985 0 0
A. Kellett, Ealing	36,390 0 0	12,857 0 0
H. Hill, Maidenhead	33,484 0 0	—
J. Meston, London	28,465 0 0	15,640 0 0
J. Mackay, Hereford	27,960 15 0	11,694 8 6
B. Cook & Co., Battersea	27,308 0 0	9,975 0 0
R. J. Humphrey, Sutton	27,270 0 0	10,730 0 0
J. B. Potter, Sutton	27,000 0 0	10,100 0 0
G. Bell, Tottenham	26,885 0 0	—
F. Reeks, Lymington	26,217 0 0	10,704 0 0
W. Neave, Paddington	25,794 0 0	11,871 0 0
J. Neave, Canning Town	25,722 0 0	13,275 0 0
J. Hayward, Eastbourne	25,675 0 0	9,630 0 0
Perrin & Long, Winchelsea	24,900 0 0	9,870 0 0
H. T. Saunders, Westminster	24,700 0 0	11,100 0 0
W. Cunliff, Kingston	22,900 0 0	9,552 0 0
G. Hossington, Westerham	22,313 0 0	10,075 0 0
T. P. Hall, Southsea	21,361 0 0	10,583 0 0
F. Dupont, Colchester	19,142 0 0	8,896 0 0

For Erection of New Classroom and other Alterations, Sutton, near Hereford, for the School Board Committee. Mr. G. H. GODSELL, Architect, Palace Chambers, Hereford.

James Davies, Hereford	£398 0 0
Aldridge, Sutton	339 0 0
Jas. Lloyd, Hereford	215 0 0
J. J. Davis, Leominster	198 10 0
W. P. Lewis & Co., Hereford	195 10 0
R. ANDREWS & SON, Hereford (*accepted*)	195 0 0

SWANSEA.

For Erection of Grand Stand for the Swansea Cricket and Football Club. Mr. H. C. PORTSMOUTH, Architect, Swansea.

	For Stand.	Dressing-rooms.
J. D. Williams, Knighton	£1,635 0 0	£235 0 0
T. Watkins & Jenkins, Swansea	1,610 0 0	217 0 0
Bennett Bros., Swansea	1,520 0 0	210 0 0
W. Williams, Swansea	1,488 0 0	215 0 0
T. Richards, Swansea	1,453 0 0	200 0 0
Weaver Bros., Swansea	1,323 0 0	172 0 0

WELLINGBOROUGH.

For Erection of New House, Hatton Park, Wellingborough, for Mr. J. T. Parker. Messrs. TALBOT-BROWN & FISHER, Architects, Wellingborough.

E. Brown & Son, Wellingborough	£1,286 0 0
W. Stevens, Wellingborough	1,244 0 0
R. Marriott, Wellingborough	1,188 0 0
J. Underwood, Wellingborough	1,180 0 0
George Henson, Wellingborough	1,174 10 0
J. T. Hudson, Wellingborough	1,150 0 0
W. J. HARRISON, Wellingborough (*accepted*)	1,142 0 0

For Building Co-operative Stores, Stanley Estate. Messrs. TALBOT-BROWN & FISHER, Architects and Surveyors, Wellingborough.

E. Brown & Sons, Wellingborough	£1,169 10 0
J. J. Hudson, Wellingborough	1,108 0 0
R. Marriott, Wellingborough	1,086 0 0
G. Hacksley, Wellingborough	1,042 8 6
W. Stevens, Wellingborough	1,042 3 0
W. J. Harrison, Wellingborough	1,015 0 0
Geo. Henson, Wellingborough	1,009 12 0
H. DORMAN, Wellingborough (*accepted*)	1,002 0 0

BUILDING AND BUILDERS.

HERNE CHURCH, interesting as the place where Ridley first recited the "Te Deum" in English, has, says the *South-Eastern Gazette*, at length received the finishing touches of the restorer. The north aisle, with its eastward continuation, the Milles Chapel (divided from the aisle by the old rood screen which should be elsewhere), has been re-roofed in place of the old lean-to, and the balance of the fabric restored. The woodwork of the new roof is made of Jarrah wood, from Western Australia, which presents at once the appearance of rich dark

ALL KINDS OF TILES FOR FLOORS WALLS HEARTHS GRATES CHEEKS BATHS &C.
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Apply to the Bath Stone Firms, Ld., Bath.

mahogany, there being no waiting before the wood tones down. The contract has been carried out by Mr. H. B. Wilson, of Canterbury, who restored the nave of Herne Church in 1853, and in the interim has restored fifty-three Kentish churches.

THE conditions for contracts for the improvements in the channel of the Carraca at Cadiz have been issued. It is calculated that two million cubic mètres of mud will have to be removed in order to leave a depth of 8 mètres and 40 centimètres at low water. The different proposals of contractors will be examined on October 20—each proposal being accompanied by a deposit of 3,200*l.* Each estimate for the work to be "in price per mètre" for extraction and time required, but it is stated that not more than four or five years will be conceded. Work to be commenced within six months of the adjudication.

THE trustees of the Hospital of St. Mary Magdalene, Ripon, have obtained the sanction of the Charity Commissioners to erect six additional almshouses on the south side of the old chapel. The plans and specifications have been prepared by Mr. John Oldrid Scott. The whole of the work has been entrusted to Mr. Abel Trees, of Ripon, builder, who will commence the buildings at once, so as to get them roofed in before winter.

VARIETIES.

SOME of the wire and iron works in Warrington had to be closed last week on account of the extraordinary heat. The workmen refused to labour until the weather became cooler.

IT is proposed to erect a Roman Catholic church at the foot of Haley Hill, Halifax, as a memorial of the late Rev. Father Wake.

MESSRS. WEIGHTMAN & AMERY, architects and contractors, of Charlestown, Natal, are the successful competitors for a new church at Utrecht, Transvaal. Nine plans and specifications were sent in. The church is Gothic in design, with tower and steeple. It is to be built of stone, with tracery windows, and to have leaded lights filled with cathedral glass. The contract price is 8,493*l.*

ABOUT 10,000 crowns have now been subscribed in Sweden for the proposed John Ericsson monument.

A PAPER on "Retort Charging and Discharging Machinery for Gasworks," by Mr. Henry O'Connor, will be read at the meeting of the Society of Engineers on October 5.

TO make Portland cement proof against freezing, Herr Reinhofer, an Austrian engineer, recommends crystallised soda dissolved in water. In one experiment he used 1 litre of Portland cement to 1 litre of lime and 3 of river-sand. He mixed this with 1 kilo. of soda dissolved in 3 litres of water. The mortar thus made was exposed for fourteen and a half hours to cold of a maximum intensity of 31·5 deg. C., and was then put into a furnace for three hours. At the end of that time the "set" of the cement was found to be perfect.

THE Trustees and Directors of the Halifax Mechanics' Institution have decided that they do not feel justified in taking the responsibility upon themselves of building a technical school, but are willing to support the Technical Instruction Committee of the Corporation in attaining so desirable an object, and are prepared when the occasion arises to recommend to the members of the institution that the building be disposed of and the proceeds be devoted to the purposes of technical instruction in such a way as the members may resolve, the Mechanics' Institution to have the power of appointing a proportionate number of the members constituting the committee of management.

THE Port Glasgow Town Council have accepted the sum of 5,000*l.* from an unknown donor for the erection of public baths and wash-houses for the use of the inhabitants.

THE Earl of Portsmouth's mansion at Hurstbourne Park, near Whitchurch, Hants, which was destroyed by fire some time since, is to be rebuilt from plans which have been prepared by his son, Viscount Lymington, M.P., who will take up his residence there when the work has been completed.

THE Baptist Chapel, Kent Street, Portsea, was destroyed by fire on Tuesday morning. It was insured for 3,000*l.*

MR. DEACON, C.E., reports that the Cheshire shaft of the aqueduct tunnel under the Mersey has been sunk as deep as it is desirable to sink it until the tunnel from the Lancashire side has advanced further. On Saturday night the shield stood at 166 feet 9 inches from the centre of the Lancashire shaft, being an advance of 5 feet 1 inch during the week.

THE special sub-committee appointed by the Town Council of Glasgow to inquire into the cost and financial results to the Improvement Trust of erecting workmen's dwellings and a "family home" on vacant ground at the corner of High Street and Rottenrow have issued a report. The cost of the buildings is estimated at 18,100*l.*, and the cost of the site is recorded at 5,962*l.*, being 24,062*l.* in all, the annual interest on which sum

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is put down at 931*l.* It is thought that an annual revenue of 853*l.* would be got from the shops and houses, and that the "home" would yield annually 360*l.*, after paying all expenses, the total revenue being thus 1,213*l.*, leaving an apparent surplus over the annual charge of 281*l.* The committee recommends that the principle of the trustees themselves erecting the buildings be affirmed by the general committee.

THE Deganwy estate, situated midway between Conway and Llandudno, and comprising about 280 acres, chiefly fronting the sea, was sold by auction on Tuesday. The property belonged to the late Mr. Joseph Evans, of Haydock, colliery proprietor, who, it was stated, spent 68,000*l.* on its purchase. The property was purchased by Mr. Thomas Barker, high sheriff of Carnarvonshire, for 29,000*l.*

AMERICAN NOTES.

IT is proposed to hold an international engineering exhibition in connection with the Chicago Exhibition of 1893. The project has been well received and approved in England, Scotland, Ireland, France, Switzerland and Germany.

A STEAM hammer, weighing 125 tons, has been erected at Bethlehem, Pa. The pit for the foundation was 58 by 62 feet, and the foundation-walls are 20 feet in height. The anvil is built on a foundation of stone and timber, and has some 1,600 tons of iron in it. The top of the hammer is 90 feet above the floor of the shop; the steam cylinder is 4 feet in diameter and 16 feet 6-inch stroke. The piston-rod is 16 inches in diameter and 40 feet long. The hammer head is of cast-iron, the block being 19½ inches by 10 inches by 4 inches, and the die is of steel. The weight of the working parts is 125 tons and the fall 16½ feet.

THE Niagara Falls Tunnel is now excavated for 1,175 feet, or about one-third of the entire length, which is 3,530 feet.

A BUSINESS building 550 feet high is proposed for Lower Broadway, New York. The site would be next to the Washington Building, and the area to be covered would be about 162 feet on Broadway by 200 feet deep to Greenwich Street. The architect is Mr. F. P. Dinkelberg, and the estimated cost is 4,000,000 dols. There would be twenty storeys in the office building and six more in the tower, which latter would rise 260 feet above the roof of the building proper and 550 feet above Broadway. There would be 1,000 offices, with an average floor-space of 300 square feet for each office. The tower itself would contain offices. In general design it would follow the new type of architecture, in carrying the weight on a thoroughly tied and braced skeleton of iron and steel beams and posts, leaving the minimum weight upon the walls.

PROFESSOR W. S. CHAPLIN, Professor of Engineering at Harvard University and Dean of the Lawrence Scientific School, has been elected Chancellor of Washington University at St. Louis. Professor Chaplin is forty-three years old, a native of Maine and a graduate of West Point. In January 1877 he was appointed Professor of Civil Engineering in the Imperial University of Japan at Tokio, remaining until July 1882. While occupying this position he was called to take charge under the Minister of Public Works of the roads, railways, canals, docks, harbours and other engineering works of the empire. He resigned his position in Japan in 1882, receiving the Imperial order of "Meiji" of Japan in recognition of his distinguished services. On his arrival in his native country Professor Chaplin became engineer of construction for the New York and New England Railway, then constructing its double tracks from Franklin, Mass., to Hartford, Conn. In September 1883 he accepted the appointment of Professor of Mathematics in Maine College, from which place he was appointed in July 1885 Professor of Engineering in Harvard University. Some time ago a gift of 100,000 dols. was made to the Washington University by an unknown person, to be held in trust by three prominent citizens until a chancellor should be selected. The selection of Professor Chaplin releases the gift.

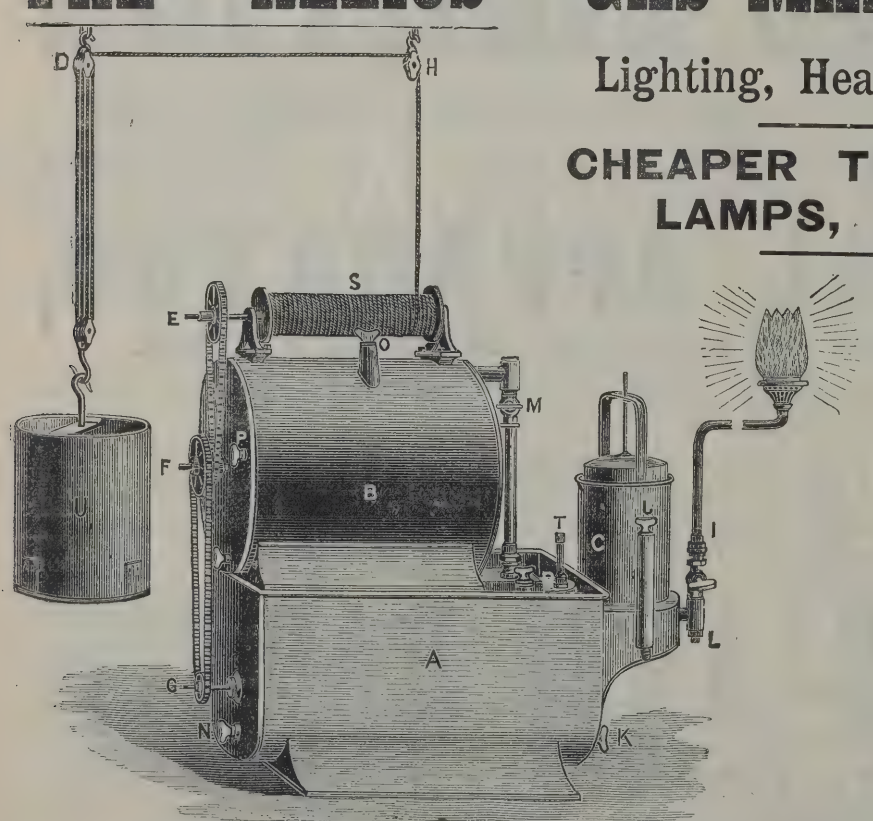
THE Detroit Dry Dock Co. have now in course of construction what is said to be the largest, most convenient and strongest dry dock on the entire chain of lakes. The interior dimensions of this large wooden dock will be 380 feet long on the keel blocks, 55 feet wide at the bottom and 91 feet at the top. In the construction over 2,000 piles have been used, and they are driven over every 6 feet square throughout the entire area of construction. As a preliminary undertaking there was formed a puddle wall 8 feet wide and back 12 feet from the edge of the dock, after piles had been driven; the filling-in was done with blue clay puddled in a concrete mass, and packed in from a depth below the level of the river-bed up to the surface ground, and connected to the outer cribs outside of the dock gate. The bottom of the dock is driven closely with piles, on which are mortised 12 by 12-inch frame logs; a sheathing of inch-pine is then laid, on which the flooring of 12 by 4-inch oak laps over the seams of the sheathing. The pumping apparatus

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is unequalled on fresh water. The dock will contain upwards of 3,500,000 gallons of water, and a pump well 35 feet deep, 25 feet long and 11 feet wide, built with 12-inch oak timber, is supplied by a brick tunnel from the dock, 5½ feet in diameter. To lower the level of this chamber there are two centrifugal pumps, each having a discharge of 30 inches in diameter, and worked by two separate Westinghouse engines of 150 h.p. The steel pontoon gate which is now being built is 80 feet long, 20 feet deep and 12 feet wide, weighing 75 to 80 tons, and requiring about 160 tons of concrete and scrap iron to ballast.

THE requirements of some of the buildings of the Chicago Exhibition have been underestimated. The building for manufactures will be increased by roofing over the inner court provided. The plans for the Government building will probably have to be changed. This structure was not to cost over 400,000 dols., but the tenders for it range from 410,500 dols. to 775,000 dols., not including the architects' fees, superintendence, &c. The proposition of M. Eiffel to build a tower has been rejected. It seems he only intended to prepare plans, leaving the responsibility for the foundations and erection with the Commission. Three Chicago contractors have offered to put up a tower 1,200 feet high, to cost 2,000,000 dols.

THE NEW CINCINNATI AND NEWPORT CANTILEVER BRIDGE.

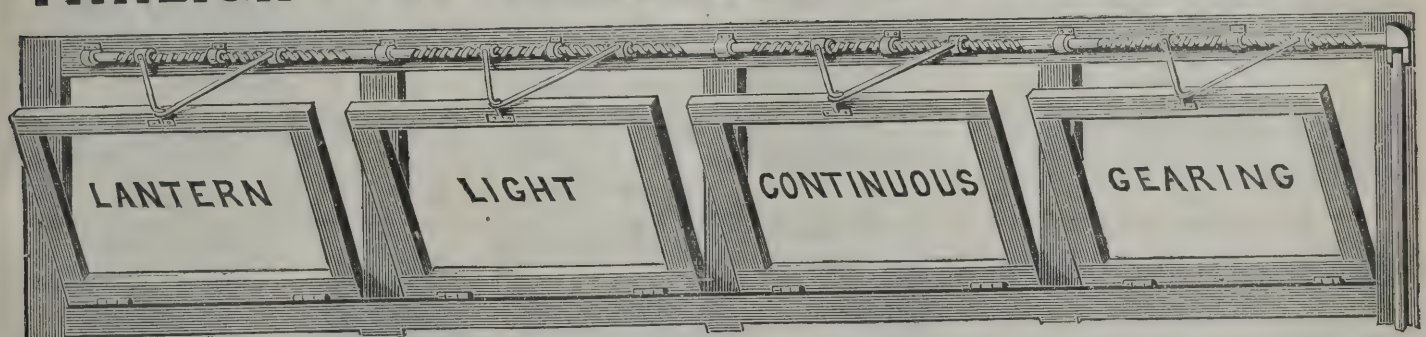
THE new steel cantilever bridge between Cincinnati, O., and Newport, Ky., was given over to traffic on August 29. The bridge is a highway bridge, and affords the first sufficient facilities for the convenient and rapid transportation of passengers, street cars and waggon freight between the two cities which it connects. From the south-east corner of Broadway and Second Street, in Cincinnati, there extends south-eastwardly a solid viaduct, enclosed with heavy masonry walls and paved with granite blocks for a distance of 282 feet. This is succeeded by a span of steel viaduct 150 feet in length, a steel truss of 108 feet, another span of steel viaduct 81 feet in length, and a steel truss of 162 feet, reaching to the lofty masonry pier at the edge of the Ohio River. At this pier begins the true cantilever construction. It consists of two end spans of 252 feet each, and a central span, crossing the channel, 520 feet in length. Then follow two spans of steel trusses of 254 feet each, plate girders 55 feet in length, 213 linear feet of steel viaduct, a plate girder bridge of 50 feet, crossing Eglantine Street, and 333 feet of masonry viaduct, paved with granite, leading to the corner of York and Taylor Streets, in the city of Newport. The total distance, from the corner of Broadway and Second Street to the corner of York and Taylor Streets, is 2,916 feet, or a little less than three-fifths of a mile.

The bridge consists of a roadway of 24 feet clear width, bearing two street railway tracks, built especially for electric cars and of extra strength; and of two sidewalks, each 7 feet in clear width. The lower chord, at the centre of the span over the channel, is 108 feet above mean low water, and the steel towers at each end of this span rise 85 feet above the masonry, and 190 feet above the foundations of the piers. The superstructure is supported on nine piers containing about 12,000 cubic yards of masonry, not including that in the viaduct and in the approaches. All the great piers in the river are placed on a foundation of solid rock. It is planned to carry, with perfect safety, a moving load of 85 lbs. per square inch, with additional provision for road-rollers, electric motors, and other heavy concentrated loads. The grades are all easy. In size, length and strength the bridge is said to be surpassed by but one highway bridge in America, and that is the East River bridge, connecting New York and Brooklyn. The bridge was designed and constructed by the King Iron Bridge and Manufacturing Company, of Cleveland, O. This company took the contract for its complete construction, including the purchase of right of way in Cincinnati and Newport.

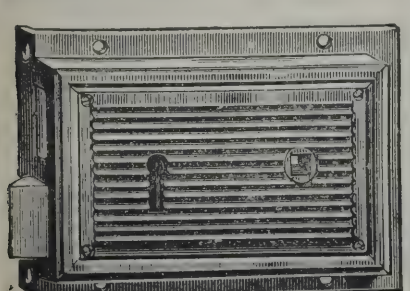
ASPHALTE AS A SUBSTITUTE FOR MORTAR.

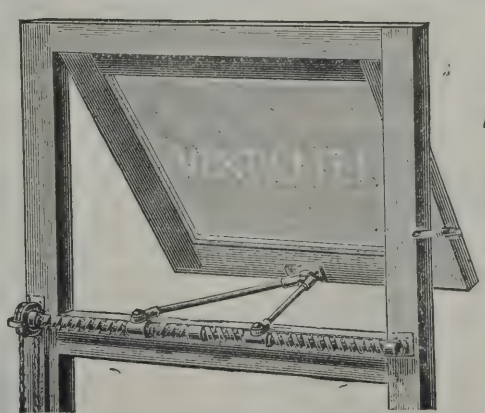
A PAPER was read by Mr. W. C. Ambrose before the American Society of Civil Engineers on "Asphalte in Building." He stated that the Ventura Division of the Southern Pacific Railroad was built for several miles along the bluffs facing the Pacific Ocean. The material of these bluffs is sand and gravel between strata of soft rock, soluble in water; and though the violence of the waves is moderated by a group of islands about 22 miles off shore, at high water of spring tides, with south-west gales, they wash away the bank very rapidly, and protection for the road in some places was soon found necessary. The seashore at the foot of these bluffs is generally covered two or three feet deep with boulders and sand over the hard bed-rock; hence the use of piling was impracticable. The rise and fall of tides, which would

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Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod.

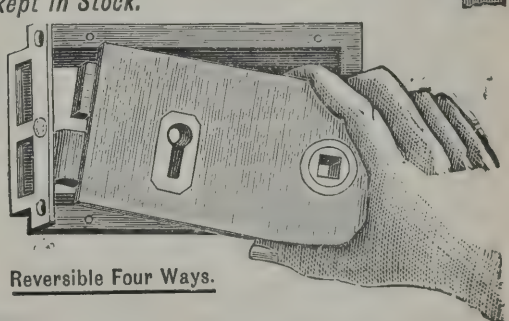




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Reversible Four Ways.

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interfere very much with the work of building a concrete wall, as well as the high cost of labour, would make such a wall very expensive, so it was decided to try the use of asphaltum for a mortar to hold the boulders together, as a wall made of boulders alone had been easily knocked down by the waves. At various points near this part of the road there are beds of material known as bituminous rock and asphaltum. The first contains fixed bitumen, 24·4 per cent., and ash 75·6 per cent.; the ash, consisting of silica, 46·8 per cent.; carbonate of lime, 9·1 per cent.; oxides of iron and alumina, 15·9 per cent.; and other ingredients, 3·8 per cent. This material is much used in California in making pavements, and in coating piles to resist the teredo, which it does effectually. In order to liquefy it when heated, coal-tar or crude oil must be added. About 200 feet of wall was built with this material, and it has stood perfectly for the last three years, and prevented any washing away of the bank. After building this section of wall, the other material, known as asphaltum, was tried because it was cheaper. It liquefies without the addition of any flux, and when cooled is not quite so hard but more elastic, and on the whole as good a cement as the other. It is often used for lining cisterns, and was used for 800 feet of this wall. The wall was made 6 feet wide at the bottom (where it was in contact with the bed-rock), 2 feet wide on top, and 9 feet high, the landward side, which was built close up against the cliff, being vertical. To economise asphaltum only one-half the wall, viz. 2 feet backward from the seaward face, was cemented. The cost was 3·75 dols., or 15*s.* 7½*d.*, per cubic yard, which included everything except the old ties for fuel, and rail-transportation 28 miles for the asphaltum. In building this wall a layer of stones was placed and the melted asphaltum poured over it so as thoroughly to fill all interstices and run down to adhere to the next layer of asphaltum. In warm weather the asphaltum becomes quite soft, but not liquid, and in this condition has little tensile strength, but the first spray from the waves hardens it just when necessary. The only part of the wall which failed was a short section where, to improve the alignment, it was built a little outside the base of the bank, the space between being filled with sand. During a heavy storm waves dashed over the top of the wall and saturated the sand, and the resulting increase in thrust from behind pushed the wall over. This, of course, could have been avoided by making the wall so high that spray could not fly over it, or by increasing the width of the base to resist pressure from the land side.

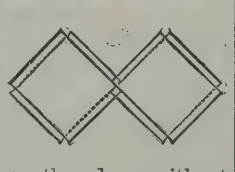
COLLAPSE OF BARMOUTH CHURCH.

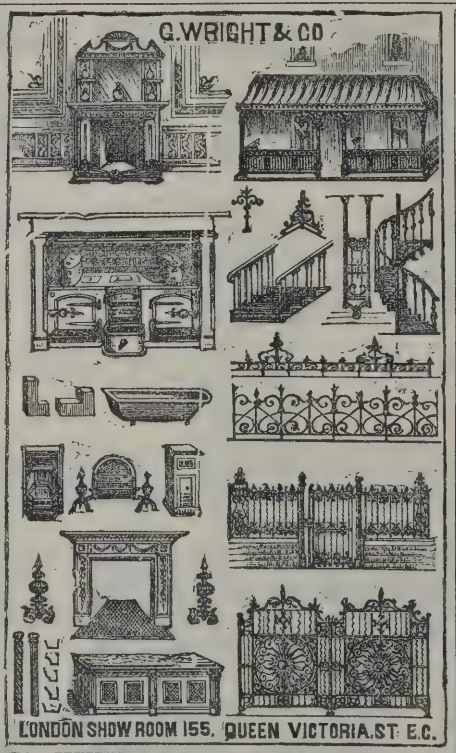
LAST year, during the Queen's visit to North Wales, Princess Henry of Battenberg, at the invitation of the Dowager-Marchioness of Londonderry, visited Barmouth, and laid the foundation-stone of a new church, designed principally for the accommodation of summer visitors. The site chosen was an excavation in the huge limestone cliff overlooking the estuary, and a lofty tower formed part of the design. After a considerable part of the design had been erected, it was found that some serious defect rendered the foundation unsafe. Great expense was then incurred in trying to strengthen the foundation by means of concrete buttresses, and the building was proceeded with. The roof had been got ready for the slates, and the tower had been built almost to its full height. Suddenly in the early morning of Saturday the tower collapsed and fell into the nave, utterly destroying the building. So far as has been ascertained no lives were lost, but the ruins are being searched. On Wednesday a meeting of the building committee was held to consider the best course of procedure with reference to the disaster to the new tower. It was estimated that the total loss will be upwards of 5,000*l.* Messrs. Douglas & Fordham, architects, of Chester, attribute the catastrophe entirely to blasting operations with dynamite among the rocks immediately at the back of the church. Those operations were undertaken in order to obtain more light for the church. The explosions had first shaken and eventually brought down the tower. The reconstruction of the tower and building will begin immediately.

THE PARK PLACE DISASTER AT NEW YORK.

THE flood of indiscriminate newspaper talk which has followed the frightful disaster in Park Place, New York City, is, writes the *Engineering Record*, about what was to be expected. Sensational clamour seems to be one of the essential requisites of average daily newspaper journalism, and in it the main facts, in any particular case, are generally completely hidden. Nothing, however, would seem to have been more uncalled for than the wholesale abuse which has been showered upon the New York Bureau of Buildings. With the appropriations available for the supervision of building construction and use the department has secured and maintained a reasonable degree of efficiency,

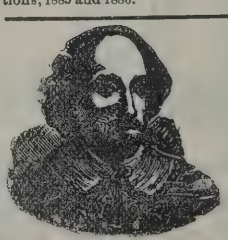
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and under the circumstances it is a little too much to expect it to shoulder the consequences of reckless mismanagement on the part of owners and tenants, of a multitude of buildings which originally had satisfied all the requirements for which they were designed.

With regard to the collapsed building, the testimony before the coroner's jury shows that the building was designed and erected twenty years ago under the direction of a competent architect, the upper floors being intended for offices and light business. A load of 200 pounds per square foot was provided for. In the changing character of tenancy, lithographing and printing establishments finally occupied the upper floor, and instead of subjecting the floors to a dead load of only 200 lbs. per foot, it appears that they were overtaxed to the extent of 700 lbs. per foot, after being weakened by years of vibration. It consequently needed only the fall of a case of paper, or some lithographic stones, to bring about the catastrophe which occurred.

The lesson to be learned from all this is that New York City imperatively needs a special Act making it mandatory on the part of the Fire Department to maintain a special bureau for the periodical inspection of all buildings occupied for business and manufacturing purposes. A special appropriation for the work of this bureau should be provided. There is a constant change of the character of tenants in the buildings in different districts of the city, and to expect the present Bureau of Buildings to keep track of such cases with its present force, where, from the wording of the law and extent of the appropriation, it is contemplated only to look after new buildings, alteration to old ones, and cases of special complaint, is unreasonable. It is to be hoped that the next legislature will authorise this needed protection to the working people of New York.

VANDALISM IN GLASGOW.

AT last week's meeting of the Town Council, Mr. Osborne said :—I am sorry to be informed by Mr. Macleod, one of our officers, that some member of the public who has been admitted into the corridors has used some implement, a knife or something stronger, and has defaced one of the principal alabaster pillars. It would be a very great pity if any member of the public should so conduct himself that the Town Council should find it necessary to exclude the citizens from wending through the stairs and corridors, but if such a thing occurs again it will be forced upon us to exclude them. I wish this statement to go forth to the public. We have resolved that these lobbies and stairs, except the marble stairs, shall be as free to the public as the pavements on the streets ; but this can only be continued by the public conducting themselves properly. This depredation has been committed since we assembled here to-day. The damage has been caused on the upper floor. We fear that it has been caused by some parties who have been going either to Mr. Henry's office or to the cleansing department, and who have wandered along and done the mischief. The alabaster pillar to which Mr. Osborne referred has been slashed near the bottom as with a strong knife or chisel.

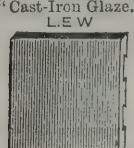
EMPLOYERS' LIABILITY UNDER FRENCH LAW.

AN examination of the legal relations of the working classes in France with their employers presents us, says the *Scotsman*, with what at first sight appears to be a very striking anomaly. Contrary to what might be expected in a great democratic Republic, in which over one-fifth of the entire population is dependent upon non-agricultural labour, the Code scarcely contains any provisions relating specially to the mutual relations of workmen and masters. This apparent hiatus in the Code is undoubtedly due to the fact that, notwithstanding the numerous regulations with which the acts of all French citizens in general are controlled, the Legislature has always been anxious to avoid any class legislation, fearing, as M. Paul Leroy Beaulieu expresses it, that "by any interference with the terms of contract respecting labour, the freedom of labour itself should be interfered with." The subject, indeed, if touched upon at all, is only alluded to in a very general manner. Thus, Art. 1,710 defines the hiring of labour (*louage d'ouvrage*) as a "contract by which one of the parties undertakes to do something for the other in consideration of a payment agreed upon between them."

The relations of master and workmen are thus legally defined as a contract, and failing further special legislation on the subject, both parties are of course compelled to fall back upon the general law relating to contracts, and are bound to seek within its provisions the rules which must govern their special relations. Free citizens of the Republic, they are supposed to meet and make their own arrangements upon a footing of equality, the obligation to carry out the terms of their contract being regulated by the ordinary law of the land. It is

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not considered necessary that this contract should be in writing or even be expressed in words; it is created by the simple fact of the engagement being accepted by the two parties when the conditions appertaining to the contract, whether tacit or expressed, "have the binding force of law upon those who have accepted them." Art. 1,134 of the Civil Code declares that the terms of contracts "must be executed in good faith," and Art. 1,135 requires the observance "not only of the conditions actually expressed, but of those which equity, custom or the law regard as the natural consequence of the contract." Art. 1,159 requires that doubtful or ambiguous conditions should be interpreted in accordance with the local custom of the district, and Art. 1,142 that "every obligation to perform or not to perform any legitimate act entails an action for damages against the party who has failed in his engagement."

The Code, again, is silent as to the special responsibility incurred by the master, as distinguished from that of other citizens of the Republic, in case of accident to the workman, and the latter has therefore to appeal to the general law for compensation for any injury he may have sustained. For years past, session after session, bills have been presented to the French Chamber or to the Senate with a view to establishing special legislation to regulate the employer's liability; but all such efforts have been in vain, as the general opinion of the nation hitherto has undoubtedly been that the interests of the workmen are sufficiently safeguarded by the general laws, applicable to all citizens alike.

Art. 1,383 of the Civil Code declares that every one is responsible for the damage he has caused to others, "not only by an act, but also which may have happened through his negligence, imprudence, or ignorance of what he ought to have known." And Art. 1,384 renders "any persons in authority—parents, teachers, masters and foremen—liable for any damage done by those supposed to be under their control."

From this it follows that the employer's responsibility in case of accident to the workmen is regarded by French law as being controlled first by his position as one of the parties to the labour contract as governed by the articles cited above, and, secondly, by the law which declares the responsibility of all for their own acts and of those in authority for the acts of others whom it is their function to direct and control.

Responsibility, however, is dependent upon power to control, and hence all employers of labour are not regarded as responsible for accidents to the workman, the co-partner in the abour contract, even when such accident is the direct result of the work which the latter has undertaken. This is thus expressed by M. D. Boulanger ("Louage d'Ouvrage," 1891):—"If I contract with a mason to build a wall, or with a slater to mend my roof, each of these men exercises his trade in his way, providing the tools and the materials necessary, and I have no right to direct the way in which the work is to be done. If, therefore, the mason falls from the wall, or the slater's rope breaks, the law can in no way hold me responsible for the result, since I had nothing whatever to do with the matter." But when the employer is a master (patron) the case is very different, for it was one of the terms of his contract that he should control and direct the work, and if the accident be due to his defective direction or insufficient surveillance, his liability is complete. It is so regarded also should it be due to the act of an incompetent or careless foreman, or of men whom he had engaged, just as it would have been had he supplied the injured man with a rotten rope or a broken ladder.

In tracing the general application of the French law as regards this subject, we must suppose the accident to have been due to the fault, negligence or ignorance of, first, the master; second, his foreman, or one of the men he had engaged; or, third, the victim himself. It may also have been due to absolutely unavoidable circumstances (*force majeure*); or, again, the causes may remain unknown. In the first of these cases there is, of course, no doubt as to the liability of the employer. Thus it has been decided that the master is liable for accidents resulting from the explosion of a steam-engine due to a defect in the machine (Lyons, June 3, 1869), or the fall of a scaffolding constructed with faulty materials (Paris, 1890). The application of the law, however, leads at times to somewhat unexpected results. Thus in a boiler explosion a wall and part of the roof were blown down and a workman was killed. The widow, who prosecuted the employer for damages, lost her case in the first instance and also on the first appeal, as it was proved that no fault was attributable to the master. The case was finally decided before the Court of Cassation (April 19, 1887) when it was proved that the engine, being incorporated in the building, was an integral part thereof in conformity with Arts. 524–25 of the Civil Code, and the proprietor of the building was consequently held responsible for the *vice de construction* which had caused the unfortunate man's death.

When the accident is due to the fault of the foreman or of a fellow workman, the victim or his representatives must take action primarily against the actual author of the accident, in virtue of Arts. 1,382 and 1,383, which render every man respon-

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sible for his own acts, and also against the master, who by Art. 1,384 is responsible for damage done by persons or things under his control. Should a fatal accident be followed by a prosecution for culpable homicide against the man by whose fault it was caused, and he be acquitted, the master may, nevertheless, be held civilly responsible in damages to the victim's family. (Cassation, May 16, 1887.) The master or overseer may even be held criminally responsible for the fault of others when the accident resulting from that fault was due to the instructions given by them. Thus it was decided on March 6, 1879, that both a contractor and his foreman were criminally responsible for the injury sustained by some of their workmen through a culpably imprudent act performed by others who were working under their supervision. It is, however, only in very exceptional cases that this criminal responsibility attaches to the master.

When the accident is proved to have been due to the imprudence or fault of the victim, the employer, of course, escapes all responsibility. Thus it was decided on February 6, 1889, that the master owed no compensation to the family of a workman who had been killed through his disregard of a danger of which he had been warned. To render the master liable, it is also necessary to prove that the accident happened to the man when actually performing the service for which he was engaged. A carter, who was instructed to convey some casks of wine to a customer of his master's, exceeded his instructions by assisting to place the casks in a cellar. Having been injured in so doing, it was decided at Lyons, December 10, 1869, that he had no claim for compensation, since this part of his work had been undertaken at his own risk. Nor, again, can the workman claim any compensation when the injuries he has sustained were the result of the inherent perils of a trade which he knew to be dangerous, and when no special fault increasing those dangers has been proved against the master. In cases where it is shown that the accident was due to wholly unavoidable circumstances, or where, again, the cause cannot be discovered, the employer is relieved of all responsibility.

The burden of proof of the master's liability to pay compensation always rests upon the injured workman or his representatives. In the opinion of those favourable to a change in the law, this burden of proof should be transferred to the master, who, they consider, should in all cases be regarded as responsible until he has proved the contrary. Thus the loss resulting to the workman from a fortuitous accident, or where the causes cannot be discovered, would generally fall upon the employer, instead of the workman himself, as under the existing law. Such a change, however, the French Legislature has hitherto regarded as supportable only on humanitarian grounds, the workman being the poorer man of the two, but wholly opposed to Art. 9 of the "Rights of Man," which declared that "every man must be presumed innocent" until his wrong-doing has been proved.

STRATFORD-ON-AVON CHURCH.

THE vicar of Stratford (Rev. G. Arbuthnot), having expressed a desire to construct in Holy Trinity Church a "people's altar," the structure to occupy a prominent position between the nave and the entrance to the chancel, a good deal of opposition has been shown to the proposal by the parishioners generally, who contend that a second altar in the church is unnecessary, and that the proposed erection would seriously mar the noble proportions of the church, and block the view of the fine chancel containing Shakespeare's monument. To ascertain the views of the parishioners, the churchwardens caused two memorials to be placed for signature in the Town Hall, one in favour of a "people's altar," and the other against it. At five o'clock on Saturday, when the lists closed, it was found that 250 persons, representing some of the leading parishioners, had signed against the project, while only one name had been recorded in its favour.

POOR STONE IS DEAR STONE.

A PROMINENT and practical stone-cutter writes to us, says the editor of the American journal *Stone*, in the following strain. Practical stone men will recognise its truth, and architects and contractors cannot too soon recognise the points taken, the truth of which many of them will testify by sad experience. He says:—

The stone industry is being menaced with many influences that are detrimental to it, in which are the cutting of prices, ruinous competition; but the principal cause, an inferior quality of rock, while it is really a primary cause of loss, is not generally recognised as such. The rock being used in the buildings in towns and cities at the present time is very inferior compared to that used a few years ago. In using this rock our contractors are encouraging the growth of an illegitimate dickering in quarry land speculation, with no advantage to themselves, but



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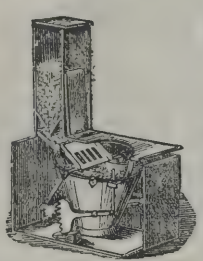
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rather a present loss, with a still greater loss in the future. There are many unknown quantities that are deceptive in the cut-stone business. It cannot be taught as readily as many other kinds of business, unless the contractor observes closely and carefully, and estimates each item of expense in the varied processes through which the stone must go before it reaches its place in the building. Without it he will not know to what cause the shrinkage of his profits is due. Most stone bosses will let a good stone-cutter go, and keep one who will do a dollar's-worth less work in a day simply because he will work for 25 cents less in wages. This evidently would mean a loss of 75 cents per day caused by lack of knowledge; but in no part of the work is this so noticeable as in the use of a poor quality of stone for good work. The difference in this cost of working good and bad rock is so great that in good, clean or moulded work a man could pay the market price for first-class rock and compete, on more than equal terms, with a man who had poor rock given him free of charge. If any employer will take the trouble to test this by timing a practical stone-cutter on a few pieces of work of good and poor quality of rock, and then estimate the cost of each, including the cost of stone and labour, he will find the poor quality of stone will be discounted. Every practical stone-cutter knows this. A good cutter has a regular system of working. He works large drave bats, and in regular succession, and by this means there is not a particle of labour lost. But when this cutter is put on stone that is full of flint or other hard substances it throws him out of his system of working. The corner of the drave dips in at times, and makes it necessary for the cutter to go over a considerable space the second time. Besides these things, he breaks teeth out of the tooth draves, and a continual succession of accidents and irregularities occur. The same is true in rock that is not uniform in hardness. Then again the poor quality of stone is full of defects, such as seams, pockets or large nodules, which often result in the stone being condemned, or it must be patched with shellac, and this is total loss; the latter takes time, and hence increases the expense of cutting, which alone in good work, out of rough stock, will average more than twice the original cost of the stone. The cutter will cut from a fourth to a half more in good rock than in poor. But this is not all. The saw will cut from a fourth to double as much more in good clean rock than in poor rock, and do it much better, as when the blade of a saw strikes a patch of flint or any hard substance it is thrown out of its regular course, and the result is a crooked surface. Here again is extra expense. The rubbing is also expensive for the same reason. There is still another matter of much importance in this connection. I refer to the fact that the work when done is not, when made of this second or third grade rock, as good, either in appearance or durability, and no contractor can long use a poor quality of rock in good work without ruining his reputation both with architects and the public. Besides, it will make that particular stone product unpopular. The fact that permanency in business is a valuable consideration must also be counted in this connection. Any employer who will investigate for himself will find that it will not pay to purchase poor rock at any price.

THE RIBBLE NAVIGATION WORKS.

THE Parliamentary Committee of the Preston Corporation and the Ribble Committee have both decided unanimously, after careful consideration of the report of the Ribble Navigation Commission, recently published, that it is not advisable to apply to Parliament at present for further powers; and that it would be better to watch the result of the north training wall and the extent of trade development during the ensuing year. It is stated that there is sufficient money in hand to complete the dredging down to a depth of 5 feet below the level of 1883, to erect the north wall, and to complete the dock contract and its equipment, thus completing the works as far as Lytham.

THE MANCHESTER SHIP CANAL.

WITH the completion of a second section of the Ship Canal the shareholders of the company may look forward, says the *Manchester Guardian*, with some confidence to the days of profit-earning. Before the end of the present month the salt boats of the Weaver Navigation will depend no longer on Mersey tides, but will sail securely into the canal at Weston Point, and pass through the gates at Eastham into the deep navigable channel of the river, and so to their port of destination. On this traffic, or on a considerable portion of it, tolls will be levied, which will pass into the exchequer of the company. Since the Eastham section was opened two or three months ago the attention of the engineers has in a large measure been centred on the adjoining Ince section. This length covers a distance of 7 miles, and, owing to the soft, marshy character of much of the soil through which it passes,

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GOLD MEDAL, PARIS EXHIBITION, 1889.

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[ED. C. DE SEGUNDO, M.Inst.C.E., *Executive Engineer.*] CAPITAL, £20,000. [CH. F. JONES, *Secretary.*]
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it has been necessary to pay close attention to the pitching of the banks. The work was declared finished on Saturday, and to all outward appearance it is a most solid and satisfactory performance. On Monday the letting in of the waters began, a depth of over two feet being registered towards the close of the afternoon. There was none of the excitement which attended the completion of the Eastham section. On that occasion the engineers just failed in accomplishing one of the very big feats to which they have accustomed us in the making of the Ship Canal. They sought to close a large gap in the estuary wall during the retreat of a single tide, and being for the moment beaten the country rang with the news. Of course the position was very soon retrieved, but before the *Rocket* made the first passage over the length of the section an embarrassing publicity was given to the operations which were being carried on. There was no anxiety on any such score on Monday morning. In the presence simply of a few workmen, Mr. Jones, the agent of the section, lifted a sluice (much after the fashion of turning a tap), and then through a huge pipe the water poured from the full Eastham section into the empty Ince section. The proceeding was of the simplest character. Between the two sections there is a neck of land 8 or 10 yards in width. Piercing the soil is a pipe 90 feet long and 4 feet in diameter, one end of it being in the Eastham waters and the other emerging some 10 to 12 feet above the bed of the Ince portion. By means of the sluice the quantity of water entering from the Eastham side of the dam can be nicely regulated. Mr. Jones lifted the sluice just so high as to admit half the flow of water which the pipe would carry. Out at the Ince end it hurried in a fine stream into a wooden trough, which carried it without much violence into the bed of the canal. In three and a half hours a depth of 18 inches was measured, and at four o'clock in the afternoon the depth was 2 feet. For some days to come the water will flow in at very much this rate until the requisite 26 feet is reached. By that time of course the Ince end of the pipe will be under water to the extent of some feet. To complete the explanation with regard to the letting in of the water, it is necessary to state that the filling is not to be altogether accomplished by means of the pipe. The Ince section is not less than seven miles in length, and, in order to facilitate the flooding process two temporary dams, each 8 feet in height, were so placed as to cut the bed into three fairly equal parts. One of the dams is at Ince and the other at Holpool Gutter. Until the water reaches the 8-feet level only the first of the three parts is served by the pipe. In the second portion, by discontinuing the use of the pumps and giving play to the natural drainage, a depth of 6 feet was reached on Tuesday morning. In the third portion, from Holpool Gutter to the dam at the mouth of the Weaver, there is now in the same way 8 feet of water. When in the three parts the water reaches a uniform level of 8 feet, and the dams are covered, the canal will rise equally till the water in the two sections forms a perfect plane.

Further operations will be entered upon at the end of the present week, and these, it is expected, will be completed before the 29th inst. The object in view is to connect the Weaver Canal with the Ship Canal. The point of connection is at Weston Marsh, and the method of it is the fine system of locks which have here been built. Between the locks and the canal there is the channel of the Weaver, which the dredgers are making deep—a work which is practically finished. Between the channel, again, and the canal there is a dam or neck of land some 8 or 10 yards wide. When the water in the canal is at the full depth of 26 feet, the dredgers now in the Weaver channel will cut the dam away. This done, they will pass down the canal to Ellesmere Port and assist in clearing the neck of land which divides the Ince and Eastham sections. There will be then a clear stretch of water from the gates at Eastham straight to the locks at Weston Marsh, and 11 miles, or about one-third of the length of the canal, will be open for traffic. The most difficult part of the whole task of the canal engineers will then have been accomplished. The point marked "A" on the Parliamentary plans will have been reached, and the company will be at liberty to make all possible progress—a thing they are yet expressly debarred from—on the adjoining Runcorn section. On the virtual accomplishment of this important portion of the undertaking the engineers of the company deserve warm congratulation. Apart from the great engineering features of the canal, such as the locks at Eastham and the sluices at the mouth of the Weaver—a remarkable monument in masonry—they have had to meet and overcome many grave difficulties. A very considerable portion of the canal is built on land snatched from the sea. In the absence of the tides a deep foundation of piling has had to be laid on which to construct sea walls. The inland portions also have in places given the engineers no small amount of anxiety. It may be interesting to indicate the character of the troubles which faced the workers on the Ince section. From Ellesmere Port to the river Gowy (which passes in a syphon deep under the canal to discharge itself into the

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ESTIMATES, PRICE LISTS, CATALOGUES, &c.

Mersey), there was a tolerably easy cutting through hard clay. From this point to Ince, however, the soil consists of soft marsh clay and peat, and it was necessary continuously to guard against the occurrence of slips. For a long distance after this point a clean cutting had to be made through the hard red rock, and as the surface was hilly there is a straight wall at one point not less than 70 feet high. After the rock there was more marsh clay to contend with, and finally a long stretch of shifting sand. As a consequence of having to deal with soil of this sort, the slopes of the Ince section have had to be made very flat, being in the worst places only 1 foot vertical to 4 feet horizontal. In its completed state nothing could look more substantial than this section. There has been no niggardliness in the use of masonry and in some places of brick. As an extra strengthening fascine work, such as we see in the canals of the Low Countries, has been introduced. The strong cording of willows in the banks is quite a feature of this portion of the work, and in summers to come their greenness will pleasantly break the monotony of stone walls.

The 29th inst. is provisionally fixed for the passage of the first boats from the Weaver Navigation to the Ship Canal.

IMPERIAL VILLA, CORFU.

THE correspondent of the *Daily News* in Vienna says that the Empress of Austria's villa on the island of Corfu is now completed, and the artists and artisans who return from having helped to finish it are full of praises of the fine house and the lovely spot upon which it has been built. The property extends over twenty-three acres, which were planted with olives and cypress trees immediately after the place was purchased, and long before the Empress began to build her house. The property is situated in an olive-crowned valley called Casturi, twenty minutes' drive from Corfu, and the villa rises on a hill commanding a splendid view of the sea. The house is a three-storeyed palace in the purely Greek style, with a fine Pompeian portico, which is entirely built out of pink marble. There are thirty rooms, adorned with frescoes by Italian artists, the subjects being almost all taken from mythology. The wood used is old walnut, and the tapestries and carpets are fine specimens collected by the Empress during her voyages in the Mediterranean ports. There are numerous bronze and marble statues both in the house and around it, on the terrace and in the gardens.

YOKOHAMA HARBOUR WORKS.

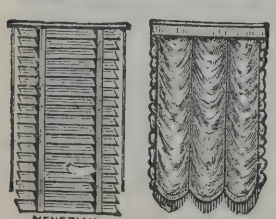
THE accompanying advertisement respecting the supply of material for a new pier at Yokohama has been received at the Foreign Office. The specifications, &c., mentioned in the advertisement may be seen at the Commercial Department of the Foreign Office between the hours of 11 and 5 :—"Yokohama Harbour Works.—Tenders will be received at this office between 9 A.M. and 11 A.M. on December 4 next for the supply of some 3,600 tons of iron screw piles and shoes, with other materials and accessories, for an iron pier for the Yokohama Harbour Works. Persons desiring to tender may obtain copies of the specification and forms of tender and agreement on application at the Kanagawa Kencho. The specification also gives the particulars to be observed in tendering. The security-money which has to be deposited with each tender, at the time of tendering, is 11,310 yen. The tenders will be opened at the Kencho at 11.30 A.M. on December 4 next. The contract on the part of the Kanagawa Kencho will be entered into by Mr. Nobukata Mitsuhashi, counsellor of the Ken, and chief commissioner of the Yokohama Harbour Works. Kanagawa Kencho, Yokohama, August 4, 1891."

THE ST. CLAIR TUNNEL.

THE chairman of the Grand Trunk Railway, Sir Henry Tyler, who has been making a tour of inspection over the company's many lines, is about to complete his official duties in Canada by formally opening the St. Clair Tunnel. This tunnel forms a land connection between the Canadian lines and the American lines under the same management running to Chicago. Hitherto the trains have been carried over the St. Clair river—the outlet of Lake Huron—on huge ferry-boats, which were liable to be delayed by ice in winter, as well as to the ever-present risk of crossing a rapid stream. The tunnel not only abolishes these risks, but makes the time of transit very much shorter, and a simultaneous alteration in the routes of approach to the river has reduced the length of the line by six miles. The tunnel is 6,026 feet long, or 11,553 feet including its excavated approaches. The boring of the tunnel proper was done by means of large and heavy wrought-iron shields with sharp cutting edges, each shield being driven forward by hydraulic rams of enormous power. From the time when the shields were lowered into

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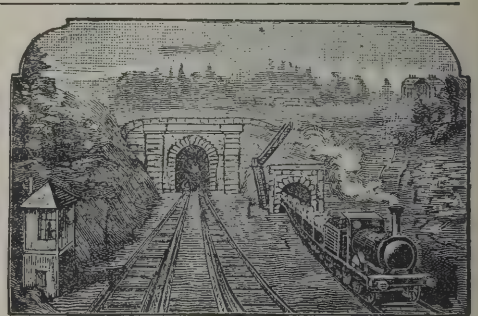



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position at the two proposed entrances till they met in the middle the work occupied just a year. The tunnel is 20 feet in diameter, and is lined throughout with cast-iron plates 2 inches in thickness. Over 880 tons of bolts and nuts were used in constructing the lining, which weighs altogether 28,000 tons. The road bed under the river is practically level, but the gradient of the approaches is 1 in 50. Arrangements have been made for electric lighting all through the tunnel and for thorough ventilation. The cost of the tunnel proper is given as 292,000*l.* Four large locomotives have been provided for use at and in the tunnel, weighing 42½ tons apiece.

REGISTRATION OF PLUMBERS.

THE second examination of plumbers in connection with the above movement was held in Southampton on Saturday, Sept. 12, when fourteen candidates presented themselves. The written examination was held at the Hartley Institution, and the practical part of the test was conducted in Mr. Brazier's workshops in Canal Walk. Nine of the candidates succeeded in satisfying the examiners, the remaining five failed. Those successful were Messrs. G. Seal, C. Lovejoy, J. Cosser, G. Ridyard, J. Biles and G. Hinwood, all of Southampton; A. Marshall, Bournemouth; W. Brazier and J. Lilley, Christchurch.

ARTESIAN WELLS FOR DESERT RECLAMATION.

THE most remarkable example of reclamation by means of artesian well water, says United States Irrigation Commissioner Hinton, in an official report, is found in the desert provinces or departments of Algeria under the French rule. The area, officially given, of French Algeria, is 184,465 square miles. The outlying portion is put at 135,000 square miles. In this total of over 329,415 square miles one-half belongs to the Sahara, or desert. The European population in 1887 was about 250,000; the natives and naturalised were 3,328,549, making a total of 3,578,549. Cultivation by means of flowing well waters has been sedulously fostered by the French colonial government for both political and economic reasons. Such wells as a means of reclamation began systematically to be bored in 1857, the French engineer, M. Jus, having demonstrated in 1856 that the desert was endowed with large supplies of underground water. The total number of wells that have been bored since that date in the departments of Algiers, Oran and Constantine, is stated at 13,135. These wells range from 75 to 400 feet in depth, and the low pressure common to the majority of them forces the water to a distance of about 2 feet above the ground. The waters are then collected in small ditches, which convey them to the vineyards, date-trees and fields of durra, millet, wheat, &c., which comprise the chief products. In all, about 12,000,000 acres have been reclaimed in this way. The Government bores are at least one-tenth of the whole number.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

14665. Albert Brigg, for "An improved method of excluding the draught through windows."

14731. Thomas Bentley, for "Improvements in radiators for warming and heating buildings."

14747. John Britten, for "Improvements in self-feeding boilers for domestic and other similar purposes."

14750. John Henry Lord, for "Improvements in racks for window blinds."

14751. Thomas Jenner, for "Improvements in hinges."

14781. Joseph Jasper Crane, for "An improved metal fence post."

14820. Charles James Henderson, for "Warming, ventilating and lighting apparatus."

14845. Gustave Jetley, for "Jetley's patent festoon blind action."

14867. Bartholomew Binnington, for "Improvements for the better roofing of buildings."

14966. John Harrop Jones, for "Improvements in or applicable to sash fasteners."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CASSELL, Patent Agents, 37 Chancery Lane, London, W.C.

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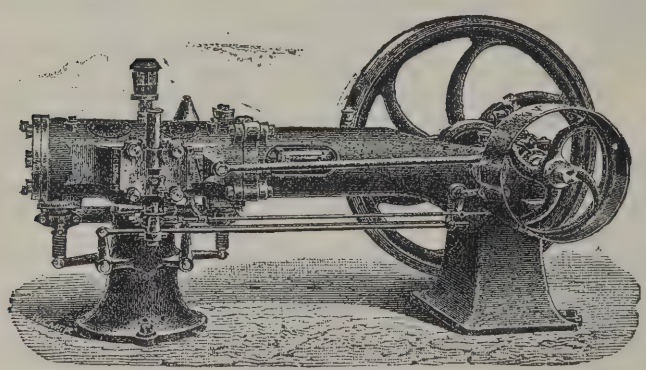
THE

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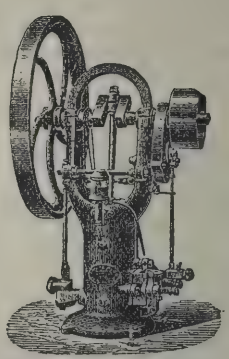
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Friday, September 18, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, SEPTEMBER 25, 1891.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

BATH.—Oct. 31.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

EASTLEIGH.—Sept. 28.—Plans are required for Sewerage and Sewage Disposal. Mr. Joseph Robins, Clerk to the South Stoneham Rural Sanitary Authority, 19 and 20 Portland Street, Southampton.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

SHREWSBURY.—Sept. 30.—Designs, &c., are invited for Building Police Station, Constable's House, &c. Mr. W. C. Eddowes, Borough Surveyor, The Square, Shrewsbury.

SOUTH STONEHAM.—Sept. 28.—Designs, &c., are invited for Sewerage and Disposal of Sewage. Mr. Joseph Robins, 19 and 20 Portland Street, Southampton.

CONTRACTS OPEN.

ABERDEEN.—Sept. 30.—For Building Powis Church. Messrs. Matthews & Mackenzie, Architects, 255 Union Street, Aberdeen.

ALNWICK.—Oct. 5.—For Constructing Drying Closet at the Laundry, Alnwick Union Workhouse. Mr. F. R. Wilson, Architect, Alnwick.

AMBLE.—Oct. 7.—For Building Premises for the Amble Co-operative Society. Mr. George Reavell, jun., Architect, Alnwick.

ANNAN.—For Supply of Road Metal. Mr. A. B. Smith, Road Surveyor, Annan, Dumfries.

ASHFORD.—Oct. 8.—For Supply of Sixty Horse-power Steam Boiler. Mr. C. D. Hume, District School, Ashford, near Staines.

BARNET.—Sept. 30.—For Making-up Park Road and Laying Pipe Sewer. Mr. W. H. Mansbridge, Surveyor, 140 High Street, Barnet.

BELFAST.—Sept. 28.—For Constructing High-Level Sewer and Works in Connection. City Surveyor, Town Hall, Belfast.

BELFAST.—Oct. 1.—For Extension of Running Shed. Mr. J. Milliken, Secretary, Belfast and County Down Railway Co., Belfast.

BELFAST.—Oct. 5.—For Supply of Setts. Mr. T. R. Salmond, Engineer, Harbour Office, Belfast.

BEN RHYDDING.—Sept. 28.—For Building Two Houses. Mr. J. W. C. Atkinson, Architect, 1 Ivegate, Bradford.

BIDEFORD.—Oct. 1.—For Building Bank Premises. Mr. Arnold Thorne, Architect, Broad Quay, Bideford.

BLACKPOOL.—Sept. 30.—For Materials and Building Promenade Pier. Mr. Thos. P. Worthington, Engineer, South Shore, Blackpool.

BLACKWALL.—Oct. 12.—For Constructing (by Compressed Air) and Maintaining Carriageway and Footway Tunnel under the River Thames. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

BRISTOL.—Oct. 16.—For Extension of Avonmouth Dock. Mr. John M. McCurrick, Docks Engineer, Cumberland Basin, Bristol.

BROMLEY.—Oct. 1.—For Paving, Kerbing, Channelling, &c. Mr. R. G. Mullen, Local Offices, Bromley, Kent.

BURNLEY.—Oct. 13.—For Supply, Delivery and Erection of Sixty Tons of Cast-iron Girders. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

CARDIFF.—Sept. 30.—For Alterations and Additions to Free Library. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

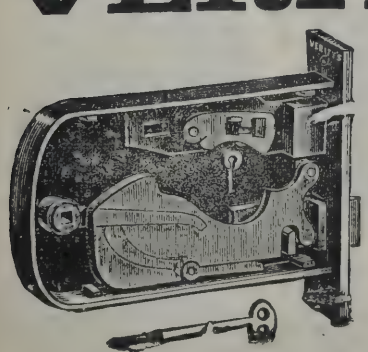
CARLISLE.—Oct. 1.—For Building Public Library, Museum, School of Art, &c. Mr. W. Howard Smith, City Surveyor, 36 Fisher Street, Carlisle.

CHORLEY.—Sept. 28.—For Supply of Gas Mains. Mr. Wm. Blackledge, Gas Manager, Chorley, Lancashire.

CHURCH STRETTON.—Sept. 30.—For Building Infirmary. Mr. A. B. Deakin, Architect, Castle Chambers, Castle Street, Shrewsbury.

CLAPTON.—Oct. 5.—For Iron Staircase at Workhouse. Mr. F. W. Crane, 61 Bartholomew Close, E.C.

VERITY BROS. CALL LANE, LEEDS.



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ROLLING BOLT, MORTICE & RIM LOCKS, NIGHT LATCHES, &c.

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CATALOGUES FREE BY POST.

COLNE.—Oct. 6.—For Supplying and Fixing Heating Apparatus. Mr. John Mallinson, Architect, Colne Lane, Colne.

CORK.—Oct. 5.—For Building Memorial Ward at Infirmary. Mr. Arthur Hill, Architect, 22 George's Street, Cork.

COVENTRY.—Oct. 2.—For Building Premises. Mr. H. W. Chattaway, Architect, Coventry.

CWMTAFF.—Sept. 28.—For Building Dwelling-house. Mr. E. Lumley, Architect, 24 Castle Street, Merthyr Tydfil.

CYMMER.—Oct. 1.—For Building Chancel and Vestry to Cymmer Church. Messrs. Halliday & Anderson, Architects, 16 High Street, Cardiff.

DARENTH.—Sept. 25.—For Erecting Brick Building. Mr. T. Duncombe Mann, Metropolitan Asylums Board, Norfolk House, Norfolk Street, Strand, W.C.

DEVONPORT.—Sept. 28.—For Alterations, &c., to Landing Stage, and for Wood Paving. Mr. J. F. Burns, Borough Surveyor, 30 Ker Street, Devonport.

DOWNPATRICK.—Oct. 31.—For Constructing Waterworks. Mr. J. W. Montgomery, Union Offices, Downpatrick.

DEVIZES.—Oct. 1.—For Erecting Precipitation Tank at Sewerage Outfall. Mr. C. A. Lailey, Engineer, 16 Great George Street, Westminster, S.W.

DUNSFORD.—Sept. 28.—For Building House, Poole Farm. Mr. E. Ellis, C.E., Bedford Circus, Exeter.

DURBAN.—Oct. 2.—For Supply and Delivery of Steel Tram Rails. Mr. W. H. Radford, C.E., Angel Row, Nottingham.

EASTBOURNE.—Oct. 13.—For Supplying Westminster Chiming Clock for the Town Hall. Borough Surveyor, Town Hall, Eastbourne.

EASTBOURNE.—Oct. 19.—For Constructing Sewers. Borough Surveyor, Town Hall, Eastbourne.

ELY.—Sept. 28.—For Supply of Broken Granite. Mr. William McKelvie, City Surveyor's Office, Ely.

FELLING.—Oct. 7.—For Building Mechanics' Institute. Mr. H. Miller, Local Board Offices, Felling, near Newcastle.

FENNY STRATFORD.—Sept. 29.—For Supply of Cast-iron Pipes, Valves and Hydrants, and Laying Water-mains. Mr. G. W. Branson, Surveyor, Committee Room, Bull Hotel, Fenny Stratford.

FERNDALE.—Sept. 26.—For Building Chapel. Mr. W. Jones, Surveyor, 56 Fountain Street, Ferndale.

FOLESHILL.—Oct. 1.—For Building Five Houses. Mr. T. F. Tickner, Architect, 7 Bishop Street, Coventry.

GLASGOW.—Sept. 26.—For Supply of Cast-iron Pipes.

GRIMSBY.—Oct. 6.—For Building Workhouse. Mr. H. C. Scaping, Architect, Victoria Chambers, Grimsby.

HALIFAX.—Oct. 9.—For Building Fire Brigade Station. Mr. James Farrar, Architect, Crossley's Buildings, Northgate, Halifax.

HAMPSTEAD HEATH.—Sept. 29.—For Erecting Public Conveniences. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

HATCHAM.—Sept. 25.—For Building Church and Vicarage. Mr. Henry Stock, 9 Denman Street, London Bridge, S.E.

HAVERSTOCK HILL.—Sept. 28.—For Extension of Laundry Buildings. Mr. T. Duncombe Mann, Metropolitan Asylums Board, Norfolk House, Norfolk Street, Strand, W.C.

HERNE HILL.—Sept. 29.—For Additions, Alterations and Repairs at Brockwell Park. Architect of the London County Council, Spring Gardens, S.W.

HERNE HILL.—Oct. 5.—For Supplying and Erecting Cleft Oak Fencing at Brockwell Park, Architect of the London County Council, Spring Gardens, S.W.

HERTFORD.—Oct. 8.—For Repairing Roads. Mr. T. R. Dickinson, Borough Surveyor, Hertford.

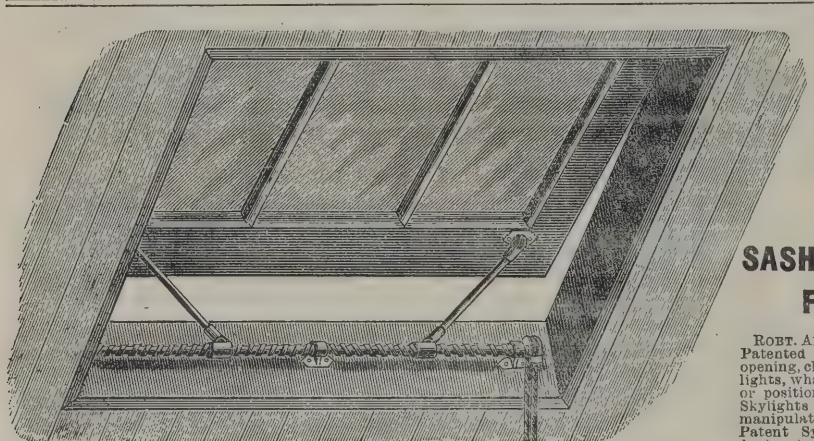
HOVE.—Oct. 26.—For Electric Llighting. Mr. Charles A. Woolley, Town Clerk, Town Hall, Hove.

KEIGHLEY.—Sept. 30.—For Constructing Sewers. Mr. W. H. Hopkinson, Borough Surveyor, Municipal Buildings, Keighley.

KIRKHAM.—Sept. 30.—For Constructing Brick and Concrete Conduit. Mr. E. Garlick, Engineer, 33 Winckley Square, Preston.

LEAMINGTON.—Oct. 12.—For Supply of Broken Granite. Mr. H. C. Passman, Town Clerk, Leamington.

LONDON.—Sept. 26.—For Building Boundary Wall at the Workhouse, Islington. Mr. William Smith, Architect, 65 Chancery Lane, W.C.

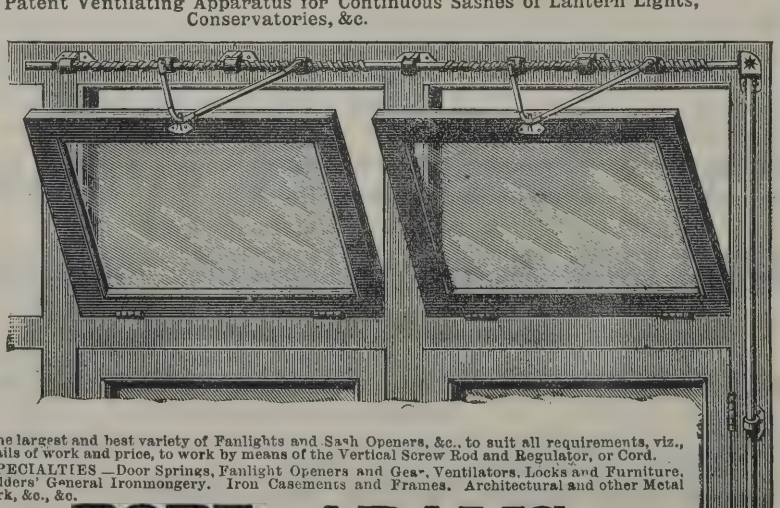


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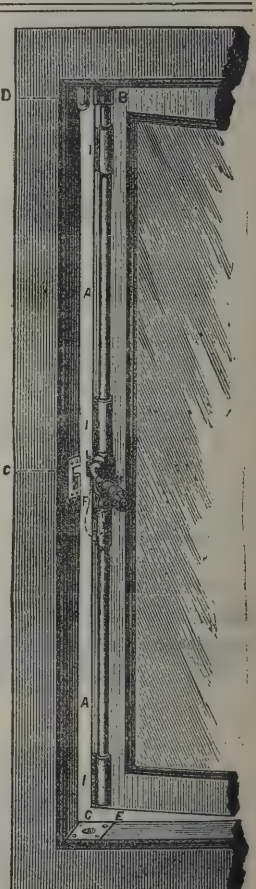




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SPECIALTIES.—Door Springs, Fanlight Openers and Gear, Ventilators, Locks and Furniture, Builders' General Ironmongery. Iron Casements and Frames. Architectural and other Metal Work, &c., &c.

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LONDON.—Sept. 29.—For Constructing Pumping Station at Pimlico. Engineer's Department, County Hall, Spring Gardens, S.W.

LONDON.—Oct. 5.—For Supply of Bricks, Cement, Stone, Fencing, Engine and Carriage Springs, &c., Great Western Railway. Mr. J. D. Higgins, Paddington Station, W.

LONDON.—Oct. 5.—For Supply of Gravel, &c., to Victoria Park and Battersea Park. Architect of the London County Council, Spring Gardens, S.W.

MILE END.—Oct. 15.—For Erecting Iron Balconies, Stairs, &c. Mr. Charles F. Burden, Mile End Workhouse, Bancroft Road, E.

MORLEY.—Sept. 28.—For Building House and Shop. Mr. T. A. Buttery, Architect, Queen Street, Morley, near Leeds.

NEWTON-LE-WILLOWS.—Oct. 17.—For Building Public Hall and Offices. Mr. Thomas Beesley, Architect, Bold Street, Warrington.

NORTH WOOLWICH.—Sept. 29.—For Rebuilding River Wall, and Supplying and Fixing Wrought-iron Fencing. Architect of the London County Council, Spring Gardens, S.W.

NORWOOD.—Sept. 30.—For Extension of Infirmary. Mr. S. R. J. Smith, Architect, 15 York Buildings, John Street, Adelphi, W.C.

OVENDEN.—Sept. 28.—For Building Stable and Harness-room. Messrs. Petty & Ives, Architects, Waterhouse Street, Halifax.

PENANG.—Sept. 29.—For Supply of Cast-iron Pipes. Mr. C. C. Lindsay, 167 St. Vincent Street, Glasgow.

PENICUIK.—Sept. 30.—For Sinking Coal Pit. Mr. J. Love, Eastfield, Penicuik.

PENTRE RHONDDA.—Sept. 30.—For Constructing Sewer, Paving, Kerbing, Channelling. Mr. J. W. Jones, Surveyor, Local Board Offices, Pentre Rhondda.

PLYMOUTH.—Sept. 25.—For Alterations and Additions to Theatre Royal. Mr. J. D. Bellamy, Surveyor, Municipal Buildings, Plymouth.

POPLAR.—Sept. 30.—For Supply of Gas-cooking Apparatus. Mr. G. H. Tough, Clerk to the Guardians, High Street, Poplar, E.

PORTSMOUTH.—Sept. 30.—For Building Floating Bridge. Mr. W. F. Burrell, Portsmouth Floating Bridge Co., Gosport.

RAMSGATE.—Oct. 21.—For Constructing Sloping Road, Brick and Concrete Arches, Sea Wall and New Military Road. Mr. William A. Valon, Engineer, Hardres Street, Ramsgate.

RISCA.—Sept. 30.—For Erection of Police Buildings. Mr. W. Tanner, County Surveyor, County Council Offices, Newport, Mon.

ROCHDALE.—Sept. 30.—For Supplying Kerbs and Setts. Borough Surveyor, Town Hall, Rochdale.

ROCHESTER.—Oct. 14.—For Supply of Cast-iron Pipes. Mr. Richard Prall, Town Clerk, Eastgate, Rochester.

ROMFORD.—Oct. 3.—For Supply of Broken Granite. Mr. A. H. Hunt, Local Board Offices, Romford.

ROTHERHITHE.—Oct. 5.—For Building Two Rooms and Bathrooms at South Wharf, for the Metropolitan Asylums Board. Mr. Charles Thomson, South Wharf, Rotherhithe.

ROTHES.—Oct. 2.—For Laying Pipes with Concrete Cisterns. Mr. J. Smith, 10 Seafield Square, Rothes.

SALISBURY.—Sept. 26.—For Building Cottage. Mr. J. C. Bothams, Surveyor, Municipal Offices, Endless Street, Salisbury.

SANDWICH.—Sept. 30.—For Sinking a Well. Mr. A. J. Cast, Surveyor, St. Peter's Street, Sandwich.

SEDBURGH.—Sept. 25.—For Building Dwelling-houses. Mr. Stephen Shaw, Architect, 45 Highgate, Kendal.

SHEFFIELD.—Oct. 2.—For Constructing Pipe-Sewer and Storm-water Overflow. Mr. G. Halsing, Engineer, 81 Norfolk Street, Sheffield.

SHIPLEY.—Sept. 28.—For Constructing Lattice Girder Bridge. Messrs. W. B. Woodhead & Son, Civil Engineers, 18 Exchange, Bradford.

STOCKPORT.—Sept. 30.—For Building Stone Church. Messrs. Paley, Austin & Paley, Architects, Lancaster.

SWANSEA.—Oct. 5.—For Constructing Pipe-sewer. Borough Engineer, Guildhall, Swansea.

TAUNTON.—Oct. 5.—For Supply and Erection of Electrical Fire Calls. Waterworks Manager, Municipal Buildings, Taunton.

WALTHAMSTOW.—Sept. 25.—For Supply of Broken Granite. Surveyor to the Local Board, Town Hall, Walthamstow.

WEST HARTLEPOOL.—Sept. 29.—For Constructing Streets. Mr. J. W. Brown, Borough Surveyor, West Hartlepool.

Awards—Gold Medal, Saltaire, 1887; Silver Medal, Brussels, 1888; Silver Medal, Paris, 1889; Gold Medal, Brighton, 1889.

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A visit to our Show Rooms will be esteemed a favour. If inconvenient to call, send for one of our Illustrated Catalogues, inspect our Designs, and read our Testimonials.

Trusting to receive your favours, which shall have our prompt attention,

We remain, Gentlemen, yours obediently, **J. H. PICKUP & CO.**

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

Price, £1 10s. and upwards. Portable Filters on this System, £1 5s. to £3.

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Portable Cistern Filters.



157 STRAND, W.C. (Four Doors from Somerset House), LONDON.

WESTHAUGH.—For Building Iron and Stone Bridges. Mr. H. Lake, Road Surveyor, Claremont, Alloa.

WILTON.—Oct. 6.—For Supply of Gravel and Stones for Repair of Roads. Mr. G. M. Wilson, 12 Bridge Street, Salisbury.

WINDSOR. — Oct. 1. — For Timber Campshedding. Mr. G. H. Long, Town Clerk, Windsor.

WOOLWICH.—Sept. 29.—For Rebuilding River Wall. The Architect to the County Council, Spring Gardens, S.W.

WOOLWICH.—Sept. 30.—For Renewing Wood Floors of Barrack Rooms. Lieut.-Colonel A. C. Ward, Royal Engineer Office, Woolwich.

YORK.—Sept. 29.—For Constructing Brick Culverts. Mr. A. Creer, Surveyor, Guildhall, York.

TENDERS.

ALFORD.

For Pulling-down and Rebuilding Premises in South Street.

Wood	£449 0 0
Hasnip	429 0 0
Reed	428 0 0

BANBURY.

For Alterations to the Municipal Buildings.

Page	£2,725 0 0
Hobley	2,470 0 0
Claridge & Bloxham	2,400 0 0
Kingerlee	2,267 0 0
Timberley	2,315 0 0
Orchard & Son, Grimsbury	2,243 0 0

BOURNEMOUTH.

For Works on Several Roads, for the Town Council.

Fitzharris Road.

Tawse	£313 19 1
Troke	334 17 3
T. T. & W. Budden	320 19 0
Pike	289 12 7
Saunders & Co.	275 18 11

BOURNEMOUTH—*continued.*

Malmesbury Park Road.

Tawse	£483 0 8
Troke	430 8 10
T. T. & W. Budden	429 12 6
Pike	388 0 10
Saunders & Co.	376 6 5

Malmesbury Gardens.

Tawse	259 16 2
Troke	225 15 0
T. T. & W. Budden	219 0 6
Pike	205 7 5
Saunders & Co.	191 11 1

Firs Home Road.

Tawse	65 8 3
T. T. & W. Budden	59 19 6
Troke	57 3 2
Pike	54 16 6
Saunders & Co.	47 19 5

Total.

Tawse	1,122 4 2
Troke	1,048 4 3
T. T. & W. Budden	1,029 11 6
Pike	937 7 4
SAUNDERS & CO. (*accepted*)	891 15 10

BIRMINGHAM.

For Enlargement of the Municipal School of Art.

BOWEN (*accepted*)	£11,697 0 0

For Heating.

HOPE (*accepted*)	1,367 0 0

CROYDON.

For Erection of Master's House at Sydenham Road Board Schools and Additions at Mitcham Road Schools. Mr. R. RIDGE, Architect.

Mitcham Road.

Bulled & Co., Croydon	£399 0 0
J. & C. Bowyer, Upper Norwood	389 0 0
Smith & Sons, South Norwood	335 0 0
Taylor, Croydon	332 0 0
Akers & Co., South Norwood	329 0 0
Smith, Croydon	325 0 0
Bryan & Son, South Norwood	325 0 0
BACON, Croydon (*accepted*)	297 0 0
Bullock, Croydon	269 0 0

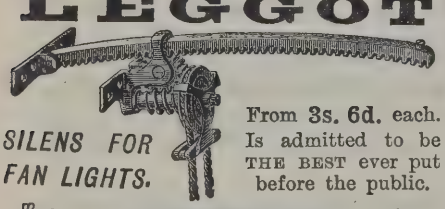
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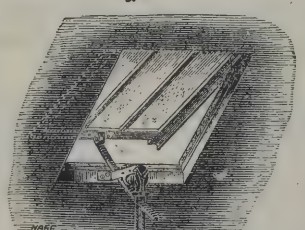
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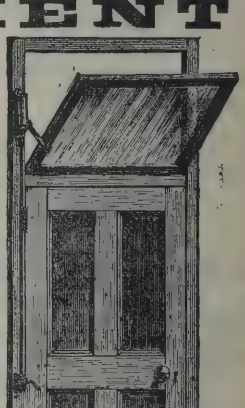
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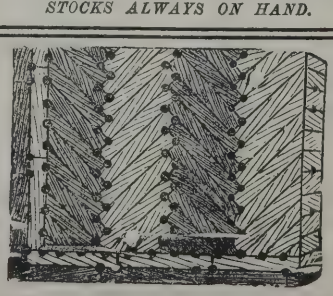
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CROYDON—*continued.*
Sydenham Road.

J. & C. Bowyer, Upper Norwood	£864 0 0
Akers & Co., South Norwood	793 0 0
Smith & Sons, South Norwood	768 10 0
Smith, Croydon	735 0 0
Bryan & Son, South Norwood	735 0 0
Taylor, Croydon	720 0 0
Bacon, Croydon	719 0 0
Bulled & Co., Croydon	619 0 0
BULLOCK, Croydon (*accepted*)	570 0 0

DARTFORD.

For Two Lancashire Steam Boilers, a Ten Horse-power Engine and Other Works, at the Gore Farm Hospital, Dartford, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

	Gross.	Deduct Old Materials.
J. Thompson	£1,500 0 0	£150 0 0
E. A. & H. Sandford	1,450 0 0	32 0 0
Benham & Son	1,425 0 0	70 0 0
Clements, Jeakes & Co.	1,375 0 0	50 0 0
J. & F. May	1,250 0 0	25 0 0
Hickie, Borman & Co.	1,129 10 0	40 0 0
Fraser & Fraser	1,227 0 0	35 0 0
J. Fraser & Son	996 0 0	85 0 0
WOODHOUSE & RAWSON, LIM., Staffordshire (*accepted*)	950 0 0	100 0 0

DUKINFIELD.

For Taking Down and Rebuilding the Wheatsheaf Inn and Four Cottages, Birch Lane. Messrs. JOHN EATON & SONS, Architects, Ashton-under-Lyne.

J. W. WILLIAMSON, Ashton-under-Lyne (*accepted*)	£1,330 0 0

EASTBOURNE.

For Supplying and Erecting Hot-water Apparatus at the Workhouse Infirmary.

Baker, Brighton	£370 0 0
Knight, Eastbourne	295 0 0
NICHOLSON & ADE, Eastbourne (*accepted*)	280 0 0

For Erection of Coalshed at Workhouse.

Coster, Eastbourne	£49 10 0
BUCKHURST, Eastbourne (*accepted*)	49 0 0

DERBY.

For Building Poor Law Offices, Becket Street, Derby. Mr. ERNEST RYLEY, Architect, Imperial Chambers, Albert Street, Derby. Quantities by Architect.

G. Holmes & Son, Derby	£11,350 0 0
Ford & Co., Derby	11,054 11 0
W. Walkerdine, Derby	10,949 7 0
G. Wagg, Derby	10,709 0 0
W. Eaton, Derby	10,672 0 0
J. Parker, Derby	10,657 13 0
H. Vernon, Derby	10,505 0 0
A. Brown, Derby	10,117 0 0
WALKER & SLATER, Derby (*accepted*)*	10,000 0 0

* Subject to a reduction of 1,750*l.* for work to be omitted.

EASTLEIGH.

For Erection of a new Boys' School in Cranbury Road, Eastleigh, for the South Stoneham School Board.

C. & A. Witt, Bitterne	£3,520 0 0
Morgan, Isted & Morgan, Southampton	3,374 0 0
H. Stevens & Co., Southampton	3,367 0 0
W. R. & C. Light, Portsmouth	3,317 0 0
H. J. Sanders, Southampton	3,295 0 0
T. H. Kingerlee, Oxford	3,146 0 0
J. Crockerell, Portsmouth	3,090 0 0
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Cornes, Hanley	1,050 0 0
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BROMAGE, Longton (*accepted*)	1,040 0 0

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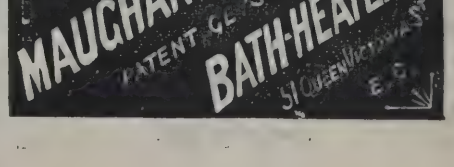
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For Building Five Residences and Three Cottages, Llandudno. Mr. EDWIN TURNER, Architect.

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Evan Williams, Bangor	5,647 0 0
R. Costain, Liverpool	5,308 0 0
Beith Jones, Llanrwst	5,283 0 0
Thomas Jones, Llandudno	4,930 3 0
Jones & Owen, Llandudno	4,930 0 0
ROGER WILLIAMS, Llandudno (*accepted*)	4,576 0 0

LONDON.

For Erection of Dwelling-house and Shop at No. 29 Blackheath Hill, for Mr. J. Bishop. Messrs. G. & W. RALPH LOW, Architects, 10 Basinghall Street. Quantities supplied.

Holliday & Greenwood	£1,540 0 0
Oldridge	1,495 0 0
David	1,485 0 0
Kennard	1,457 0 0
Jerrard	1,439 0 0
Mattock	1,400 0 0
Leng	1,366 0 0
Gorham	1,350 0 0
H. L. HOLLOWAY, Deptford (*accepted*)	1,347 0 0

For Alterations and Additions to No. 19 Warwick Street, Regent Street, for Messrs. Fargues & Co. Mr. WILLIAM A. BURR, Architect, 65 Chancery Lane.

Foxley	£79 0 0
Stevens Bros.	68 8 0
Larke & Son	59 0 0
HOCKING (*accepted*)	50 10 0

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For Business Premises, Skinner Street, Newport, Mon., for Mr. G. Smith. Messrs. W. G. HABERSHON & FAWCKNER, Architects, London, Newport and Cardiff.

Moulton & Brownscombe, Newport	£4,950 0 0
G. Linton, Newport	4,795 0 0
J. G. Diamond, Newport	4,595 0 0
Morgan & Roberts, Newport	4,499 0 0
Wilkins, Newport	4,497 0 0
The Exors. of W. Gradwell, Newport	4,485 0 0
W. M. BLACKBURN, Newport (*accepted*)	4,335 0 0

PENGE.

For Erection of Laundry, for the London and Provincial Laundry Company. Mr. ERNEST TURNER, F.R.I.B.A., Architect. Quantities by Mr. Henry Lovegrove.

Higgs & Hill	£11,940 0 0
Smith & Co.	11,400 0 0
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Bush	10,875 0 0
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John Curnow, Barnet	2,223 0 0
Lorden & Son, Upper Tooting	2,184 0 0
J. W. Savage, St. Albans	2,164 10 0
Boff Bros., St. Albans	2,092 0 0
James Webb, Stratford	2,075 0 0
C. Chamberlain, St. Albans	2,010 14 0
James Payne, Hemel Hempstead	1,990 15 0
C. Miskin, St. Albans	1,982 0 0
Jackson Bros., Gunnersbury	1,940 0 0
T. Martin, Maidenhead	1,940 0 0
THOMAS TURNER, Lim., Watford (*accepted*)	1,937 0 0
Somerford & Son, Clapham	1,913 0 0

TWICKENHAM.

For Repairs to Premises, King Street, Twickenham. Mr. HENRY LOVEGROVE, Surveyor.

T. J. MESSOM (*accepted*)	£503 0 0

TAUNTON.

For Building New Factory, for the Somerset Manufacturing Company. Mr. GEORGE C. STRAWBRIDGE, M.S.A., Architect.

W. Potter	£1,340 0 0
J. Mountstephens	1,262 0 0
A. J. Spiller	1,225 0 0
J. Morse	1,218 0 0
RENDELL & SON (*accepted*)	1,215 0 0

For Alterations and Additions to the Masonic Hall, for the Taunton Masonic Hall Company. Mr. GEORGE C. STRAWBRIDGE, M.S.A., Architect.

H. J. Spiller	£254 0 0
A. J. SPILLER (*accepted*)	250 0 0

TAUNTON—*continued.*

For Alterations and Additions at the Somerset County Club, Fore Street. Mr. GEORGE C. STRAWBRIDGE, M.S.A., Architect.

H. J. Spiller	£270 0 0
C. Fox	261 0 0
RENDELL & SON (*accepted*)	242 0 0

TYLEHURST.

For Kerbing and Channelling about 2,200 feet of Theale Street. Mr. WOODESON, Highway Surveyor, Tylehurst.

Free, Marlborough	£302 10 0
Free, Marlborough	284 10 0
Boxall, Pangbourne	230 0 0
Talbot, Reading	228 3 4
Reeves, Reading	224 0 0
Free & Sons, Maidenhead	208 10 0
WHEELER, London (*accepted*)	207 0 0

WOOLWICH.

For Supplying and Laying Pitcher Paving, Plumstead Road. Mr. H. O. THOMAS, Surveyor.

Woodham & Fry	£398 0 0
Mowlem & Co.	389 0 0
W. Griffiths	380 0 0
Rackham & Bentham	374 0 0

TRADE NOTES.

EXTENSIVE factories have been erected at Leicester, and the most careful attention has been paid to the ventilation, which has been carried out by the "Climax" Ventilating Company, of 15 Great George Street, Westminster, S.W.

A LARGE clock was formally started in the parish church of Kendal on the 11th instant. It is fitted with all the latest modern improvements. The quarters are chimed on four bells, the same as at Westminster, and the hours are struck upon a 25-cwt. bell. The escapement is a double three-legged gravity one, and the pendulum is compensated for changes in the weather, all the wheels have machine-cut teeth, so as to be perfectly accurate, and the whole of the parts are arranged so that any part may be removed without interfering with the others. The work has been carried out by Messrs. John Smith & Sons, Midland Clock Works, Derby.

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„ 13. Dewy Eve.
„ 14. Mousehold Heath.

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MESSRS. WOODHOUSE & RAWSON UNITED, LIMITED, have opened a branch office at 89 Bothwell Street, Glasgow, under the management of Mr. B. F. Howard, who has been appointed agent for Scotland. In connection with this branch a sample room has been fitted up, containing specimens of all their own specialties, as well as of the most approved fittings and appliances of other important makers, so as to afford facility in selection to intending buyers. Any novelties or improved apparatus which may from time to time come on the market will at once be added to the sample room, thus keeping it thoroughly up to date.

A CARVED oak screen has been placed in St. Thomas's Church, Stourbridge, as a memorial by a member of the church. It was designed by Mr. W. H. Bidlake, M.A., Birmingham, and is Classic in detail. It forms a partition which divides the vestry from the chancel. The bottom framing is filled in with cathedral glass to admit light; above this is a richly-moulded string-course, carrying the screen up to the floor of the gallery, and from this level it is continued by moulded columns with elaborately-carved canopies supporting traceried arches and a very handsome overhanging frieze. The whole is richly moulded and carved, and the structure is surmounted by a carved cross. The work was carried out under the personal superintendence of he architect, by Messrs. Jones & Willis, of Birmingham and London.

THE Kirk Hammerton Schools, York, are being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

WE are informed by Mr. Farrar, the London agent for Mr. Wilson Hartnell, Leeds, that he has secured the order for the electric lighting of the new flour mills for Messrs. James Tucker, Limited, Cardiff. When complete these premises will rank amongst the largest in the country.

AMERICAN NOTES.

AS reports have been circulated which raise doubts about the stability of the buildings for the Chicago World's Fair, a memorial has been sent to the Secretary for War asking him to send two military engineers to report upon the character of the foundations and any other parts that have been constructed.

THE assessed value of property in the United States is now double the value that was made out thirty years ago. In 1860 the assessed value was 12,084,560,005 dols., while, according to the last return, it is 24,249,589,804 dols. The richest States at present are New York, Pennsylvania, Massachusetts, Ohio and California. The assessed valuations in these States ran from over 3,775,000,000 dols. to 1,071,000,000 dols. Massachusetts has 962·12 dols. per head of assessed values; Rhode Island, 931·28 dols.; California, 886·58 dols.; Montana, 805·04 dols.; New Hampshire, 671·19 dols.; and New York, 629·44 dols. South Carolina has only 114·83 dols. per head; Mississippi, 122·15 dols.; and Alabama, 130·26 dols.

THE coroner's jury that investigated the cause of the fall of the building in Park Place, New York, have come to the conclusion that the catastrophe originated in a shock. What the shock was due to they were unable to determine. They recommended that the Legislature be requested to authorise the establishment of a bureau for the periodical inspection of manufacturing premises.

AN Odd Fellows' temple is about to be constructed in Chicago. The ground space is to be built up to a height of fourteen storeys, and above this the building extends six storeys in the form of a square cross, the four spaces at the angles of the main building being left vacant. Above this is to be a tower-shaped structure fourteen storeys high, making thirty-four storeys altogether, with an aggregate height of 556 feet. The estimated cost is 3,500,000 dols. The ground space covered is to be 177 feet by 233 feet.

ONE of the greatest curiosities of the Chicago World's Fair promises to be that sent by Tulare, California. A redwood tree is growing there which is 390 feet high. It is intended to cut from this tree a log 90 feet long and 20 feet in diameter. By cutting the log in half and hollowing out each portion, it will be turned into two railway carriages, one fitted up as a dining-car, with buffet, bath-room, barber's shop and kitchen, the other to be a sleeping car, with an "observation" room. The rough bark of the tree will be left on for the roof, while the sides and ends will be of the natural wood unpolished. The cars will be occupied during the exhibition by the families of the makers, and the rest of the tree will be cut up and worked into souvenirs.

MR. S. P. STICKER, an engineer, of Buffalo, N.Y., claims to have discovered a method of making ice by means of illuminating gas, which may be returned to the mains after use without deterioration. By experiments in the works of the

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VARIETIES.

THE Leith Dock Commissioners have prepared a draft Bill to be presented to Parliament next year for the construction of a new dock. It is proposed to reclaim an area of about 54 acres, in which a deep-water dock, about 1,000 feet long and 375 feet wide, will be constructed. Sir Alexander Rendel has proposed that the lock should be so constructed as to permit vessels going in and out in almost all states of the tide.

THE Steel Company of Scotland, Limited, produced during the year just ended 160,000 tons of steel ingots. In the preceding year the quantity was 260,000 tons. The deficiency is owing to strikes among workmen.

THE city superintendent of Edinburgh has been instructed to prepare a plan for carrying the main staircase of the City Chambers down to the basement, including an entrance from Cockburn Street.

THE Tewkesbury Town Council have agreed to allow the use of the Corn Exchange for science and art classes, and to permit a laboratory being built on land in rear of the Town Hall.

THE Local Government Board have sanctioned application for a loan of 1,300*l.* for building an addition to the Town Hall of Dalkey, near Dublin.

PUBLIC baths are to be erected near the Griffin Inn, on Cheetham Hill Road, Manchester.

DR. CHURCHILL JULIUS, Bishop of Christchurch, New Zealand, with his own hands has laid the top brick of his cathedral spire at a height of 270 feet from the ground, having been hauled up seated in a chair fixed at the end of a rope.

A PUBLIC inquiry has been held at the Town Hall, Halifax, respecting an application by the Corporation to the Local Government Board to borrow 111,560*l.* for various improvements. The amount included 50,000*l.* for new markets from the selected designs of Messrs. Leeming & Leeming, 7,000*l.* for baths at Woodside, 30,560*l.* for new streets and street improvements, 20,000*l.* for sewerage, and 4,000*l.* for walks and pleasure-grounds. There was no opposition to any of the schemes.

MR. RICHARD J. COLLIER, of 34 Finsbury Pavement, E.C., held a very successful sale of building land at Freshwater, in the Isle of Wight, on Thursday, September 17. This is the second portion of the Afton estate, Freshwater, and it will be remembered that Mr. Collier's sale of the first portion was also a great success. The land realised nearly 4,000*l.* Building land in the Isle of Wight seems to be a sound investment, and very popular at the present time.

IT is proposed to hold an exhibition next year in Southport in celebration of the centenary of the town.

VISITORS to Blackpool next summer will find three instead of two piers. The intended new pier, which is shortly to be commenced, will be situated near the tram terminus opposite Station Road, South Shore, and will be the first erection of any kind in that district devoted to purposes of entertainment. There have been during recent years large extensions at South Shore, and the new pier will, it is expected, lead to its further development as a residential district. Already there is a residential population of 30,000 to 40,000 visitors in the district every summer.

THE largest lumber mill in the world is supposed to be one at Port Blakeley, Washington. Last year this mill turned out 69,000,000 feet of lumber, over 28,000,000 laths, and a large amount of other stock.

THE value of the timber and the timber-products exported from Norway during the past year was 2,453,881*l.*

ACCORDING to the *Essex Herald*, the Colchester Museum contains a curious exhibit, presented by a mysterious "John Smith, Esq." It consists of a solid block of Roman mortar from the Town Wall, with a heap of crumbling white dust by the side, described as "Mortar with which the town wall was repaired in the nineteenth century."

THE artesian well at the artisans' dwellings in the Minories has at length reached the contract depth of 352 feet, and yields from 17,000 to 19,000 gallons of water daily. The dwellings contain 1,200 inhabitants, and as it is desirable to provide a minimum supply of 20 gallons per head per day, the Commission of Sewers for the City have agreed that an additional depth of 100 feet in the chalk should be sunk.

MR. THOMAS MOBLEY, of Birmingham, died this week in his eighty-seventh year. Until a few weeks ago he worked regularly at Messrs. Tonks, Limited, by whom he had been employed for no fewer than seventy-three years. He was senior

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trustee of the Brassworkers' Association, and was regarded as the "father" of the trade, and the oldest brassworker in the world.

LADY VERNON, of The Towers, Poynton, has intimated that she will present a reredos of Derbyshire alabaster to St. George's Church, Poynton. Designs have been made by Mr. Alfred Darbyshire, F.R.I.B.A. It is also contemplated to spend 300*l.* on the beautifying of the church.

MR. W. H. RADFORD, C.E., of Nottingham, has been instructed by the Corporation of Durban, Natal, to draw out plans and specifications for the supply of six miles of steel tram-rails, with all necessary fittings.

THE John Hampden monument on Chalgrove Field affords an instance of the precautions taken by local authorities to circumvent the ways of tourists. So many names, principally those of Americans, have been carved upon the obelisk that a ditch has been dug round it and a railing erected to keep visitors at a safe distance.

THE consideration of the long-delayed building by-laws for the city of Bombay, remarks the *Bombay Gazette*, has at length drawn nearly to a close, so far as the labours of the Corporation are concerned. To the professional mind there is something of the ridiculous in an assembly of laymen, who know nothing about the dimensions of beams and joints and the scantlings of roof-timbers, and the pressure upon bricks and mortar, whether "good" or otherwise, discussing formulæ and voting as seems best to them sections of whose real bearing and operation they cannot form any clear idea. However, the work has got to be done, and it has been done somehow.

DEAN ARGLES, who has already largely subscribed towards the restoration fund of Peterborough Cathedral, is going to present the new marble pavement, which will cost 2,400*l.*

A FREE library is to be erected in Kidderminster at a cost of 3,213*l.*, exclusive of fittings. Towards the cost subscriptions amounting to 1,433*l.* have been promised.

A LOCAL Government Board inquiry has been held at Huyton, near Liverpool, in respect of the application of the Local Board to borrow 3,000*l.* for the erection of offices, according to plans by Mr. H. A. Cheers, Twickenham.

A FREE University has just been opened at Gotheborg. This institution has been called into existence entirely by the munificence of several generous citizens, and has received no State aid whatever. In 1878 two rich merchants, Messrs. Lundgren and Magnus, gave 600,000 kronen towards the building of a high school, and in 1885 a wealthy brewer added the munificent gift of half a million kronen. In November 1887, when the subscriptions had reached 1,750,000 kronen, the Municipal Council resolved to form a University, for which the services of many learned professors of Upsala and Lund have been secured.

BUILDING AND BUILDERS.

THE foundation of the Kingswood Reformatory has been laid. The contractors for the buildings are Messrs. Love & Wait, of Bristol.

MESSRS. MACDONALD & SON, of Hawick, who some time ago secured the contract at 6,000*l.* for carrying out a sewerage extension scheme for the Corporation of Workington, in Cumberland, according to the *Scotsman*, have had to suspend operations owing to the alleged impracticability of the working drawings supplied by the officials of the Corporation, and they have caused a writ to be served upon the Corporation in an action to recover 7,000*l.* for work done and damages. The case will be tried at the next assizes at Carlisle.

A SALVATION ARMY citadel is about to be erected in Aberdeen from the designs of Mr. Souttar. It will cost at least 15,000*l.*

A NEW Board school is about to be erected by the Rochester School Board in the Strood division of the city.

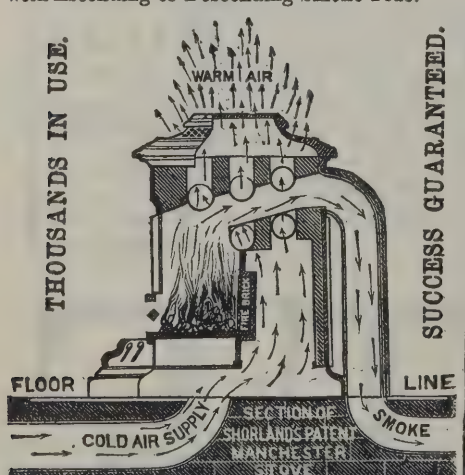
THE Ramsgate Town Council have resolved to commence the authorised improvement by which West Cliff and East Cliff will be united. Tenders will immediately be sought for the execution of works on the first section between the West Cliff and the Town Quay.

A REMEDY FOR SMOKY LONDON.

IN the *City Press* there is a long communication from Mr. Harry G. Assiler, in which he advocates the removal of factories from London as the first measure which should be adopted in dealing with the London smoke nuisance. He says:—

As a rule a variety of alternative remedies are open to us for the majority of the evils which trouble us in this life, and in all cases it is well to review them in order that we may see which is the best under the circumstances before taking action, and

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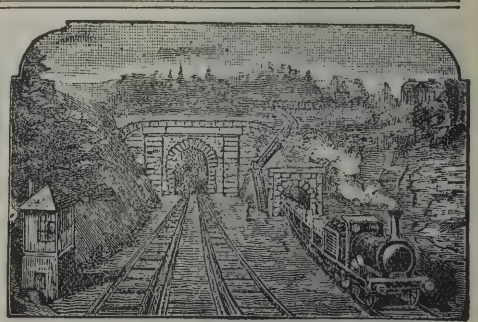
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The Tivoli Theatre
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not rush at the first one which presents itself, dismissing at first glance all others as impracticable, without looking minutely into them, and carefully weighing and following out their effects to the fullest extent. Such must be our treatment of the smoke question. We suffer from an evil, and the first thought to rid ourselves from it if it is an unmixed evil is to remove its cause—cut off its source. If the evil is not unmixed with good, we naturally seek some remedy for reducing the evil while retaining the good. This is particularly the case with the present subject—we can hardly do without fires, but we could do very well without their resulting smoke.

With regard to domestic fires, we cannot abandon them; there is no doubt, however, that the evils which arise from this cause could, by careful arrangement, be so reduced as to be of little moment, if not altogether removed. The domestic fireplace is, no doubt, at the present time a very serious offender, but this is because no effort is made to consume the smoke or mitigate the evils arising therefrom; the great and most difficult offenders to deal with are the factories. We may assume that in nearly all cases every effort is made, and the best known appliances used for consuming the smoke of factories, but still the smoke escapes unconsumed—the factory owner, if indicted, shows he has used the best known smoke-consuming apparatus, and his liability ends (16 and 17 Vic. c. 128, s. iii.).

This state of affairs indicates that if London could be ridded of factory chimneys and furnaces, it would be a comparatively easy task to consume that proportion of the smoke contributed by domestic fires, by the introduction of a new system of burning fuel; it is well-known that the present form of fireplace is wasteful and productive of evil, and the system is undoubtedly radically wrong. And on the same principle that a builder or owner of a house is compelled to trap off the drains from the sewer, or build up his party walls above the roof, and do scores of other things to satisfy the provisions of the law, he might be obliged to provide smoke-consuming stoves.

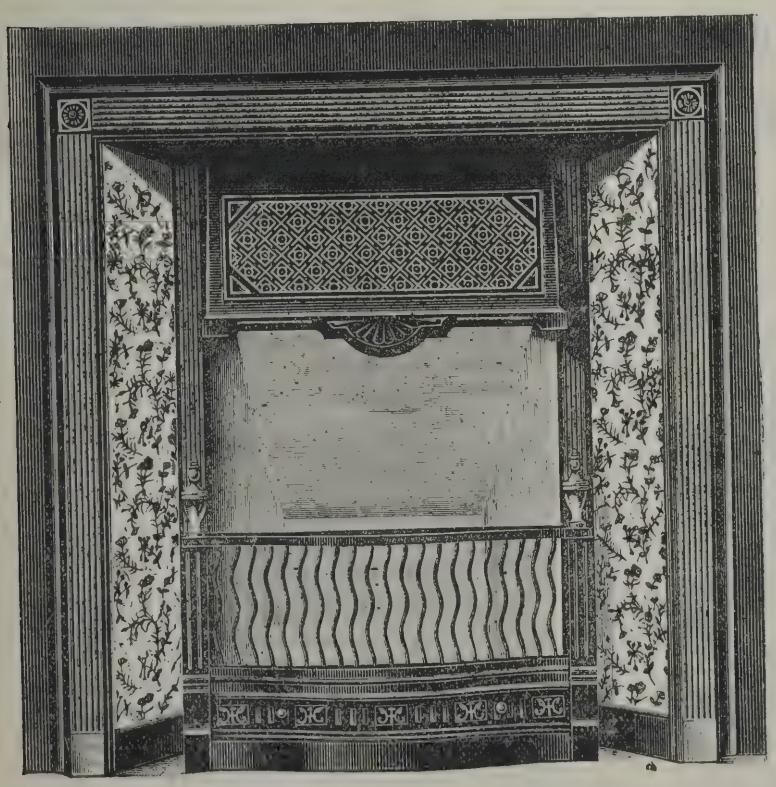
The question presents itself therefore:—Is there any valid reason why all factory chimneys and shafts should not be banished from the metropolis, and not permitted within a certain radius—say ten miles of the Bank of England? The expense in the way of compensation would of course be a considerable item, but it is ventured that the annual value to London of the consequent clear atmosphere would compensate for it. And by judicious treatment the amount of compensation, while being fair, need not be of very serious proportions, although in the total it would be undoubtedly of some considerable magnitude. It will readily be seen that a large proportion of the manufacturers now carrying on business within the suggested prescribed area would, under such conditions, have only to transfer a portion of their business—in many instances a minor portion—outside the radius, their premises still being available for the greater part of their business. And then less space would be required for the business in London, and rents being lower outside, and access easy to all parts, the cost of production would not be prejudicially affected; indeed, it would probably be lowered.

Another good effect resulting from the adoption of such a course would be the removal of a large portion of the working population, who are now compelled by circumstances to live in crowded, unhealthy localities in town in order to be near their work, to much healthier surroundings in open suburban quarters, so the benefit would be twofold. There are hundreds of spots eminently suited for the erection of factories around London, especially on the north and west, with which first-class communication, both by railway and canal, already exists.

Having got rid of the factories, we should have reduced the item to a considerable extent; but we should still have the smoke from domestic fires and other sources as yet uncontrolled, with which we should have to deal. It has been suggested that the open fireplaces should be done away with, and dwellings warmed by a central heating chamber, or that several dwellings even should be warmed in combination. It is to be hoped that we in England will never come to this. Forced as we are by the nature of our climate to spend much of our time indoors, we have become endeared to the open fireplace, and find great comfort in it, and it is, besides, a ready means of affording ventilation—a matter of great moment.

It may be urged that such a measure would be a retrograde step savouring somewhat of the Middle Ages, when the use of smoky coal brought by sea from Sunderland and Newcastle was prohibited in London, and impracticable, as interfering with the "liberty of the subject" upon which we English people pride ourselves; but when there is so much freedom surely it becomes more a matter for consideration that that freedom should not be used to endanger the well-being of the community. A person has the power to protect himself against the existence of deleterious matter in water by boiling, filtering, &c., but how is he to protect himself against the effects of the carelessness and wilfulness of those who poison the atmosphere? And even if the "liberty of the subject" is to an extent interfered with—although it is not admitted that the course suggested

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PATENT No. 2496. A.D. 1884.

would unduly interfere with it—it would be for everybody's benefit; but, apart from this, the whole essence of the matter, and what must in the end be relied upon to alter the present state of things is public opinion. Were it generally shown how highly demoralising the atmosphere of our metropolis is, and some feasible and rational means of ridding the great city of its dreadful pall brought forward, people would not be slow to adopt it. Let it be considered what a tremendous saving would be effected, even in the cost of illumination rendered necessary by the present prevailing smoke-laden fogs, let alone the cost of repairing, redecorating and cleaning buildings, the fabrics of which, as well as other objects and materials, are ruined and destroyed by the present atmosphere of the metropolis. Taking all these things into consideration, one feels justified in expressing the opinion that, although the compensation necessary to remove the factories and alter the existing state of affairs in the City would mean, for a time, an increased charge on the rates, the sum payable in this way would not exceed that which is now paid away through hundreds of other channels on account of the ravages of the fog demon, and which would entirely disappear were the destructive properties of the smoke and gases removed, in addition to which there would be the inestimable luxury derived from having a comparatively pure atmosphere which the denizens of London, even when befogged, might breathe in safety. Let any one acquainted with the matter sit down and carefully think out the expenses which may be traced, directly or indirectly, to the smoke, and try to form an opinion what it costs the citizens of London annually for the luxury of perpetually living in a smoky atmosphere with nice periodical black fogs, and then consider whether it will cost much more to remove the nuisance than to fight it.

MUNICIPAL CONTRACTS IN EDINBURGH.

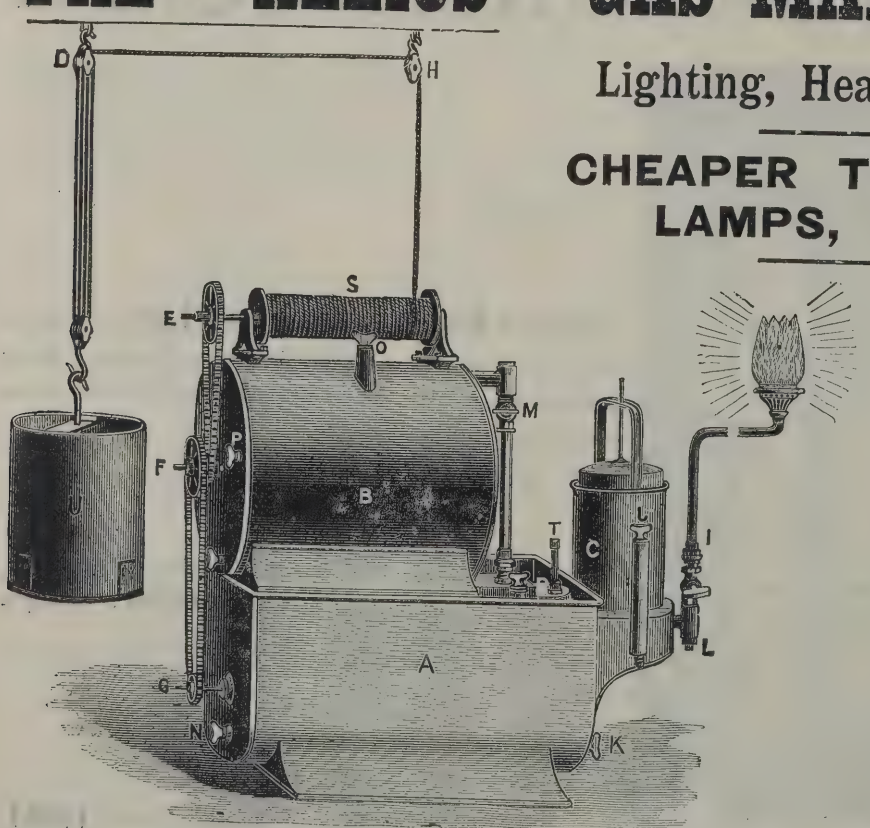
AT the meeting of the Edinburgh City Council on Tuesday Mr. Lang Todd asked whether any explanation could be furnished as to a complaint of Messrs. William Gray & Son, Frederick Street, who had held the contract for 1890-91 for smith and ironmongery work required by the Corporation, that all the work in these departments had not been given to them. Bailie Russell, convener of the Public Health Committee, replying, said the firm in question had made a complaint of this character in May, when the matter had been remitted to the Public Health Committee, and from them to the Law Committee, and on looking up the committee's minutes he found the word "delay" opposite the entry. He was prepared to make an explanation in regard to the matter, and he thought he could best do so by reading the report from the City Superintendent (Mr. Morham) to the committee, made on May 12, 1891. This report was to the effect that the complaint proceeded on the assumption that the contractor for the smith and ironmongery work was entitled to be employed in providing everything in his line of business that might be required for the Corporation purposes during the currency of the contract. According to the City Superintendent, the contract consisted of an undertaking on the part of the contractor to keep in order the locks, hinges, &c., of the various city properties, &c., and "a schedule of prices for day work, jobbing and repairs, and for materials not included in the foregoing." There was no word of the supply of general ironmongery furnishings or of made-up goods being included in it. On the other hand there was, the City Superintendent stated, an express provision that the magistrates did not bind themselves to take everything from a contractor, and reserved full powers to enter into any special contract where that course was considered desirable. The employment of ex-Bailie Walcot had arisen from the purchase through him of two of the gas-cooking stoves from the exhibition. Being thus on the premises, ex-Bailie Walcot, according to Mr. Morham, had been afterwards employed, with the sanction and express direction of the Public Health Committee, to provide a number of other furnishings and pieces of work more or less in connection therewith. This had been in no way inconsistent with previous practice with regard to such furnishings, &c., both for the City Hospital and Campie House, where Mr. Foulis had been employed to provide a very large number of ordinary furnishings, as well as specially-made articles, though not general contractor for the time. As regarded the repair of the park-fences and tree-guards, distinct instructions, the report said, had been given by the Public Parks Committee to employ firms who were specially in the habit of dealing with such work, rather than the contractor for ordinary smith-work. Bailie Russell added that in case any one should ask why it was that the committee had not bought from the firm of William Gray & Son that which the committee held to be outside the contract, he would just say that in the urgent work of the hospital last winter the committee had to go to people who they were sure would act promptly and successfully. The committee could not, in the urgent circumstances, go to any person for the required work unless they knew that

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they would put themselves about to serve the committee as Mr. Walcot and Mr. Foulis had done. After a short conversation the matter dropped.

THE BRIGHTON RAILWAY.

THE Act for the incorporation of a company to construct a railway between London and Brighton received the Royal Assent on July 15, 1837. The number of shares was to be 36,000 of 50*l.* each, or 1,800,000*l.* An additional sum of 600,000*l.* was allowed to be borrowed, making in all 2,400,000*l.* But that sum does not represent more than a part of the outlay on a system of which the jubilee is celebrated this week.

The Act was not obtained without one of the toughest fights ever witnessed in Parliamentary committee-rooms. According to Mr. Francis the London and Brighton contest was a proverb for reckless extravagance. Mr. Whishaw, writing when the works were nearly completed on the Brighton section, said:—Parliamentary contests are never carried on without a great sacrifice of money. How much more judicious a plan would it be for parties interested in competing lines of railway to refer the selection of the best plan to competent and disinterested engineers "out of doors," and thus leave the course in the various stages of its progress through Parliament comparatively clear, and uninterrupted by vexatious and unnecessary opposition. There cannot be a more easy task allotted to an engineer, who is thoroughly conversant with railway matters, and has the details of each laid before him, than to select from two or more projected lines of railway that which ought on all accounts to be chosen. Had such a method been adopted with regard to the various lines projected to Brighton, a large sum of money would have been saved for the more useful purpose of constructing the great works which had to be encountered in effecting a railway through the natural barriers between London and Brighton. As it is, the direct line has been chosen; but a more difficult and expensive one could not have been selected. Many of the engineering works are of a formidable character, and are necessarily prosecuted by night as well as by day, in order to open a portion of it as early as possible, according to the intention of the board of directors. As a forced march through a rugged country is attended with considerable fatigue to soldiers encountering it, so a forced passage for a railway through any district, however easy, for the purpose of effecting a premature opening, is alike attended with considerable risk to the traveller, and an unnecessary sacrifice of funds on the part of the proprietary.

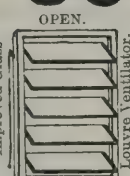
The Stockton and Darlington Railway made it plain that a new mode of communication was feasible, and in 1825 a scheme was put forth for the construction of a line from London to Brighton, but the public did not respond, and as the money was not forthcoming there was no practical result. Various attempts were subsequently made to get up a company, but they all failed. In 1835 there was more faith in railways, and several proposals for a line to Brighton were brought forward. It was no easy matter to determine the respective merits of the competing projects. A correspondent of the *Times* says that if "read in the light of present-day experience, much of the evidence that was given before the committees, even by engineers of such eminence as the two Stephensons, Rennie, G. P. Bidder, Vignoles, Mills, Locke and others is amusing, and some of it is almost absurd. The utmost speed claimed for the line with the easiest gradients was thirty miles an hour, and Bidder made much of the point that a train could not run over Rennie's line at a greater speed than twenty-five to twenty-eight miles an hour. Many trains have now for a number of years past been running over practically the same ground at a speed of fifty miles an hour. No one at that time appears to have anticipated that the distance between London and Brighton could be covered in less than two to two and a half hours, whereas now about an hour is the actual running time of the express trains. The great forensic lion of that day in the Parliamentary committee-rooms was Serjeant Mereweather, who tried hard to nonplus the most skilled engineers, and before whom even George Stephenson, excellent witness and wideawake as he generally was, found it difficult to hold his own. A great point made, or attempted to be made, against Stephenson's line through the valley of the Adur, was that it was liable to heavy fogs. "Your weak mind," said the Serjeant, addressing the elder Stephenson, "would be astonished if you heard that the fog there sometimes lasted for a week or ten days. . . . Is that a pleasant thing for a railway to pass through?" "It would be an objection," said Stephenson, "but not sufficient to deter you from taking a railway through a country. I should consider the fogs in the neighbourhood of London much more objectionable than they could be in that valley." "Then," said counsel, "your conclusion is that, as you must have a London fog at one end, it would be convenient to have a country fog at the other; you would like to have the two termini alike!" An attempt was made to prove that Stephenson *père*, who was usually very conscientious

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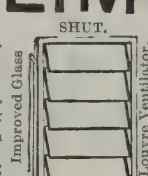
MEDAL AWARDED, 1884.



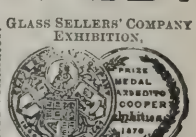
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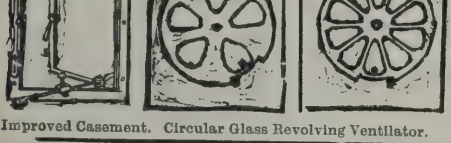
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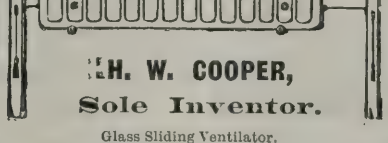
GLASS SELLERS' COMPANY EXHIBITION,



MEDAL AWARDED, 1876.



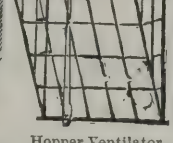
Improved Casement. Circular Glass Revolving Ventilator.



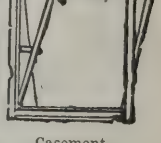
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in his work, had not examined the route of Rennie's proposed line with sufficient care to be able to give a sound opinion upon it. "You went down on the top of the coach," said Mereweather to the great engineer, "with three persons in front, with a map and section before you; that was one examination; and the other was in a post-chaise, some part of the time being spent in getting a good lunch, and you got out of the chaise and walked now and then, to increase your appetites, all in one day?" "Yes," meekly replied the engineer.

The lawyers and agents could hardly desire a speedy selection of the line. The Parliamentary expenses of Sir John Rennie's project amounted to 72,000*l.*; Stephenson's, 53,750*l.*; Gibbs's, 26,325*l.*; while Cundy's amounted to 16,500*l.* only. If compared with the outlay over Bills in later years the sums will, however, appear exceedingly moderate.

The line selected was the combination of Stephenson's and Rennie's. It started from the London and Croydon Railway, at about 9¼ miles from London, and terminated at Church Street, Brighton. The length of the main line was over 42 miles, and the total distance to the terminus of the Greenwich Railway 51 miles 55 chains. The earthworks were soon found to be heavy. The excavations amounted to 6,861,683 cubic yards, or over 156,000 cubic yards per mile, exclusive of tunnelling. In July 1839 Mr. Rastrick reported that 4,769 men and 570 horses were employed; in the July of 1840 the numbers had increased to 6,206 men and 960 horses, with five contractors' engines.

Most of the bridges were constructed in brick, with stone dressings brought from the Heddon quarries, Newcastle-on-Tyne. On the original line, to which alone we are referring, the principal tunnels were those at Merstham, Balcombe and Clayton Hill. The Merstham tunnel is through chalk, which was raised to the surface of the ground by double horse-gins, one at the top of each of twelve vertical shafts, from whence the skiffs were moved on small trucks by means of tramways, and their contents deposited in spoil-banks. Mr. Rastrick described the ground in the Balcombe tunnel as very treacherous, requiring great caution on the part of the miners in working it, as "it swells and effloresces as soon as exposed to the air."

So many changes and additions were approved, it is difficult to calculate the cost of constructing the line. As well as it could be made out in 1840, it amounted to 37,568*l.* 17*s.* 6*d.* per mile. At the first meeting of the company the shareholders were assured, on the authority of Messrs. Rennie and Rastrick, and Mr. Locke, who represented Mr. Stephenson, that the cost would not exceed 23,376*l.* per mile. After so great an excess over the anticipated cost, it is no wonder so long elapsed before dividends were obtainable.

The growth of traffic was also under-estimated. As the *Times* correspondent says:—At the time when the proposed railway to Brighton was occupying the attention of Parliamentary committees, there were thirty-six coaches running between London and that town. These were unitedly licensed to carry 3,453 passengers per week, and their actual weekly average in the year 1835 was 2,263, or a total of 117,676 per annum. The average fare paid by each passenger was 21*s.* for inside and 12*s.* for outside seats, and the average time occupied on the journey was six hours. Two mail coaches ran daily, included in the thirty-six already named, and these made fourteen journeys per week, carrying nine passengers on each journey. There were, however, other distinct services between London and Worthing, Bognor, Horsham, Dorking and Epsom, as well as regular services between Brighton and Worthing, and between Brighton and Shoreham and Steyning. Finally, there was a special service of two coaches between Windsor and Brighton, which carried, on an average, 144 passengers per week, and occupied eight hours on the journey. The total value of the passenger traffic on these several services, including Brighton and London, was in 1835 about 123,300*l.*, and in the calculation of the traffic to be expected on the proposed new Brighton line it was believed that, at an average single fare of 8*s.*, the number of passengers to be carried by the railway would be about double that carried by the stage coach, which would give a total annual gross income from direct passenger traffic between the metropolis and the Sussex terminus of the line of 94,120*l.*, the total passenger income of the line being estimated at 156,000*l.* The direct passenger traffic to Brighton was, of course, expected to be the most productive source of income, inasmuch as the proposed line, although over fifty miles in length, did not pass through any populous places. Indeed, the whole population of the parishes on the line of route was given before the Lords' Committee of 1836 as only 35,200, Horsham with a population of 5,105 being the most important.

From these modest anticipations the Brighton Railway system has advanced until it stands to-day the fifth on the list of the great passenger-carrying lines of Great Britain, being exceeded in reference to the numbers carried only by the Great Eastern, the London and North-Western, the Great Western and the Lancashire and Yorkshire Railways. In 1890 the Brighton and South Coast Railway carried forty-three

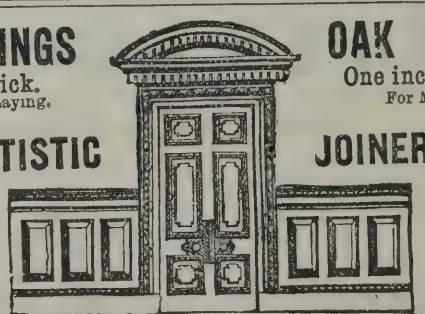
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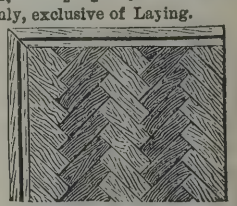
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and a half millions of passengers, or more than four hundred times the number estimated in 1835, while the gross income from passenger traffic, instead of being only 156,000*l.*, has been 1,650,000*l.*, or more than ten times as much, and that, too, with a very greatly reduced range of fares. It is true that only a comparatively small number out of this enormous number of passengers travelled between London and Brighton. Indeed, the average fare, instead of being a fraction over 7*s.* per journey, which was the estimated average of 1835, has only been about 9*d.*, which means, of course, that the great bulk of the traffic has been short-distance. But the Brighton fares have been very greatly reduced, so much so that the average third-class return fare is now less than the estimated single fare in 1835, and many thousands of passengers are annually carried from London to Brighton and back for a fare of 3*s.*, or one-half the estimated single fare at the time the railway was projected. Instead of having only fifty-eight coaches on the whole route between London and Brighton, including those that made journeys between intermediate places, the Brighton Company has now 2,198 passenger carriages, each capable of carrying about forty passengers per journey, as compared with nine passengers carried by the stage-coaches, and these are moved by no fewer than 410 locomotives belonging to the company, as compared with 250 to 300 horses employed on the turnpikes.

Marvellous as has been the development of the traffic in passengers, it has hardly been more so than the revolution that has taken place in the transport of goods and minerals, although the Brighton is not by any means one of our chief freight-carrying lines. On the contrary, it only stands twentieth on the list of such railways, and is excelled in respect of both mineral and general merchandise traffic by many lines of less extent and general importance. The total tonnage of goods traffic carried direct between London and Brighton in 1835 was stated before the Lords' Committee to be 7,280 tons, the average rate of transport being 55*s.* 6*d.* per ton, and the total annual traffic yielding a gross sum of 21,353*l.* The total traffic carried over the whole system of the projected railway in 1835, including Shoreham, Horsham, Dorking, Epsom and intermediate places of less account, was 143,665 tons, and the gross receipts were stated at 96,963*l.* In 1890, however, the total freight traffic carried on the Brighton system was 2,870,000 tons, and the receipts therefrom were 607,700*l.* The traffic had, therefore, increased to the extent of fully twenty times what it was in 1835.

THE WOOD-CARVING COMPANY.

THE Wood-Carving Company, Limited, lately formed—the registered office is in Birmingham—have produced a series of mouldings which will revolutionise the trade. The company very wisely do not propose to interfere with hand carving, but we must take the world as it is, and undoubtedly a large number of people who would be desirous of having handwork cannot pay the price; they may well be satisfied with the productions of the Wood-Carving Company as a substitute. The process is so effectual that the most delicate work can be produced. An example of the application of the egg and tongue as ornament shows as fine outlines as any artist could wish for, and the execution has the sharpness of delicate metal-work. The ornament of all styles, ancient and modern, can be reproduced not only with marvellous fidelity, but with a spirit that is uncommon in the work of the class. There is a large field for the application of the new carved mouldings, and many architects and builders will be glad to have such a process at command. Original designs can of course be produced as well as the forms which may be considered as standards of ornamental art. The mouldings are applicable in other ways besides in building. Already they are meeting with a ready sale, and the directors and shareholders deserve to be successful.

GUILDFORD SEWAGE SCHEME.

A PUBLIC inquiry was held at Guildford on the 9th instant, by Mr. Arnold Taylor, C.E., of the Local Government Board, on the application of the Guildford Town Council for sanction to borrow 35,000*l.* for purposes of sewerage and sewage-disposal works. The town clerk, who appeared in support of the application, said the matter had been very carefully considered by the Town Council for several years in order that the sewage might be disposed of without nuisance to anybody. So long ago as 1888 they appointed a committee which visited many places where sewage works were in operation, and came to the conclusion that the sewage should be dealt with by the system of the International Water and Sewage Purification Company, which they saw in successful operation at Acton. Under that system the sewage is first treated in precipitation tanks with ferozone to remove the solids, and is then passed through Polarite beds, such as are in successful use at Acton, Hendon, and other places. These polarite beds have a remarkable



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effect in rapidly oxidising the organic matter in solution, and analyses show that this process produces a much purer effluent than can be obtained by any other process.

Mr. C. Nicholson Lailey, C.E., of Westminster, as well as other engineers (several of whom recommended the International Process), prepared plans for the scheme, and Mr. Lailey's plans were finally selected, and accordingly adopted, by the Sanitary Authority.

A large landowner having a residence near the proposed outfall works engaged Mr. Baldwin Latham to consider whether the purification works, as recommended by Mr. C. N. Lailey, were likely to cause a nuisance, and it was reported that he had no hesitation in saying that works of this character, if properly designed and carried out and attended to, could be made satisfactorily to deal with the sewage without the slightest nuisance arising even on the land itself. Sir Joseph Bazalgette also reported in favour of the scheme.

The inspector expressed his entire approval of the scheme, stating that it was necessary to have the best system, because the effluent discharged into the river Wey would ultimately reach the Thames above the water companies' intake. It is intended to proceed with the scheme without delay.

ECCUP RESERVOIR.

A VERY interesting stage has been reached, says the *Leeds Mercury*, in the work now being carried on at this reservoir. It will be recollected that some time ago serious leakage took place, the amount of water running to waste being calculated at about two million gallons per day. When measures were at first taken for dealing with this state of things, holes were bored in the hope that cement might be poured in such quantity into these receptacles that the waste of water might be obviated, or at least very materially lessened. This step did not meet with the success that was hoped, and the plan of excavating, with the object of ascertaining the condition of the puddle wall, was then agreed upon. This excavation has now proceeded so far as to discover pretty accurately the state of things the Waterworks Committee have to deal with. As will be remembered, large quantities of cement were used for the purpose above stated, no less than 33 tons being placed in some of the bore-holes. Strange enough, as it seemed at the time, the whole of this material disappeared, and it is now seen that it found a lodgment at or about the level to which the excavations have now reached On Friday last ridges of this cement, in one case no less than 90 feet in length, were brought to view, and it was seen that several of them ran right across the wall of puddle. These accumulations of cement are situated in what must have been fissures in the wall, and it is evident that the discolouration of the water, which at one time escaped from the reservoir, must have been due to the washing away of the puddle during its passage through these crevices. While a tolerable idea exists upon the manner in which the fissures were originally formed, it will remain for the next two or three months to declare with closer accuracy how the existence of the crevices came about, and why the puddle in the trench did not sink uniformly, so as to preclude the possibility of such fissures being made. It is believed that the work now in progress will shortly reveal the real nature of the defect for which search has been made. Altogether, apart from the quantity of water lost by leakage, it is clear that the wearing away of the clay structure could not have been allowed to continue, and altogether the Waterworks Committee and Mr. Hewson, the engineer, may be congratulated upon the self-evident results of their operations.

THE DRAINAGE OF NEWBURY.

THE Corporation of Reading having made complaint to the Local Government Board that the Corporation of Newbury had failed to provide their town with sufficient drainage, Mr. S. J. Smith, one of the inspectors of the Local Government Board, held an inquiry in the Council Chamber, Newbury, on Wednesday. The petition of the Reading Corporation to the Local Government Board having been read, Mr. G. M. Freeman explained that since 1879 there had been constant complaints to the Local Government Board from the Reading Corporation as to the lack of proper drainage arrangements at Newbury, and the great danger to the health of Reading caused by the outflow of the Newbury sewage into the Kennet. The Local Government Board had repeatedly sent communications to the Newbury Corporation on the subject, notwithstanding which nothing practically had been done to institute a remedy. In October, 1883, a Local Government Board inquiry with reference to the drainage of Newbury was held in that town, when a scheme, which had then been formulated, was approved, and sanction was given to borrow 25,000*l.* towards the cost of carrying out the works. Up to the present time, however, nothing effectual has been done to



remove the evils complained of. Mr. M'Intyre, on behalf of the Newbury Corporation, admitted that there were not sufficient sewers for the drainage of the town. His clients fully admitted that they were in default in this matter, and they were willing to submit to the inspector's order. The only question was the time which the Local Government Board would give them in which to begin and complete the works. After evidence by Mr. Walker, manager of the Reading Waterworks, and Mr. Anstie, the engineer, the inspector decided to allow the Newbury Corporation three months to carry out the preliminary arrangements for efficiently draining the town, and eighteen months to complete the works.

PUBLIC BATHS, ASTON.

ON Wednesday the foundation-stones were laid of a suite of public baths for Aston. The buildings will be situated in the Victoria Road, the site having been presented by Messrs. William & Edward Ansell. The design of the building is Classical Renaissance, and the material terra-cotta, similar to that employed in the Victoria Courts. There will be a frontage of 80 feet, and the elevation to the cornice will be 18 feet, and to the ridge of the centre pediment 40 feet. All the requisites of a modern swimming and washing establishment will be introduced, and these will include what will be known as a soap plunge-bath, to be used where necessary as a preliminary to a bath in the public baths, where soap will be forbidden. There will be first and second-class gentlemen's swimming-baths, and both baths will be set apart for ladies on particular days to be subsequently arranged. The first-class swimming-bath, which will be lined with white glazed bricks, will be 78 feet by 30 feet, and will have an area of 3,042 square feet. It will vary in depth from 3 feet 6 inches to 6 feet 6 inches, and there will be forty-three dressing-boxes, with brick partitions. The second-class bath will be 60 feet by 33 feet, with fifty-nine dressing-boxes. There will also be a number of private baths for ladies and gentlemen around the first-class bath. There will be a promenade gallery and a reserve gallery over the principal entrance, the two being capable of accommodating 500 people. The total cost of the buildings will be between 11,000*l.* and 12,000*l.*, and it is estimated that the site is worth 1,200*l.* The water will be derived from an artesian well, and will be pumped into a tank capable of containing 24,000 gallons. Mr. F. N. Stephen is the builder.

MUNICIPAL CONTRACTS.

THE report of a special committee appointed to inquire into alleged sweating in carrying out corporation contracts, and to consider and report as to a proposed fair-wage clause in future contracts, was discussed at last week's meeting of the Liverpool City Council. The committee recommended that each person or firm applying to be placed on the list of corporation contractors be requested to sign an undertaking to pay the rate of wages and observe the hours of labour recognised and agreed upon between the trade unions and employers respectively in the locality in which the work for carrying out the contract is to be performed, or such a rate of wages and hours as are equivalent or approximate thereto, so that they will not transfer, assign or underlet, directly or indirectly, the contract or any part, share or interest therein without the written consent of the corporation, under the hand of the town clerk, and that they agree to a condition being inserted in the contract to carry out this undertaking. When Mr. Houlding, the chairman of the committee, moved the adoption of this recommendation, an amendment was moved to leave out the words "or such a rate of wages and hours as are equivalent or approximate thereto." The amendment was rejected by twenty-five votes to three, and the recommendation was adopted. Contractors who fail to comply with the covenant may be struck off the list of corporate contractors. The Watch Committee are to consider the desirability of arranging "the acceptance of contracts for such periods as will enable Liverpool tradesmen to compete on equal terms with those of other towns."

THE SIMPLON TUNNEL.

THE project of tunnelling the Simplon has at last taken definite form, and an official report has been issued by the Jura-Simplon Railway Company, of whose line, now terminating at Brigue, it would form an extension. It is proposed to start the boring for the tunnel, which is to be one of 12¼ miles—or three miles longer than that through the Gothard—on the northern side of the mountain at a height of 687 mètres just above Brigue. Thence it will rise at a gradient of 1·5 per cent. to 701 mètres at the centre of the tunnel, and then drop at an incline of 6·5 per cent. to the southern side, where the opening will be made upon Italian territory at a height of 634 mètres,

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near Iselle. This is but ten miles from Domo d'Osolla, the existing terminus of the Italian Mediterranean Company's branch, which runs thence to Novarra, Turin and Genoa. The cost of the approaches to the points proposed for the openings of the boring will, therefore, be comparatively small—170,000*l.* out of the 3,000,000*l.* which it is estimated the line would cost. An interesting feature of the project is the proposal to divide the tunnel at half distance. That is, from Brigue to the centre it will consist of a single boring large enough to receive a double line of rails ; then it will be divided into two smaller tunnels, running parallel, and each containing a single line of rails. This plan has been conceived as the best and most economical for ventilation purposes. An exhaustion shaft is to be made at the highest part of the boring, where the tunnel divides, and at which point the volume of smoke and obnoxious gases will naturally be greatest.

The mouth of one of the parallel tunnels will be kept closed except to allow of the passage of trains coming up from Iselle, whilst the mouth of the other tunnel, as well as that at the Brigue end, will be left open. In this way the engineers expect to obtain not only adequate but much cheaper ventilation than would be obtained by making a single tunnel. The Rhone on the Swiss side and two smaller rivers on the Italian side of the mountain will provide the motive power necessary for the air-pumps during the work of construction and subsequent working of the tunnel.

WESLEYAN CHAPEL, CROSBY.

THE Wesleyan chapel and school premises which have been in course of erection in Mersey Road, Crosby, Liverpool, during the past year, have attained completion. The amount of the contract for the works was 8,352*l.* 3*s.* 10*d.* The chapel is cruciform on plan, with wide nave, 70 feet by 41 feet ; transepts, 26 feet by 14 feet 6 inches ; octagon-ended chancel, 28 feet 6 inches by 21 feet 6 inches, with spacious organ-chamber, 22 feet by 16 feet, with large arched openings to both chancel and transepts. The principal entrance is approached from Mersey Road, and consists of an east and west porch, with a connecting narthex, the size of the narthex and porches being 55 feet by 11 feet. The tower and spire, 110 feet high, is placed at the north-east angle of the church, and forms one of the entrances. The north-west porch contains a staircase to gallery over the narthex. At the south-west angle of the church are the various classrooms, vestry and corridor connecting the church with the lecture-room at the south end of the site. The lecture-room is the same size as the old chapel removed from Great Crosby, the bold Norman doorways, east window, roof timbers and much of the material and masonry being reused in this part of the work. The size of the lecture-room is 53 feet by 30 feet. The room has four entrances, minstrels' gallery and spacious kitchen, fitted with every requisite for the purposes desired. The style of architecture adopted by the architect is the transitional period between Decorated and Perpendicular. The materials used in the erection of the edifice externally are Yorkshire stone shoddies and Storeton stone dressings. The roof principals are constructed with hammer-beams, and the spaces fitted with tracery deeply moulded, giving a very bold and rich effect to the interior of the church. This effect is assisted by the double arches to the windows in the various walls. The effect of the chancel is considerably heightened by the richness of the choir seats, the mosaic pavement in chancel and communion space, Caen stone arcading below the sills of the chancel windows, which are filled in with rich stained-glass. The carving has been the work of Mr. J. Rogerson, and the stained-glass and enriched grisaille work has been executed by Mr. J. A. Heaton. The mosaic work has been executed by Mr. G. Swift. The church will accommodate about 650 people. There are five spacious classrooms and vestries, with all necessary sanitary conveniences. The lecture-room will accommodate 300. Mr. J. F. Doyle was architect, and Mr. Webster, of Bootle, contractor.

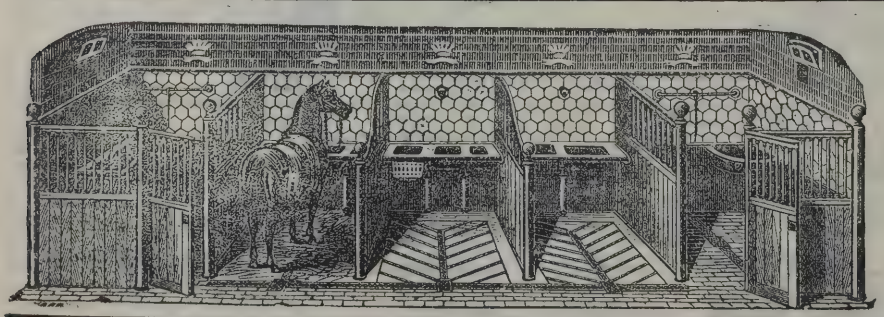
ARDROSSAN HARBOUR EXTENSION WORKS.

THE works in connection with the extension of Ardrossan Harbour, which have been in progress for the last four years, are now nearing completion, and it is expected that the new portion of the harbour will be opened for traffic within a few weeks. The works consist of a new dock of about 10 acres, a tidal basin about 5 acres in extent, and a considerable extension of the quay accommodation for passenger steamers and other traffic outside the docks, with a wide channel between the entrance to the harbour and the tidal basin. The whole extension is protected by a new breakwater about 1,400 feet long. All these works are nearly completed with the exception of a portion of the dredging which still remains to be done, and also a small piece of one of the quay walls, but with favourable

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weather it is hoped that everything will be sufficiently advanced to admit of the dock being opened for traffic in the course of a month or six weeks. The depth of water and width of entrance of the new dock are such as to enable the largest vessels employed in the class of traffic done at the harbour to make use of this port. The work has been divided into seven or eight contracts, including the general contract, hydraulic machinery and houses contracts, timber, pier and sewer contracts, &c., and the whole works have been carried out under the supervision of Messrs. Strain, Robertson & Thomson, civil engineers, Glasgow.

BUILDING AT EAST GRINSTEAD.

THE employment of bricks and mortar at East Grinstead just now is truly remarkable, says the *Sussex Daily News*, for the demand for houses of all descriptions appears to increase rather than to show any signs of ceasing. On all sides of the town extensive estates are being developed, and the foundations are scarcely laid before a house-hunter is on the scene to arrange for a tenancy with the owner. The transfiguration of the Chequer Mead Estate is watched with, perhaps, the greatest amount of interest, mingled somewhat with feelings of sorrow. The Chequer Mead has, since the memory of any living inhabitant, been the recreation-ground for the children of East Grinstead. Cricket and football have been played there, childish romps have been indulged in there, and it has always given harbour to the circuses and other peripatetic shows. People have come to look upon the Mead as their own property, and it has been divided by footpaths in all directions. But since it has been acquired by Mr. Steer from Lord Delawarr, the pleasant field, with its border of fine elms, has undergone a transformation, and is now crossed by three broad roads, which ere long will be lined with houses.

THE STRENGTH OF MATERIAL.*

IT is not usual to consider the work of the fireman as professional; but, nevertheless, in some respects it resembles that of the physician. When taken suddenly ill we telephone at once for a doctor, who, though a stranger, is expected to not only know the disease and its remedy, but also to understand the individual constitution of his patient, and recognise at once its weaker parts—those in which the disease is most likely to get beyond control; so the fireman, when called to action, is supposed to be able to recognise at a glance the weak points of a burning building, and at the same time discern all the natural channels it affords for fire; but, as fortune will have it, the mistakes of the doctors are buried, and those of the fireman are burned.

Engineers, with plenty of time for mathematical investigation, find it very difficult to determine with certainty which are the weaker parts of a building, and to ascertain positively their actual strength; how, then, can a person in a burning building determine in which part the fire can be fought safely and most successfully? The circumstances render imperative that this must be wholly a matter of judgment, therefore a few hints that are calculated to assist the judgment and render it more reliable will not be out of place here. It may be improved by cultivation and close observation, and for this purpose it may be well to fix in mind a few facts, and this may be done without taking a regular course in a technical school. In estimating the strength of different parts of buildings, it should be borne in mind that beams decrease in strength much faster than the length is increased. For instance, if a beam of any given size, 20 feet long, will sustain a load of 100 lbs. per foot, one of the same size and 40 feet long will sustain only 25 lbs. per foot, and that with much more deflection, while the same beam cut down to 10 feet in length would carry 400 lbs. to each foot in length.

With posts, the ratio of strength to their lengths differ somewhat with different materials and different proportions, but roughly speaking, posts of sizes in common use diminish in strength as they are increased in length in a ratio of about $\frac{1}{3}$ to 2—that is, if a post of a given size and 10 feet long is capable of supporting 12 tons, one of the same material and size, but 20 feet long, will support but 4 tons. The comparative strength of rods sustaining loads by suspension is not materially affected by their length; a long rod of a given size is nearly as strong as a short one of the same dimension.

Now with these general principles in mind let us remember as a base for calculations a few examples. Take first a mill 50 feet wide, three 10-feet storeys in height, of the usual "mill construction," centre posts and beams 8 feet between centres, making the beams 25 feet long from posts to wall. To safely carry the ordinary load of 100 pounds per square foot the beams

* A paper read by F. R. Richmond before the nineteenth annual Convention of Fire Engineers held at Springfield, Massachusetts.

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should be of Southern pine 12 by 16 inches, with round posts 11 inches in diameter or 10 inches square; posts in the first storey to support the second and third floor and roof; 10-inch round post or 9 by 9 in the second storey for the support of the third floor and roof, and 9-inch round or 3-inch square to carry the roof. A 15-inch I-beam 150 pounds per yard this length would be of about the same strength as the 12 by 16-inch beam. A 6-inch round wrought-iron column of $\frac{5}{8}$-inch shell or a 6-inch cast-iron column free from defects with a $\frac{1}{2}$-inch would be about the same strength as the 10 by 10-inch posts, cast-iron being stronger in columns than wrought-iron, except where they are very slender. Iron will not resist heat as long as wood, wrought-iron becoming soft and pliable and iron cracking with heat and water. If a brick pier is to carry the load or 10 by 10-inch posts it should be of good masonry 2 feet square, or at least 20 by 24 inches, and it will resist the action of heat longer than any other of the materials mentioned. A $1\frac{3}{4}$-inch iron rod will safely support by suspension the same amount of floor surface of a single floor as is carried by one of these posts.

If it is desired to use this building for a warehouse, to be filled with barrels of flour, it should be estimated at 400 instead of 100 lbs. to square foot, and it would require another row of posts between the centre post and each outer wall, thus making the beams about 12 feet between bearings, the beams remaining the same size and the post increased a little, the wood about 1 inch or $\frac{1}{2}$ inch for the iron.

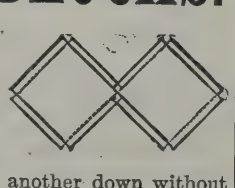
Now let us consider another type of building, a warehouse intended to be filled with flour making 400 lbs. per foot. Suppose the building to be 30 feet wide, and in height three storeys of 10 feet each, with joists running crosswise, and under them a centre beam running lengthwise of the building with posts to support this beam. The joists placed 10 inches between centres should be 4 by 14 inches and the beam supported with posts 10 feet apart should be 12 by 16 inches. The posts should be 12 by 12 in the first storey, 10 by 10 in the second and 3 by 3 to carry the roof. If cast-iron columns are used in the first storey they should be 7-inch diameter with $\frac{3}{4}$-inch shell, and wrought-iron of the same thickness shell should be 9-inch diameter and a well-built brick pier should be 2 feet 3 inches square. As brick piers are liable to split under heavy pressure they should have strong bond stones every 3 or 4 feet in height.

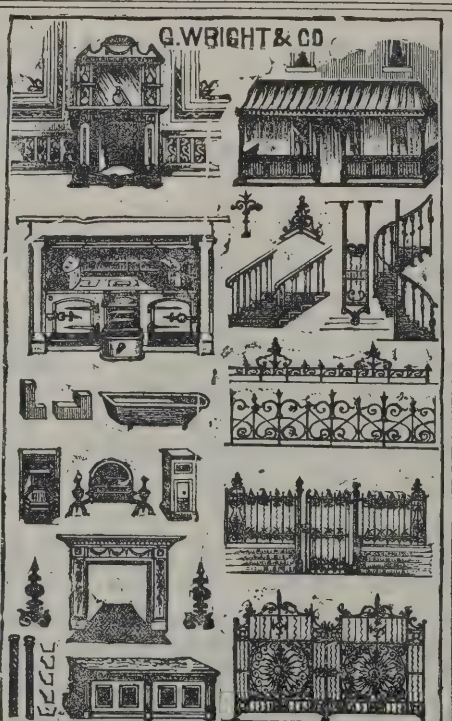
If the building as described above is to be loaded only 100 lbs. per foot, the joists would be $2\frac{1}{2}$ by 10, placed 18 inches between centres, the beam 10 by 12, and the first-storey posts 8 by 8 or 5-inch diameter $\frac{1}{2}$-inch shell iron column, the posts above 7 by 7 and 6 by 6. The timbers are all estimated for Southern pine, but if spruce is used instead it will safely carry about 4·5 as much load. Take a store 40 feet wide with a row of columns in the centre 12 feet apart and above the store four storeys of rooms to be used as offices or chambers. The joists should be 3 by 12, placed 16 inches between centres, and the columns should be 12-inch diameter if of Southern pine or oak, or if of cast-iron 7-inch diameter $\frac{3}{4}$-inch shell. If all the materials mentioned were free from defects and rightly set, it would require to break any of them about six times the load assigned to them.

The strength of brick walls is largely increased by buttresses, breaks, cross walls and other lateral supports, and decreased by openings, so that a thickness that would be very strong under some circumstances would be weak under others; but straight, solid, well-built walls commonly should be 12 inches thick in the two top storeys, 16 inches for the two storeys next below, 20 inches for the fifth and sixth from the top, 2 feet below these, so on, increasing 4 inches for each two storeys downward, and of course warehouses and buildings for heavy uses should have thicker walls, while ordinary partition walls built near together may be thinner. Arches in brickwork are very strong if sufficient provision is made for sustaining their thrust, but often the bottom of arches spreads and the brickwork above cracks, and too often solids are placed over openings with openings over solids, thus concentrating large loads on small portions of masonry, resulting in the cracking of the walls.

A $\frac{1}{2}$-inch rod may be safely relied upon to carry 1 ton; a 1-inch rod, 4 tons; a 2-inch rod, 16 tons, and a 3-inch rod, 35 tons, and, if of good quality, it would require six or seven times this to break them with a suitable truss to sustain the upper end. To discuss the strength and strains of different parts of the different styles of trusses would make too long an article for this place, but as a rule the weakest place in a truss is at the joint of the bottom of the braces to the tension cord. When a fireman is called to enter a burning building, he has no time to remember and apply all these figures, but by fixing these and others in his mind and improving his daily opportunities to estimate the strength of different buildings, searching out their weak points, he will acquire the habit of judging at sight the relative strength and safety of buildings, and cultivate his judgment so that it will be of great value in cases of emergency.

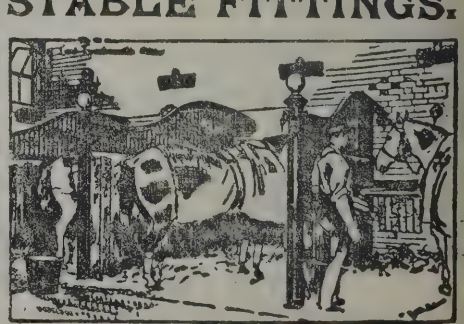
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BRISTOL MASTER BUILDERS' ASSOCIATION.

ON Saturday the president (Mr. E. T. Hatherly), Messrs. James, Scull and Cowlin (members of the Association), and Mr. Henry J. Spear (secretary), and Mr. Perry (the instructor of the plumbing class) attended the schools of the Society of Merchant Venturers for the purpose of adjudicating upon the work of the students during the past session. Two prizes were awarded to the following for the best sets of practical work executed in the school workshop—the first to John W. Holbrook, and the second to Francis J. Cann. The adjudication of prizes in the carpentry and joinery classes was deferred for a week.

AN AMERICAN TRADE SCHOOL.

THE following are the regulations of the trade school of the Pratt Institute, Brooklyn, N.Y. :—

Applicants must be between sixteen and twenty-five years of age. All tools and materials are furnished without extra charge. Day and evening classes.

Carpentry.—Practice is first given in the use of saws, planes, chisels and laying-out tools, and is followed by a thorough course in joint-work. After this practice, and when some mastery of the tools has been gained, a model of a frame-house is made and the different methods of framing illustrated. Afterwards partitions are set and bridged and floors laid. Door and window-frames are made and placed in the partitions, which are sheathed, clapboarded, shingled and corniced. Lastly, inside trimming is taken up ; doors, sashes and shutters are made and hung ; wainscoting, baseboards and stairs built, &c. Constant practice is given in the use of working drawings and in laying out work from plans.

Plumbing.—The plumbing shop is equipped for about fifty pupils, each member having a gas furnace for melting solder, and a drawer holding a set of tools. Instruction is both practical and theoretical, lectures being given from 8·30 to 9·30 o'clock every Wednesday evening. The manual work includes the use of tools, preparing wiping cloths, making soil, tinning soldering iron, brass, iron, lead and tin, making solder, soldering seams, making cup-joint, over-cast joint, straight wiped-joint, flange joint and branch joint, working sheet lead into bends, traps, service boxes and safes, lining tanks, calking iron pipe joints, and bending with sand and kinking irons. The lectures deal with the proper arrangement of drain, soil and waste pipes, trapping and ventilating the same, supply pipes, boilers, tanks, fixtures, pumps, and also explain mistakes in plumbing.

House and Fresco Painting.—The Master Painters' Association, of Brooklyn, co-operates in the direction of the painting classes, and at the end of the term examinations are held and certificates granted, with their approval. The equipment for the house-painting class consists of screens containing doors, windows and wainscoting, and, for the fresco workers, of booths, plastered on sides and ceiling, with varied forms of cove and cornice.

Blacksmithing.—The instruction includes care and management of fire, operations in drawing, upsetting, forming and welding iron, and making and tempering steel tools. The exercises mainly represent useful pieces of work and several complete designs in ornamental work finish the course.

Machine Shop (two years' course).—Bevel, surface and key-way chipping are first practised, after which the class is put upon straight-surface filing until ability to file straight and true is obtained. This is followed by straight, tongue, round and dovetail fitting, freehand filing, filing to templet, making calipers, square, bevel and gauges in sheet steel, use of taps and dies and practice in scraping. The toolwork gives practice on the engine-lathe in plain and taper-turning, outside and inside screw-cutting and fitting. After this, exercises are introduced in hand-turning, and varied practice on the planing-machine, shaper, drills, milling-machine and grinding-machine is obtained. The theory of cutting tools is analysed and the construction of the different machines explained.

Bricklaying.—The men are first taught to handle the trowel and to spread mortar. Practice is then given in building 8, 12 and 16-inch walls, with square and blocked ends, and with returned corner ; afterward, arches in walls of the same size are constructed, and later, flues, fireplaces, setting sills and corbelling. At first each man works on a separate section of the wall, and no attempt is made to do rapid work, but toward the end of the course a number of men are placed side by side on a long wall and greater speed is attempted. Instruction is given by means of lectures upon the strength of walls, theory of arches, properties and proportions of mortar, cement, &c.

Plastering.—Instruction is given in scratch-coating, laying off, browning and hard finishing, and in running and mitreing

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small mouldings and cornices. The booths for plastering are formed of stud partitions, lathed in the usual manner, and arranged to present the conditions of an ordinary room. The use of hawk and trowel is first taught, and the scratch-coat is then applied. This is afterwards taken off, and the walls are next covered by laying-off, and practice obtained in the use of darby and rod. After this practice in browning is given on the hard and dry scratch-coat, and this is followed by considerable practice in finishing with sand mortar to prepare for hard finishing. Running and mitreing simple cornices are taught last.

House Painting.—The house-painting course includes both elementary and advanced classes ; the former having practice in the preparation of surfaces, mixing paints, and plain painting on wood, brick and plaster surfaces ; and the latter in varnishing and hardwood polishing, polish white, gilding, lining, graining and paperhanging. Lectures are given on the harmony of colours, mixing of colours, proportion of oils and driers, and the various materials used in painting.

Sign Painting.—A special class in sign painting will be organised next year. The instruction will include preparation of surfaces, spacing and plain lettering, followed by ornamental lettering in gold and colours, and painting on glass and metal.

Fresco Painting.—Instruction is given preparing walls and ceilings for calcimine, in lining, laying out work, making and applying pounce and stencil, and in putting on flat and shaded ornaments.

Advanced Fresco Painting.—Applicants are admitted only on approval of some member of the Master Painters' Association, or after giving satisfactory proof of proficiency in plain fresco painting. Instruction is given by alternate practice in drawing and colouring designs in the art department, and in applying the same in fresco to the plastered wall.

THE IRON TRADE.

THE customers of the New British Iron Company, Corngreaves, one of the largest firms in the Midlands, have received circulars announcing an advance in the price of ordinary iron of 5*s.* per ton, with the usual differences on the firm's "cable" and other better qualities. This advance applies to bars, nail rods, &c. The Gas-tube Strip Iron Association have also resolved to give notice for an advance over the present prices of 5*s.* per ton, making the new quotation 6*l.* 10*s.* The notice will have to be considered by the National Tube Makers' Association, but there is not much probability that they will refuse the advance. Letters have been issued by Messrs. Roberts & Co., West Bromwich, withdrawing all quotations for bars and strips and similar iron, and other firms are taking like action. Producers of merchant iron are demanding 2*s.* 6*d.* to 5*s.* per ton rise on all orders, and merchants have no alternative but to pay it. Circulars are shortly expected from merchants, advancing prices 10*s.* per ton.

LIMESTONE INDUSTRY IN THE UNITED STATES.

THE United States Census Bureau has recently issued a bulletin showing the extent and value of the limestone industry in that country. It shows that ordinary limestone, to the value of 19,095,000 dols., was produced during the census year from 1,954 quarries, by a force of 30,644 men, who received in wages a sum amounting to 10,122,000 dols. The total expenses in producing the limestone amounted to 15,093,000 dols., giving a profit to the producers of 4,000,000 dols. The capital invested amounted to 27,022,000 dols., of which 14,771,000 dols. are invested in land. The various purposes for which limestone is used and the extent to which it is employed in the various industries, are shown in the following figures :—Building purposes, 5,405,671 dols. ; converted into lime, 8,217,015 dols. ; stone, for burning into lime, 184,000 dols. ; flux, for furnaces, 1,569,300 dols. ; street-work, 2,383,000 dols. ; bridge, dam and railroad work, 1,290,000 dols. ; and miscellaneous uses, 46,000 dols. In stating the amount of lime, the figures are limited to that manufactured by producers of limestone, and do not include lime produced by lime-burners, who purchase stone from quarrymen and burn it into lime. Limestone is produced in 39 States and two territories ; but nearly two-thirds of the value of the product is confined to seven States. These seven States are Pennsylvania, Illinois, Indiana, Missouri, New York, Maine and Ohio, and the value of the product in each is in the order of the States named. Pennsylvania heads the list with 373 quarries, and a production valued at 2,655,000 dols. Illinois comes next, with 104 quarries, and a product valued at 2,191,000 dols. ; Indiana, 172 quarries, value of product, 1,889,000 dols. ; Missouri, 123 quarries, value of product, 1,860,000 dols. ; New York, 157 quarries, value of product, 1,708,000 dols. ; Maine, 60 quarries, with a value of 1,523,000

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dols.; and Ohio, with 221 quarries, and a product valued at 1,515,000 dols. These are the only States in which the value of the product reaches 1,000,000 dols. annually. In Wisconsin the value is 813,963 dols.; Minnesota, 613,000 dols.; Iowa, 531,000 dols.; California, 517,000 dols.; Kansas, 478,822 dols.; Alabama, 324,814 dols.; and Kentucky, 303,314 dols. Maine heads the list in the value of lime produced; yet Pennsylvania produces more than twice the quantity produced in Maine. The main product comes entirely from Knox county, where large quarries of very pure limestone are worked exclusively for conversion into lime. Pennsylvania produces 4,043,679 barrels of lime, while the production of Maine is 1,903,639 barrels. The value of the Maine output is 1,523,499 dols., while that of Pennsylvania is only 1,195,955 dols. This great difference in the relative value of the product of these two States is accounted for by the fact that a large proportion of the lime produced in Pennsylvania is used for agricultural purposes, which require only inferior descriptions; whereas the lime from Maine is almost entirely used for building purposes in many of the principal cities on the Atlantic coast.

INSPECTION OF PLUMBING WORK BY PRACTICAL PLUMBERS.

THE Mayor presided at the last meeting of the Public Health Committee at Cork. Mr. Barry Galvin, the executive sanitary officer, said the following portion of the report of Mr. Constantine, registered plumber, who had been recently appointed by the Waterworks Committee to inspect the fittings of No. 2 Area, had been read at the meeting of that committee, and had been ordered to be brought before the Public Health Committee:—"Out of a total of 118 houses inspected, I should hesitate to pronounce more than 16 or 18 to be in a fair sanitary condition, and while the authorities permit such a state of things to exist, no effort of yours will succeed in materially reducing water waste, as the inhabitants, knowing no better, will persist in letting the water flow as the only method they know of to keep down the horrible effluvium arising from defective fittings."

Dr. Donovan, the medical officer of health, said the report of Mr. Constantine showed the necessity for having practical plumbers as sanitary inspectors. He suggested to the Public Health Committee that the next vacancy which occurred in the staff of sub-sanitary officers should be filled by a competent plumber, whose time would be well occupied in looking after the proper construction and repairs of the water-closets in the city. If this had been done earlier, a good many of the defects now found would not exist. They could not expect an outsider who was not a plumber to be able to supervise plumbing defects and get them remedied.

It was decided, after a lengthy discussion, that Dr. Donovan's suggestion should form the subject of a conference between the joint committees.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

15071. Thomas Duncan, for "Improvements in hand-saw holders or clips."

15083. Henri de Marneffe, for "An improved system of momentary stoppage of doors or bodies having too great an acceleration of speed."

15152. James Williams, George J. Williams and A. H. Williams, for "A wood door curtain rod."

15228. Alfred Frommhold and Frank Voigtmann, for "Improvements in draught regulators."

15259. Andrew Barr, for "Improvements in hinges or fastenings for windows."

15339. William Alfred Swain, for "A self-ventilating tap."

15461. Hugh Millar and Walter Thomson, for "An improved device for excluding draughts, applicable to doors, casement windows and the like."

15472. Franz Hurter, for "Improvements in roller-blinds."

15482. Theodor Heinrich, Johann Eskuchen and Hermann August Haarmann, for "Improvements in the manufacture of briquettes of purple ore."

15509. Gustav Dolenz, for "An improved process for the manufacture of artificial stone and marble."

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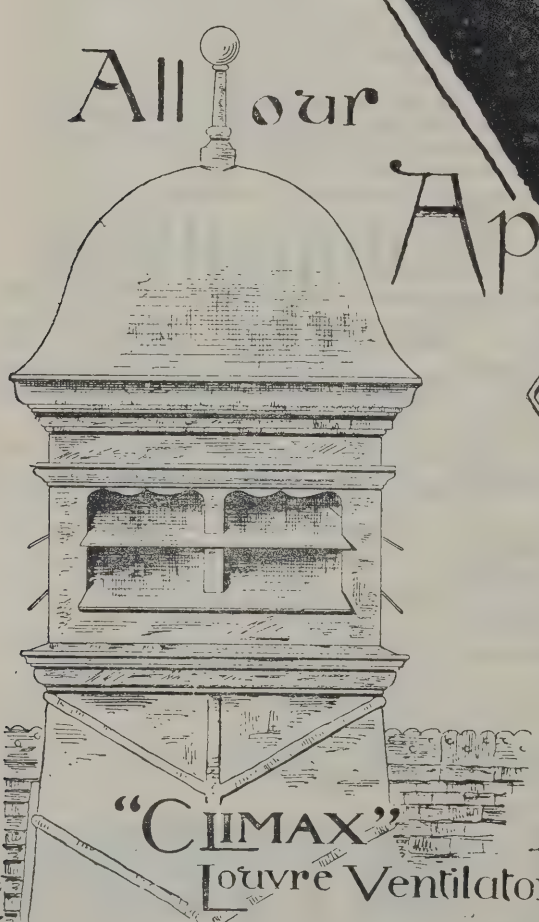
No 1 plain Design



No 2 plain Design

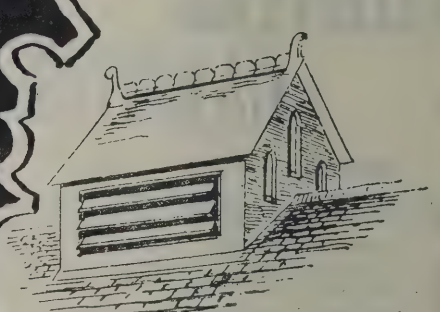
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Friday, September 25, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, OCTOBER 2, 1891.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

BATH.—Oct. 31.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

FESTINIOG.—Oct. 31.—For Plans and Estimates for Electric Lighting. Mr. R. Walker Davies, Solicitor, Blaenau, Festiniog, North Wales.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

MERTHYR TYDFIL.—Nov. 12.—For Plans for School Buildings. Mr. E. Stephens, School Board Offices, Merthyr Tydfil.

CONTRACTS OPEN.

ALDERSHOT.—Oct. 6.—For Supply of Broken Granite. Surveyor to the Local Board, Victoria Road, Aldershot.

ALNWICK.—Oct. 5.—For Constructing Drying Closet at the Laundry, Alnwick Union Workhouse. Mr. F. R. Wilson, Architect, Alnwick.

AMBLE.—Oct. 7.—For Building Premises for the Amble Co-operative Society. Mr. George Reavell, jun., Architect, Alnwick.

ASHFORD.—Oct. 8.—For Supply of Sixty Horse-power Steam Boiler Mr. C. D. Hume, District School, Ashford, near Staines.

BARNSLEY.—Oct. 8.—For Completing Arcade. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

BELFAST.—Oct. 5.—For Supply of Setts. Mr. T. R. Salmond, Engineer, Harbour Office, Belfast.

BLACKWALL.—Oct. 12.—For Constructing (by Compressed Air) and Maintaining Carriageway and Footway Tunnel under the River Thames. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

BRISTOL.—Oct. 16.—For Extension of Avonmouth Dock Mr. John M. McCurrick, Docks Engineer, Cumberland Basin, Bristol.

BURNLEY.—Oct. 13.—For Supply, Delivery and Erection of Sixty Tons of Cast-iron Girders. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

CAMBERWELL.—Oct. 5.—For Paving New Streets. Mr. Geo. W. Marsden, Vestry Hall, Camberwell, S.E.

CARDIFF.—Oct. 9.—For Alterations to Lavatories at Workhouse Hospital. Mr. A. J. Harris, Union Offices, Queen's Chambers, Cardiff.

CHAPELTOWN.—Oct. 9.—For Building Blocks of Houses, &c. Mr. Herbert Crawshaw, Architect, 1 Regent Street, Barnsley.

CLAPTON.—Oct. 5.—For Iron Staircase at Workhouse. Mr. F. W. Crane, 61 Bartholomew Close, E.C.

COLNE.—Oct. 6.—For Supplying and Fixing Heating Apparatus. Mr. John Mallinson, Architect, Colne Lane, Colne.

CORK.—Oct. 5.—For Building Memorial Ward at Infirmary. Mr. Arthur Hill, Architect, 22 George's Street, Cork.

COTEHILL.—Oct. 2.—For Building Two Gatekeepers' Houses. Mr. J. Williams, Secretary, Midland Railway Company, Derby.

COVENTRY.—Oct. 2.—For Building Premises. Mr. H. W. Chattaway, Architect, Coventry.

DEWSBURY.—Oct. 7.—For Supply of Cast-iron Socket Pipes. Mr. G. H. Hill, Albert Chambers, Albert Square, Manchester.

DOWNPATRICK.—Oct. 31.—For Constructing Waterworks. Mr. J. W. Montgomery, Union Offices, Downpatrick.

DURBAN.—Oct. 2.—For Supply and Delivery of Steel Tram Rails. Mr. W. H. Radford, C.E., Angel Row, Nottingham.

EASTBOURNE.—Oct. 13.—For Supplying Westminster Chiming Clock for the Town Hall. Borough Surveyor, Town Hall, Eastbourne.

EASTBOURNE.—Oct. 19.—For Constructing Sewers. Borough Surveyor, Town Hall, Eastbourne.

FELLING.—Oct. 7.—For Building Mechanics' Institute. Mr. H. Miller, Local Board Offices, Felling, near Newcastle.

FLIMBY.—Oct. 3.—For Building Premises. Secretary, Maryport Co-operative Society, Limited, Maryport.

FULHAM.—Oct. 7.—For Making-up and Paving Roads. Mr. W. Sykes, Surveyor, Town Hall, Walham Green.

GLASGOW.—Oct. 12.—For Building Three Tenements. The Town Clerk, City Chambers, Glasgow.

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ALL WORK GUARANTEED.

GRIMSBY.—Oct. 6.—For Building Workhouse. Mr. H. C. Scaping, Architect, Victoria Chambers, Grimsby.

HADLEIGH.—For Farm Buildings. Mr. A. Gordon, 101 Queen Victoria Street, E.C.

HALIFAX.—Oct. 9.—For Building Fire Brigade Station. Mr. James Farrar, Architect, Crossley's Buildings, Northgate, Halifax.

HALIFAX.—Oct. 12.—For Building Seven Houses. Messrs. Lloyd & Son, Architects, 24 George Street, Halifax.

HENDON.—Oct. 5.—For Kerbing, Tar Paving, &c. Mr. S. S. Grimley, Engineer, Local Board Offices, The Burroughs, Hendon, N.W.

HERNE HILL.—Oct. 5.—For Supplying and Erecting Cleft Oak Fencing at Brockwell Park, Architect of the London County Council, Spring Gardens, S.W.

HERTFORD.—Oct. 8.—For Repairing Roads. Mr. T. R. Dickinson, Borough Surveyor, Hertford.

HOVE.—Oct. 26.—For Electric Lighting. Mr. Charles A. Woolley, Town Clerk, Town Hall, Hove.

KENSINGTON.—Oct. 6.—For Supply of Thames Ballast. Mr. W. C. Leete, Town Hall, Kensington, W.

LEAMINGTON.—Oct. 12.—For Supply of Broken Granite. Mr. H. C. Passman, Town Clerk, Leamington.

LONDON.—Oct. 5.—For Supply of Bricks, Cement, Stone, Fencing, Engine and Carriage Springs, &c., Great Western Railway. Mr. J. D. Higgins, Paddington Station, W.

LONDON.—Oct. 5.—For Supply of Gravel, &c., to Victoria Park and Battersea Park. Architect of the London County Council, Spring Gardens, S.W.

LONDON.—Oct. 5.—For Pulling Down and Purchasing Building Materials. Works Department, School Board for London, Victoria Embankment, W.C.

LONDON.—Oct. 10.—For Building Municipal Lodging-house. Messrs. Gibson & Russell, Architects, 27A Old Bond Street, W.

LUDLOW.—For Building Granary and Corn Store. Mr. W. W. Robinson, Architect, King Street, Hereford.

LUTON.—Oct. 6.—For Supply of Broken Granite, Slag, Flints, Paving Stone, &c. Mr. E. J. Lovegrove, Borough Surveyor, Town Hall, Luton.

MARGAM.—Oct. 10.—For Building Iron Girder Bridge. Mr. Wm. Thomas, Surveyor, Port Talbot, South Wales.

MELTON.—Oct. 16.—For Works for Supply of Water to County Asylum. Mr. Geo. Hodson, Abbey Buildings, Prince's Street, Westminster, S.W.

MERTHYR.—Oct. 7.—For Erecting Platform Covering at the Great Western Railway Station. Mr. J. D. Higgins, Paddington Station, W.

MILE END.—Oct. 15.—For Erecting Iron Balconies, Stairs, &c. Mr. Charles F. Burden, Mile End Workhouse, Bancroft Road, E.

NEWTON-LE-WILLOWS.—Oct. 17.—For Building Public Hall and Offices. Mr. Thomas Beesley, Architect, Bold Street, Warrington.

RAMSGATE.—Oct. 21.—For Constructing Sloping Road, Brick and Concrete Arches, Sea Wall and New Military Road. Mr. William A. Valon, Engineer, Hardres Street, Ramsgate.

ROCHESTER.—Oct. 13.—For Building Four Cottages. The City Surveyor, Guildhall, Rochester.

ROCHESTER.—Oct. 14.—For Supply of Cast-iron Pipes. Mr. Richard Prall, Town Clerk, Eastgate, Rochester.

ROMFORD.—Oct. 3.—For Supply of Broken Granite. Mr. A. H. Hunt, Local Board Offices, Romford.

ROTHERHITHE.—Oct. 5.—For Build ng Two Rooms and Bathrooms at South Wharf, for the Metropolitan Asylums Board. Mr. Charles Thomson, South Wharf, Rotherhithe.

ROTHES.—Oct. 2.—For Laying Pipes with Concrete Cisterns, Mr. J. Smith, 10 Seafield Square, Rothes.

SHEFFIELD.—Oct. 2.—For Constructing Pipe-Sewer and Storm-water Overflow. Mr. G. Halsing, Engineer, 81 Norfolk Street, Sheffield.

SWANSEA.—Oct. 5.—For Constructing Pipe-sewer. Borough Engineer, Guildhall, Swansea.

SWINDON.—Oct. 10.—For Taking-down and Rebuilding 22 Wood Street. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

TAUNTON.—Oct. 5.—For Supply and Erection of Electrical Fire Calls. Waterworks Manager, Municipal Buildings, Taunton.

TOTTENHAM.—Oct. 6.—For Kerbing and Paving. Mr. J. E. Worth, Coombes Croft House, High Road, Tottenham.

WILTON.—Oct. 6.—For Supply of Gravel and Stones for Repair of Roads. Mr. G. M. Wilson, 12 Bridge Street, Salisbury.

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WINCHESTER.—Oct. 7.—For Building Waiting-rooms and Footbridge, and for Paving Platforms at the Great Western Railway Station. Mr. J. D. Higgins, Paddington Station, W.

TENDERS.

AYR.

For Rebuilding Harbour Wall from the New Bridge to the Queen's Hotel, Ayr. Mr. MURDOCH, C.E.

W. Clark, Ayr	£1,150 0 0

CARDIFF.

For Constructing Temporary Slaughter-house, Mortuary, &c., for the Local Board, Barry.

Slaughter-house.

J. Lysaght	£139 0 0

Mortuary, &c.

Lysaght	96 0 0

For Improvement Works, Penarth Road, Cardiff.

T. HARRIS, Roath (*accepted*)	£929 11 2

CROYDON.

For Interior Distempering, Painting, Cleaning and Repairs at Infirmary, Mayday Road, Croydon, for the Guardians. Mr. FREDERICK WEST, Surveyor, Coombe Road, Croydon.

G. Smith, Hammersmith	£850 0 0
T. Coward, Streatham	650 0 0
Martin & Co., Croydon	560 0 0
W. Dudley, New Southgate	499 7 0
Gardner & Llewellyn, Croydon	497 0 0
Umlandt & Nicholl, Croydon	430 0 0
AKERS & Co., South Norwood (*accepted*)	397 0 0

GELLIGAER.

For Laying Pipes and Constructing Sewage Works at George Inn, Gelligaer, for the Merthyr Tydfil Rural Sanitary Authority. Mr. JAMES JONES, Surveyor, High Street, Cefncoed, near Merthyr.

T. Evans	£346 6 8
T. Evans	335 10 0
Watkins & Lewis	227 15 0
T. JONES, Tir Phil (*accepted*)	188 10 0

EASTBOURNE.

For Laying Glazed Stoneware Pipe Sewer, with Manholes, Ventilators, &c., for the Highways and Drainage Committee. Mr. CHAS. TOMES, Borough Surveyor, Eastbourne.

C. P. Dennis, Eastbourne	£337 0 0
J. HAYWARD, Eastbourne (*accepted*)	257 17 0

FLOCKTON.

For Laying Water Pipes, &c., in connection with the Flockton and Upper Whitley Water Supply. Mr. W. J. WOOD, Engineer, Flockton.

Spooner, Booth & Co., Holmfirth	£1,679 8 2
T. Bell, Market Weighton	1,652 8 0
W. Radcliffe & Co., Huddersfield	1,613 17 6
Parkinson & Bower, Halifax	1,479 15 2
S. Burnley, Flockton	1,468 12 11
Snowden & Son, Ossett	1,465 8 0
J. Balmforth, Elland	1,368 7 10
J. & T. Young, Wakefield	1,211 5 0
H. Wilson, Great Horton	1,189 6 6
DOLEMAN & BOOTH, Dewsbury (*accepted*)	1,031 18 4
Bentley, Swift & Co., Kirkheaton	1,011 4 0
J. Gott, Preston	993 15 8

HALIFAX.

For Forming Ground for the Greetland Cricket Club.

L. Goodfellow, Halifax	£30 0 0
Beaumont & Waterfall, Elland	30 0 0
T. Wilson, Halifax	27 10 0
J. Fairburn, Wyke	26 10 0
J. Crossley, Halifax	25 0 0
W. BLACKBURN, Greetland (*accepted*)	20 0 0
T. Sykes, Lightcliffe	17 10 0

HARWICH.

For Supplying Sixteen Horse-power Cornish Boiler, with Mountings, &c., complete, for the Council. Mr. H. DITCHAM, Borough Surveyor, Harwich.

J. Thompson, Wolverhampton	£225 0 0
Stanford & Co., Colchester *	205 0 0
E. R. & F. TURNER, Ipswich (*accepted*)	200 17 0
Davey, Faxman & Co., Colchester *	200 0 0
Ruston, Proctor & Co., Lincoln *	175 0 0
W. H. Wood & Co., Cradley Heath *	150 0 0

* For boiler f.o.r. at Harwich ; no brickwork. Others include fittings and brickwork complete.

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KINETON.

For Erecting School Buildings, for the Managers of the Kineton National Schools. Mr. FRANCIS P. TREPESS, Architect, Warwick. Quantities not supplied.

Fleming, Gaydon	£1,250 0 0
Killer, Wellesbourne	948 0 0
HANCOCK, Kineton (*accepted*)	860 0 0
Talliss, Warwick (*withdrawn*)	780 0 0

LEEDS.

For Grand Stand for the Committee of the Bramley Football Club, Leeds.

Eddison Bros., Kirkstall	£185 0 0
M. Eland, Stanningley	178 0 0
J. E. Pearson, Burley Fields	156 10 0
DIXON BROS., Gamble Hill, Bramley (*accepted*)	131 0 0
W. Jordan, Bramley	105 0 0

LEYTONSTONE.

For Painting School Blocks, for the Guardians of West Ham Union.

G. Laver, Upton Manor	£244 0 0
H. S. Martin, Forest Gate	198 0 0
Kemp, Leytonstone	185 16 6
White, Forest Gate	165 0 0
D. Berry, Stratford	148 0 0
T. Humphreys, Stratford	143 0 0
S. COOLBEAR, Stratford (*accepted*)	142 10 0

LONDON.

For Alterations and Improvements to 14 Baker Street, for Messrs. Moss Bros. Messrs. J. HILL & CO., Architects.

D. BAKER (*accepted*)	£138 0 0

For Two Furnaces in Connection with Destructor at Mile End Dust Wharf, for the Vestry of Mile End Old Town. Mr. J. M. KNIGHT, Surveyor.

Brickwork.

W. Neil	£508 0 0
S. W. HAWKINGS, Mile End (*accepted*)	231 0 0

Ironwork.

J. Fraser & Son	192 10 0
T. & W. COLE, Mile End (*accepted*)	175 0 0

LONDON—*continued.*

For Alterations and Additions to No. 26 Upper Marylebone Street. Mr. J. H. WATSON, Architect.

Garner	£1,495 0 0
Bainford	1,450 0 0
Erridge	1,384 0 0
Stevens	1,277 0 0
Baker	1,260 0 0
Perkins	1,237 0 0

For Building Board School for 803 Children, Grove Street, Deptford. Mr. T. J. BAILEY, Architect.

		If Brickwork be built in Cement add
Willmott & Sons	£19,627 0 0	£655 0 0
W. Downs	18,049 0 0	279 0 0
Killby & Gayford	18,020 0 0	317 0 0
Kirk & Randall	17,879 0 0	342 0 0
Holloway Bros.	17,808 0 0	335 0 0
Hobbs & Co., Ltd.	17,540 0 0	—
Treasure & Son	16,999 0 0	257 0 0
Hart Bros.	16,947 0 0	321 0 0

For Building Board School for 803 Children, Bird-in-Bush Road. Mr. T. J. BAILEY, Architect.

		If Brickwork be built in Cement add
Killby & Gayford	£17,864 0 0	£329 0 0
Foster & Dicksee	17,764 0 0	352 0 0
H. Lovatt	17,621 0 0	425 0 0
Lathey Bros.	16,783 0 0	437 0 0
Treasure & Son	16,758 0 0	276 0 0
Hobbs & Co., Ltd.	16,634 0 0	381 0 0
Hart Bros.	16,567 0 0	325 0 0
Holloway Bros.	16,367 0 0	436 0 0

For Building Board School for 805 Children, Kemsing Road, Halstow Road, Greenwich. Mr. T. J. BAILEY, Architect.

		If Brickwork be built in Cement add
Hobbs & Co., Ltd.	£18,406 0 0	£243 0 0
H. Lovatt	18,198 0 0	331 0 0
S. & W. Pattinson	18,030 0 0	221 0 0
Holloway Bros.	17,310 0 0	460 0 0
Treasure & Son	16,753 0 0	147 0 0
W. H. Lorden & Son	16,440 0 0	441 0 0
Kirk & Randall	16,354 0 0	406 0 0

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The Moore & Burgess Minstrels
The Tivoli Theatre
Junior United and other Clubs
The Langham Hotel
Hotel Windsor, and others
The Café Monico
Baron de Rothschild's
Sir David Salomons
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LONDON—*continued.*

For Enlargement of Board School, Holmes Road, Kentish Town, by 511 Places, new W.C.'s, additional Playground, improving Lighting, &c. Mr. T. J. BAILEY, Architect.

		If Brickwork be built in Cement add
Gregar & Son	£17,498 0 0	£330 0 0
Willmott & Sons	17,375 0 0	375 0 0
Holliday & Greenwood	16,983 0 0	293 0 0
Foster & Dicksee	16,705 0 0	182 0 0
Grover & Son	16,427 0 0	275 0 0
F. J. Coxhead	16,213 10 10	248 19 4
C. Cox	16,100 0 0	280 0 0

For Superstructure in Extension of Offices for the School Board for London. Mr. ROBERT W. EDIS, F.S.A., Architect.

Messom	£49,750 0 0
Boyce	47,620 0 0
Forster & Dicksee	47,161 0 0
HIGGS & HILL (*accepted*)	46,940 0 0
Lawrance & Son	46,803 0 0
Walker & Slater (*withdrawn*)	38,000 0 0
Mowlem & Co.	—
Patman & Fotheringham	—
Colls & Sons	—

Messrs. Mowlem & Co. and Patman & Fotheringham declined to tender on account of strike. Messrs. Colls & Son sent no letter. The Board accepted the tender of Messrs. Higgs & Hill, of Crown Works, South Lambeth Road, for executing the concrete foundations for the enlargement of the head offices of the Board.

For Structural Improvements, &c., at Board School, Orchard Street, Hackney.

		If Brickwork be built in Cement add
Garrett & Son	£3,050 0 0	£20 0 0
G. J. Kick	2,731 6 0	—
W. Neil	2,672 0 0	25 0 0
T. McCormick & Sons	2,549 0 0	10 0 0

For New Drainage and Other Works at 6 Gloucester Place, Hyde Park, for Mr. D. H. Marrable. Messrs. BROWN & PRITCHETT, Architects, Limpsfield, Surrey.

J. H. Jolliffe	£320 0 0
G. ARTHUR, Kentish Town (*accepted*)	290 0 0

LONDON—*continued.*

For Additions to 20 Finsbury Pavement. Mr. C. A. WINTER, Architect, 19 Finsbury Pavement.

J. H. Mollett, New Bridge Street	£763 0 0
Hunt	724 0 0
Row Bros., Camden Town	695 0 0
Kenwick	660 0 0
Malvin	630 0 0
Chinchin	620 0 0
Minter	598 0 0
Jones & Groves	590 0 0
Neil, Finsbury Pavement	577 0 0
Edwards	525 0 0
Blandford	495 0 0
Sorell & Co.	483 0 0
Lukes & Hooker, Blackfriars	465 0 0
Channing	459 0 0

For New Drainage and Other Works at 42 Ladbroke Road, for Mrs. Marrable. Messrs. BROWN & PRITCHETT, Architects, Limpsfield, Surrey.

J. H. JOLLIFFE, Kensington (*accepted*)	£132 0 0

MALDON.

For Repairs, &c., Knowles Farm, Maldon, Essex. Mr. W. J. WOOD, Architect, 1 Finsbury Circus, E.C., and Southend.

Dines & Son	£66 14 6
J. Gozzett, Maldon	55 0 0

Sanitary works in addition to above.

NORWOOD.

For Extension and Enlargement of Infirmary at Schools, West Norwood, for the Guardians of Lambeth. Mr. SIDNEY R. J. SMITH, A.R.I.B.A., Architect. Quantities supplied.

J. Allen & Sons, Kilburn	£2,650 0 0
H. C. Adams, West Norwood	2,459 0 0
J. Holland, Poplar	2,397 0 0
B. E. Nightingale, Albert Embankment	2,394 0 0
F. Stevens, East Grinstead	2,358 0 0
F. & H. F. Higgs, Loughborough Junction	2,350 0 0
Waddington & Co., Sydenham	2,292 0 0
M. McCarthy, Chelsea	2,275 0 0
Wallis Bros., Norwood	2,236 0 0
W. Akers, South Norwood	2,195 0 0
Somerford & Son, Clapham	2,182 0 0
Jackson Bros., Gunnersbury	2,095 0 0
A. M. DEACON, Norwood (*accepted*)	2,021 0 0

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J. Waller, plastering.
G. Armstrong, plumbing.
J. S. Armstrong, Workington, painting and glazing.
Cost about £3,000.

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For Alterations to the Girls and Infants' Departments at the Industrial Schools, Plashet, Essex, for the Guardians of St. George-in-the-East. Messrs. WILSON, SON & ALDWINCKLE, Architects, 1 Victoria Street, Westminster, S.W.

T. Brightmore	£520 0 0
T. White & Son	485 14 0
J. Holland	484 0 0

RICHMOND.

For Alterations and Additions to Faircroft, King's Road, Richmond, Surrey, for Mr. P. Steinmann. Mr. W. J. WOOD, Architect, 1 Finsbury Circus, E.C., and Southend-on-Sea. Quantities by Messrs. Bushell & Crosier, 1 Finsbury Circus, E.C.

Parslow, Norbiton	£630 17 6
Jarvis, Surbiton	630 0 0
Lillywhite, Richmond	620 0 0
Lansdown & Co.	614 0 0
Piller & Son, Teddington	527 0 0
T. SAYERS, Brockley (*accepted*)	460 0 0

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For Addition to Woolpits, for Mr. J. E. De Verian. Messrs. BROWN & PRITCHETT, Architects, Limpsfield, Surrey.

English	£560 17 0
G. ARTHUR, Kentish Town (*accepted*)	475 0 0

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For Alterations to Methodist Chapel, Seaton Burn. Mr. J. G. CRONE, Architect, 50 Grainger Street, Newcastle.

J. Fynes, Killingworth	£94 0 0
A. GRAY, North Gosforth (*accepted*)	89 0 0

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For House and Offices at Southend-on-Sea, for Dr. Morris. Mr. W. J. WOOD, Architect, 1 Finsbury Circus, E.C., and Southend. Quantities by Messrs. Bushell & Crosier, 1 Finsbury Circus, E.C.

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West, Chelmsford	1,293 0 0
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Baker & Wiseman, Southend	1,267 0 0
Woodhams, Southend	1,262 0 0
Dupont, Colchester	1,249 0 0
Gozzett, Maldon	1,246 0 0

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For Taking-up 12-inch Sewer, Harton Village, and Replacing with 15-inch Sewer at a Lower Level and other Works, for the South Shields Union Rural Sanitary Authority. Mr. J. H. MORTON, Surveyor, King Street, South Shields.

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W. Allison, Whitburnsland	137 7 0
W. Wilson, South Shields	133 0 0
J. Hornsby & Sons, South Shields	131 0 0
M. D. YOUNG, Hebburn (*accepted*)	126 9 0
W. Shanks, Acklington	104 7 0

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For Additions to High Street School, for the School Board. Mr. S. TREVAIL, Architect, Truro.

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J. Collier, Truro	532 0 0
T. J. Richards, St. Stephen's	500 0 0
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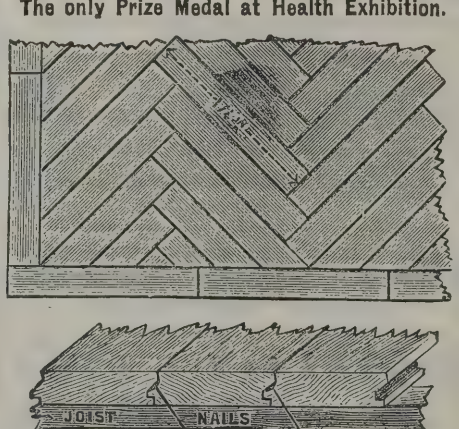
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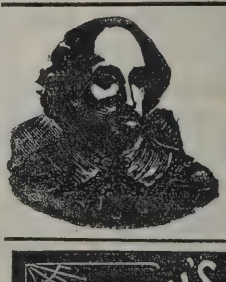


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Noiseless Outlet Ventilator.



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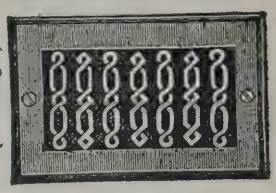
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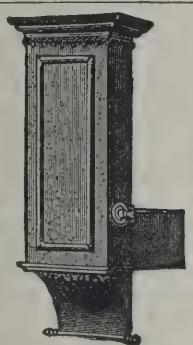
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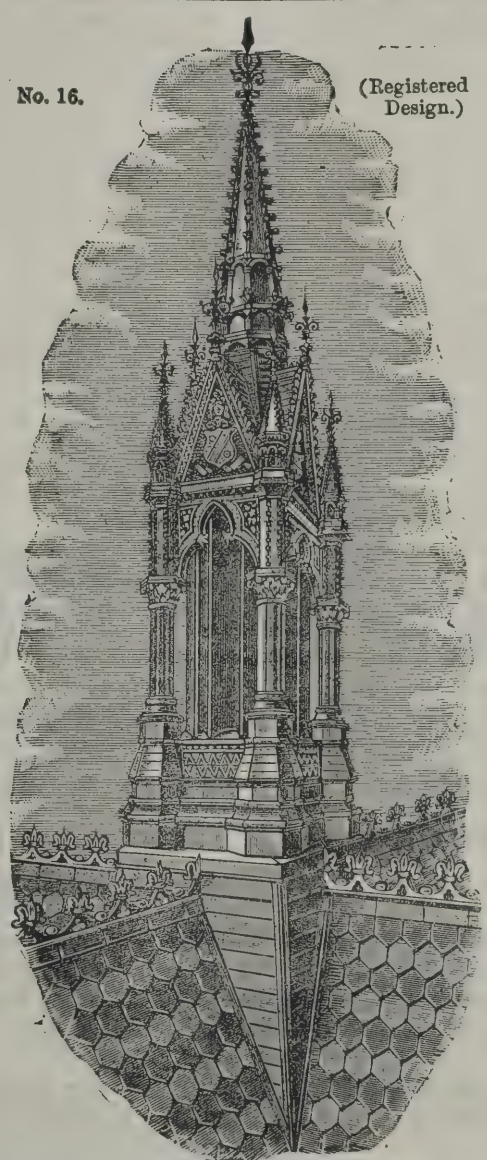


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Ornamental Bracket Pattern.



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„ 14 „	.....	5 to 7 „	..	1	17	6	„ 24 „	.....	9 to 12 „	..	5	5	0	„ 42 „	.....	16 to 20 „	..	11	17	6
„ 16 „	.....	6 to 8 „	..	2	12	6	„ 27 „	.....	12 to 14 „	..	6	7	6	„ 48 „	.....	18 to 24 „	..	16	15	0
„ 18 „	.....	7 to 9 „	..	3	5	0	„ 30 „	.....	13 to 15 „	..	7	10	0	„ 54 „	.....	20 to 27 „	..	19	0	0

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T. Green, Blackfriars, London	350	0	0
Aveling & Porter, Rochester	330	0	0
Wallace & Stevens, Basingstoke	320	0	0

Acceptance deferred.

TOTNES.

For Alterations to Stables and Coachhouses, New Dairy and other Works, at the Royal Seven Stars Hotel, Totnes, for Mr. J. Templeton. Mr. W. M. TOLLIT, Architect, 10 High Street, Totnes.

F. W. Vanstone, Paignton	£333	0	0
W. H. Goodridge, Totnes	286	0	0
Reeves & Selwood, Totnes	274	0	0
Rabbich & Brown, Paignton	250	0	0

WARRINGTON.

For Building Chapel, Crossfield Street, Warrington.

T. Spencer, Southport	£825	0	0

WHITBY.

For Building Three Houses, Chubb Hill Road, for Captain Gaygill. Mr. R. LENNARD, Architect, Clifford Street, Whitby.

C. Winterburn	£1,508	0	0
J. BAIRN (*accepted*)	1,328	0	0
Joiner.			
COVERDALE & LONGHORN (*accepted*)	540	0	0
Plumber.			
E. SMITHSON (*accepted*)	225	0	0
Painter.			
C. GREENBURY (*accepted*)	40	0	0

TRADE NOTES.

THE work of illuminating Studley Royal, the Yorkshire seat of the Marquis of Ripon, with the electric light has been successfully completed under Mr. S. Harrison, engineer, by Messrs. Woodhouse & Rawson United, electrical engineers.

THE *Irish Times* says:—It is gratifying to observe, from the reports of the meeting and exhibition of work of the British Institute of Coach Builders which was held at Derby last week, that Irish artists and workmen still take a leading place in the important work of heraldic painting. At this exhibition, in the class which provides for the painting of an heraldic device upon a carriage panel, Mr. Alfred E. Stone, of Clonliffe Road, who for many years has been connected with the well-known firm of John Hutton & Sons, of Summer Hill, gained first prize for the exhibit submitted by him, the design being the coat of arms and armorial bearings of Lord Zetland. It has been decided to send the panel to Melbourne for exhibition.

THE Edinburgh Corporation have commissioned Mr. Howden, marine engineer, Glasgow, to prepare an estimate of the probable cost of a destructor with the application of his hot blast system.

THE new schools, Walshaw, near Bury, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

A FINE large clock has been erected in the new tower of the parish church at Lymm. Out of tenders from the principal clockmakers in England, that of Messrs. William Potts & Sons, of Leeds, was selected. The clock is constructed from the designs of Lord Grimthorpe. It has the double three-legged gravity escapement, compensation pendulum and all latest improvements. The hours are struck upon the tenor bell of the peal, which weighs 30 cwts., by a hammer of about 70 lbs., which is raised by steel-faced cams from the large wheel. The clock also strikes the full Cambridge or Westminster four quarters upon the second, third, fourth and seventh bells. It has one external dial of 5 feet 6 inches in diameter, which is of an ornamental character, made from the designs of the architect of the new tower. It is of skeleton form, so that the stonework can be seen through it, and forms the background. The dial is made of cast copper of great thickness, fitted together in sections and along with the hands is thickly gilded. The clock was started by the donor, Miss Fox, in the presence of a numerous assembly, including Mr. James Potts, of Leeds (representing the makers of the clock), and Mr. Taylor, jun. (the bellfounders), and a large congregation. Messrs. Potts & Sons, Leeds, the manufacturers, have made many of the most important clocks in the country, amongst which may be mentioned the Town Hall, Preston; Town Hall, Bolton, which has four dials 12 feet each in diameter and strikes the hours upon a bell of 4 tons; Rochdale Town Hall; Manchester Central Station, two dials 12 feet each in diameter; Dewsbury

Awards—Gold Medal, Saltaire, 1887; Silver Medal, Brussels, 1888; Silver Medal, Paris, 1889; Gold Medal, Brighton, 1889

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We feel confident that our **DESIGNS**, as well as our system of Lighting and Ventilating will commend themselves to all who are interested in having BRILLIANTLY LIGHTED and WELL-VENTILATED ROOMS.

A visit to our Show Rooms will be esteemed a favour. If inconvenient to call, send for one of our Illustrated Catalogues, inspect our Designs, and read our Testimonials.

Trusting to receive your favours, which shall have our prompt attention,
We remain, Gentlemen, yours obediently, **J. H. PICKUP & CO.**

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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Portable Cistern Filters.



157 STRAND, W.C. (Four Doors from Somerset House), LONDON.

Town Hall; Wakefield; Sunderland; Burnley; Lincoln Cathedral, which strikes the hours upon the large bell (Big Tom), 5 tons, 8 cwts., and is considered one of the finest and most accurate timekeeping clocks in England. The firm has also made many others for different parts of the kingdom and abroad.

NEW iron and steel works have been opened at Wishaw by the Belhaven Iron and Steel and Patent Nail Company, Limited, on a site adjoining the company's nail works. Ten puddling furnaces, two heating furnaces and three rolling mills have been laid down, together with other modern appliances used in the manufacture of iron and steel. Plates, strips and bars will be turned out for the home and foreign trade, and bevelled strips will be supplied to the nail works. The start has been made with nearly fifty hands. When fully occupied, the works (inclusive of the nail department) will give employment to 300. The cost of building, plant, &c., is estimated at 30,000*l.*

TERMS have been adjusted for a settlement of the dispute between Aberdour and Inverkeithing as to their water-supply. It is proposed that the present litigation be superseded; that it be remitted to Mr. R. Carstairs Reid and Mr. J. D. Parker, two of the skilled witnesses, to determine what new works or alterations upon the present works ought to be executed for the purpose of securing to both parties a full and adequate supply of water, and that the whole expenses of the works to be so determined and also the expenses incurred by both parties in the litigation be borne mutually in the proportion of seven-tenths by Inverkeithing and three-tenths by Aberdour.

THE Dundee Gas Commissioners have appointed a London firm of electrical engineers consulting engineers in connection with the installation of electric lighting in the city. The works, which are to cost about 20,000*l.*, are to be proceeded with at once.

A LARGE turret-clock has just been completed by Messrs. Gillett & Johnston, clockmakers and bellfounders, of Croydon, at the fire station, Chiswick. The clock is constructed to strike the hours on a bell and shows the time on four illuminated dials, each measuring 3 feet 6 inches in diameter. It is made of the best materials and workmanship, and has all the latest improvements. The same makers have also just finished a large clock at the parish church, Farnham Royal, Bucks. The clock is of best materials, and has all latest improvements to insure perfect timekeeping. It has all gunmetal wheels, solid steel pinions, &c., and is fitted with the double three-legged gravity escapement and compensated pendulum. The clock is constructed to strike the hours and show the time on two dials. Messrs. Gillett & Johnston are now engaged on a large clock, carillon machine and peal of bells for Largs U.P. Church, N.B., to the order of Mr. John Clark, of Paisley. They have also in hand large clocks for St. Philip's, Kensington; Newnton Longville parish church; Coniston parish church; Rathkeale Church, co. Limerick; Karachi clock tower, India, &c., and are rehanging the bells at Tetbury Church, Gloucestershire.

FOR warming the new portion of the premises of St. Olave's Union, Rotherhithe, sixteen of Mr. John Grundy's patent warm-air ventilating fire-grates have been specified.

THE Wood-Block Flooring Company have removed from 22 Charing Cross, S.W., to Mansion House Chambers, 11 Queen Victoria Street, E.C.

NEW premises have just been erected in Oxford for the Metropolitan and Birmingham Banking Co. The whole of the plastering has been carried out by the Adamant Co., of Commercial Street, Birmingham, their patent adamant plaster having been used throughout the building.

THE Shardlow Guardians lately advertised an open competition for the best scheme for the sewerage and sewage disposal of Castle Donnington. Mr. W. H. Radford, C.E., of Nottingham, has just been awarded the first premium, and a vestry meeting of the ratepayers will shortly be held to consider the desirability of carrying out the scheme at once. The population is about 2,500, and it is proposed to deliver the sewage by gravitation on to 10 acres of suitable land, where it will be purified by irrigation. The storm water from roads will not be admitted to the sewers. Part of the outfall sewer will consist of an iron pipe syphon 750 yards long. The cost of the engineering works is estimated at 2,300*l.*

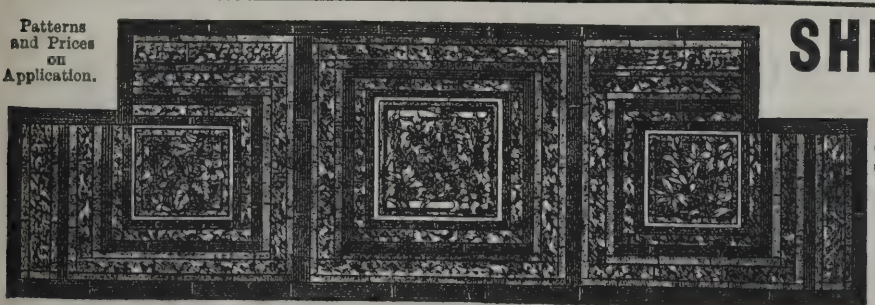
THE *Aberdeen Press* says that Harpers, Limited, Albion Iron Works, have acquired from the Aberdeen Land Association six acres of ground on the farm of Craiginches, Nigg, opposite the loading bank of the Caledonian Railway, and with a frontage of 900 feet to the public road, for the purpose of erecting new and extensive works.

AT a special meeting the County of Zetland Road Board at Lerwick had before them the appointment of a road surveyor for the county. There were over fifty applicants for the office. Mr. Alexander Ross, Aberdeen, was appointed. A report was submitted, showing that in order to provide a proper system of

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roads throughout the county an expenditure of something like 15,000*l.* or 20,000*l.* would be required. The meeting agreed to recommend to the County Road Trustees the construction of twenty-two new roads in various parts of the county at a cost of between 6,000*l.* and 7,900*l.*

WITH reference to the notice issued by the Foreign Office respecting tenders for the new pier at Yokohama, persons wishing to tender for the work are informed that further papers —including drawings—can now be seen at the Commercial Department of the Foreign Office, S.W., between the hours of 11 and 5.

TENDERS will be received by the Mayor of Galatz for the construction of tramways in that town, up to November 15–27. Particulars may be obtained of the Mayor. A further notice will be issued when copies of the specifications reach the Foreign Office, London.

THE Belgian Government will receive, up to March 28, 1892, tenders for the construction and maintenance of a new sea-port at Bruges, and for a line of steamers under the Belgian flag to run to the new port. The conditions may be seen at the Commercial Department of the Foreign Office between the hours of 11 and 5.

NOTES FROM CHICAGO.

THE report of Chairman Jeffery, of the Grounds and Buildings Committee to the Exhibition Directory, which was submitted to the National Commission for information at its September meeting, contained among other matter the following :—

Contracts have been let for the buildings as follows :—Administration, 450,000 dols. ; manufactures, 1,000,000 dols. ; agriculture, 540,000 dols. ; machinery hall, 1,200,000 dols. ; electricity, 375,000 dols. ; mines and mining, 260,000 dols. ; transportation, 260,000 dols. ; horticulture, 300,000 dols. ; fish and fisheries, 200,000 dols. ; woman's building, 120,000 dols.

There remains to be let for all of these buildings contracts for annexes and roofing, the grand entrances, interior finish and decorations, as well as lighting, plumbing, &c.

The casino and pier will cost 150,000 dols. The fine art palace will cost 500,000 dols., and contracts for these have not yet been let.

Your committee herewith estimates for the completion of the necessary buildings, machinery, decorations, administration and maintenance up to the date fixed for the opening of the exhibition as follows :—Buildings, 7,295,000 dols. ; grading and filling, 450,000 dols. ; landscape, 323,490 dols. ; viaducts and bridges, 125,000 dols. ; piers, 70,000 dols. ; waterway improvements, 225,000 dols. ; water supply and sewerage, 600,000 dols. ; railways, 500,000 dols. ; steam plant, 800,000 dols. ; electricity, 1,500,000 dols. ; statuary on buildings, 100,000 dols. ; vases, lamps and posts, 50,000 dols. ; fuel and light during construction, 20,000 dols. ; heating, 8,000 dols. ; making a total of 12,066,890 dols.

There has been appropriated for the purposes of the World's Congress Auxiliary, 200,000 dols. ; landscape gardening, viaducts, fountains, &c., on the lake-front, 200,000 dols. ; general expense of construction department, 500,000 dols. ; making a grand total of 12,966,890 dols.

THE Chicago Exhibition Directors have appropriated 50,000 dols. for the expense of reproducing at the exhibition the Convent of La Ribada, Palos, Spain, where Columbus lived while perfecting his plans for his voyage of discovery. The building will be used for housing an extensive collection of Columbus relics, and its ancient appearance, it is believed, will afford a pleasing contrast to that of the magnificent palaces by which it will be surrounded.

PLANS have been completed for the Live Stock Assembly Hall at the exhibition. This building will stand just south of the colonnade connecting agricultural and machinery buildings. It will in form resemble the letter T, one portion being 500 feet long and the other 200 feet. On the first floor will be office room for cattle and horse associations, dog and pet stock associations, and all remaining live-stock organisations. On the second floor will be an assembly hall 172 feet long and 74 feet wide. Here the farmers will be given a chance to hold their assemblies. Special rooms are provided for the Farmers' Alliance, the National Grange, and other similar associations. The entire structure has been so planned as to give the farmers and live-stock men generally all they could ask in the way of accommodation. Chief of Construction Burnham has been instructed by the Committee on Grounds and Buildings to perfect working drawings and ask for contracts.

MEXICO, Guatemala, Salvador, Nicaragua, Costa Rica, Colombia, Ecuador, Peru, Chili and Brazil, will erect special buildings. Mexico will produce at Jackson Park one of the ancient Aztec temples. Guatemala will erect at a cost of 22,000 dols. a building on the model of one of the palaces of the ruined city

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Antigua. The building of Colombia will be the capitol of that republic in miniature. Ecuador has already given orders for the removal to Chicago of the reproduction of the Incas's "Temple of the Sun" that ornamented the grounds of the Paris Exposition.

THE Board of Lady Managers have received 107 designs for an official seal for the Board, none of which were conspicuously devoid of talent, and some of which possessed distinguished merit. Seven designs were selected from the entire collection, and, in compliance with the published terms of the competition, these were forwarded to St. Gaudens, the celebrated artist, who is to make the final selection from the seven. The Board, having decided to have a badge also, a circular requesting competitive designs will shortly be issued. The most important art competition yet invited from women is for the statuary upon the exterior of the Woman's Building. Circulars stating details have already been sent out. There are to be eight figures above the roof-line, and a relief composition in the main pediments. The space to be filled by the latter is 42 feet long and 7 feet high, affording ample scope for a beautiful symbolic design. Miss Enid Yandall, of Louisville, Kentucky, is engaged in modelling the caryatides supporting the cornice of the roof-garden of the Woman's Building.

LADY ABERDEEN is now in America, and will visit Chicago during the autumn.

VARIETIES.

THE Gaiety Theatre, Camden Street, Liverpool, a building which has been used for variety entertainments, has been burnt down.

PLANS have been prepared for building a bridge at an estimated cost of 800*l.*, to replace the ford over the Black Lyne at Blackpoolgate, Bewcastle.

THE *Gloucester Chronicle* says in the grounds of Whiteshill Vicarage have been found fragments of Roman pottery, calcined bones, and large-headed nails, characteristic of the vicinity of a Roman villa. Like the Woodchester pavement, the first finds were but 2 feet below the surface, when a stratum of soft brick and cement, mixed with charcoal, was reached. The two former substances, laid to a regular thickness of about 6 inches, always constituted the *suspensuræ*, or floor above the hypocaust, in Roman villas. The coins which have been found are in excellent preservation. One of the Tribune era, which has the traditional wolf on the reverse, and which dates about 400 years B.C., was easily deciphered, and others were of Constantine and Severus.

THE general committee of the Hospital Saturday movement in Birmingham have sanctioned the purchase of a mansion at Tyn-y-coed, Llandudno, at a sum not exceeding 7,500*l.*, for the purposes of a convalescent home.

ONE of the ornamental lions at the entrance to the Bargate, Southampton, placed there one hundred and fifty years ago, has fallen from its pedestal. Fortunately it fell at a very early hour, before the traffic had commenced.

A BRIDGE has collapsed on the North British Railway, on the Waverley route, about two miles north of Galashiels. It is a single iron girder bridge, resting on an abutment at each side. The flood undermined the abutment on the south side, and half of the bridge fell in, leaving the down line rails suspended.

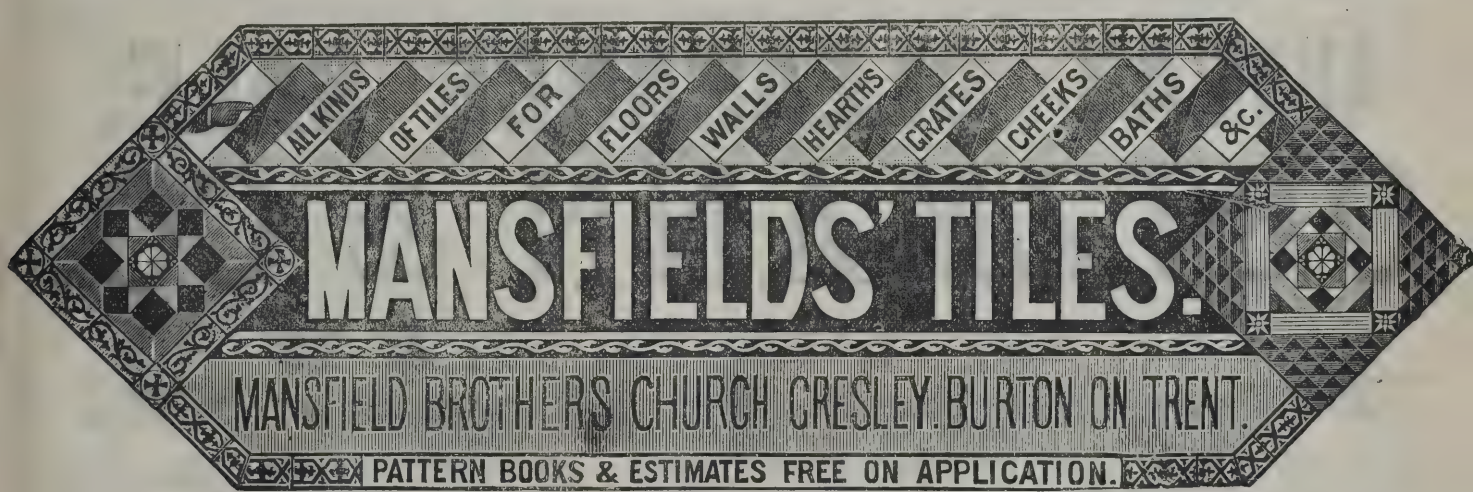
AN inquiry has been held at Southend respecting the application of the Southend Local Board to borrow 8,871*l.* 2*s.* 6*d.* for works of main drainage, for cliff improvements, and for the purchase of a pleasure ground. The main item of the loan is for the Eastern Valley main drainage. The sewerage scheme is divided into the outfall sewer, the main sewer and three branch sewers. The amount asked for is 7,240*l.*; 1,200*l.* was required for the Cliff improvements and 431*l.* 2*s.* 6*d.* for the purchase of Darlow's Green.

AT the meeting of the Canterbury Museum and School of Art Committee, the Mayor stated he had received a telegram from Dr. Beaney's executors, saying that the whole of the 10,000*l.* must be expended in the building and furnishing of a Beaney Hall, and none could go towards endowing it. He was of opinion that they could close the Museum Library, and make one big library; they could then endow it with about 300*l.* a year.

THE plans and specifications of a water scheme for Malvern have been prepared by Mr. Copland, C.E.

BY reason of increase of population and visitors at Clacton-on-Sea, the accommodation in St. Paul's Church has become insufficient, and more accommodation will have to be provided.

ON the invitation of Mr. Ben Sykes (of the firm of Messrs. Garlick & Sykes, architects, Blackpool and Preston), the directors of the Winter Gardens Company, some members of the Corporation and the town clerk (Mr. T. Loftos) have made a trip up the Ribble for the purpose of viewing the great navigation scheme and the docks which are now in course of construction at Preston under the direction of Messrs. Garlick &



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Sykes. The visitors were surprised to find the undertaking of such a gigantic nature, and to hear that it would be ready for opening early next year.

APPLICATIONS have been made in the Carlisle Consistory Court for removing old glass and substituting stained-glass windows in Rydal Church and Aspatria Church. The Chancellor, in granting both applications, said he would like to inform the diocese generally that one of the first questions he was asked when he was appointed Chancellor was whether it was necessary to take out a faculty for putting in stained-glass windows, and he was obliged to answer that it was the law that it should be done. In one church not long ago a large stained window was put in without any faculty having been obtained. Any one putting in a stained-glass window was liable to be cited before the Court at the instance of a parishioner, and made to pay for a faculty or take out the window; and it was an infraction of the rights of the parishioners to put in a window without giving them an opportunity of coming to the Court to say whether they objected or not.

NEW special seats have been placed in the Birmingham Town Hall for the coming Festival. They have been provided by Mr. A. R. Dean, for a committee of friends of the Festival, and have been made to take to pieces for easy storage. The number of chairs is 1,468, and the estimated cost of the process of reseating is 1,300*l.*

BUILDING AND BUILDERS.

A SITE has been purchased at Castleton for the erection of Wesleyan Methodist schools. It is proposed also to build a chapel later on.

IT is proposed to build a new college at Blairs at a cost of 25,000*l.* A site has been selected, but no plans have as yet been prepared.

A PUBLIC company has been registered in Edinburgh under the title of the Albert Hall Company, Limited, "to acquire, erect, or maintain buildings in Aberdeen to be used for the holding of public or other meetings, concerts, lectures, and letting for various purposes."

THE Bridgnorth Board of Guardians have decided to submit to the Local Government Board sketch plans of alterations to their infirmary, which include the building of two new wings in the place of building a new hospital on modern principles, as suggested by the architect to the Local Government Board.

IT is stated that a Masonic Temple is to be erected in Glasgow, the cost of the scheme being estimated at 20,000*l.* It has been decided that at least two-thirds of the money must be subscribed before any building operations are undertaken.

AT the meeting of the Stone Local Board plans of the proposed Station Hotel were passed, subject to proper tracings being deposited and to the building being constructed in accordance with the by-laws, and drainage constructed to the satisfaction of the Board.

CONTRACTS have, the *Scotsman* says, just been concluded for the erection of a new station at Bathgate Lower Station. The new station will be a handsome building, and the platform will extend to about 120 yards.

THE *Birmingham Post* says:—We understand that the promoters of the pig market, proposed in opposition to that to be erected by the Markets and Fairs Committee of the Birmingham Corporation, have concluded negotiations for the purchase of land, in the neighbourhood of Meriden Street and Bordesley Street, from Sir Alfred Gooch, Bart., and will shortly commence to demolish the property existing on the land prior to beginning the new structure.

A DINNER has been given by Mr. J. F. Lescher, of Brentwood, to the men employed by Mr. John Cross, builder, Mr. G. Yull, plumber, and Messrs. Faulkner & Sons, who have been engaged upon extensive alterations at Boyles Court, the seat of Mr. Lescher. The work is now practically completed.

CONTRACTS have been entered into for banking premises in North Parade and Manor Row, Bradford, for the Yorkshire Penny Bank. Mr. Jas. Ledingham, of Bradford, is the architect.

THE committee of the Aston Technical School have decided to buy a site and erect on it a technical school. A sub-committee has been appointed to arrange for plans and other details. The cost for site and building is estimated at about 6,000*l.*

THE Plans Committee of the Aberdeen Town Council have passed the plans for Mann's Hotel, in Union Terrace, the architects being Messrs. Matthews & Mackenzie. The estimated cost is 10,000*l.* Plans were also sanctioned for a chapel for the sisters of St. Margaret's of Scotland, to be erected on the west side of Spittal. Messrs. Bricknell & Cowper, London, are the architects, and the estimated cost is 2,000*l.*

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Over 1,000*l.* has been subscribed towards the 2,000*l.* required for the building fund for the enlargement of the accommodation for nurses at the Cumberland Infirmary, Carlisle.

Among the warrants granted by the Edinburgh Dean of Guild Court was one to Messrs. M'Vitie & Price for additions to their biscuit works at Gorgie Road.

The George Inn, West Street, Brighton, is to be rebuilt as a hotel at a cost, including adjoining property, of 21,000*l.* The architects are Messrs. Treacher & Fisher, of Coleman Street, E.C.

In the Wakefield county court, before Judge Greenhow, Henry Dickinson, a bricklayer, sued Mr. John Bagnall, builder and contractor, Eastmoor, for 70*l.* damages. On June 8 the plaintiff was working in defendant's employment repairing a maltkiln in Thornes Lane, belonging to or worked by Messrs. Sanderson & Sons. Plaintiff fell from a scaffold, in consequence, as alleged, of a scaffold-pole being defective, and defective to the knowledge of the defendant and his son William, a foreman of the defendant's. In defence, it was said that the plaintiff selected the scaffolding-poles, and that William Bagnall was only the timekeeper. The judge gave the plaintiff a verdict for 80*l.* and costs—40*l.* for wages and 40*l.* for pain and injury, he having fallen from the scaffold, which gave way, and sustained serious injury.

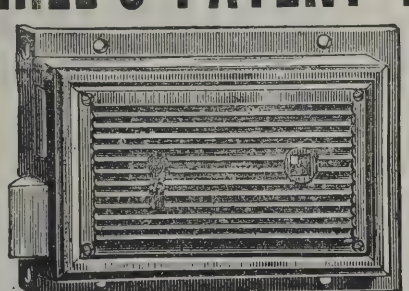
ENGLISH *v.* METRIC MEASUREMENTS.

Recent consular reports from Italy and Japan have referred to the loss of trade owing to firms in England sending to those countries circulars and price-lists based on the English weights and measures. The metric system is used in those countries, and our French, German and other competitors use it in their quotations, but the English firms in question are content to puzzle buyers with weights and measures which are very troublesome and not understood. A similar complaint now reaches us from Egypt in a consular report just issued, which points out that our weights and measures are "utterly unintelligible" to a large proportion of the persons to whom export houses in this country forward their circulars and price-lists in Alexandria and Cairo. The metric system of weights and measures is in force in Egypt, and exporters of English goods to that country should adopt it in their quotations and transactions.

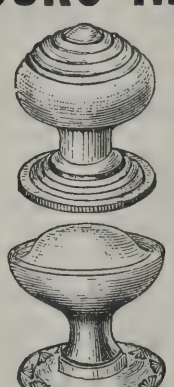
EIFFEL TOWER, BLACKPOOL.

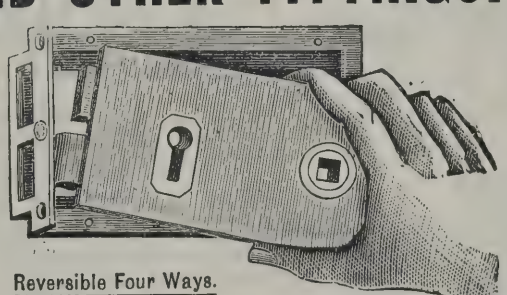
The foundation-stone of the Eiffel Tower for Blackpool has been laid. The syndicate formed to carry out the project entrusted the work to Messrs. Maxwell & Tuke, architects, Manchester. The buildings, the *Leeds Mercury* says, will occupy a site containing about 6,000 square yards in the centre of the town, lying midway between the two piers, and bounded on three sides by the Central Beach, Bank Hey Street and Victoria Street, and on the fourth side by a narrow street called Heywood Street, connecting the Central Beach with Bank Hey Street. Although the tower will occupy the central portion of the site, it will in reality absorb but a small proportion of the whole area. The space it actually covers is only one-fifth of the site, and even this portion is utilised on the ground floor as a circus. The design shows the tower surrounded on the ground and two upper floors by an enclosure of brickwork, 110 feet square and 73 feet high, and the whole of the space on the first and second floors is given to the circus, accommodating about 2,000 persons, with four entrances from the Central Beach and four in Bank Hey Street. On each side of the circus will be a large market or toy arcade, extending from Bank Hey Street to the Central Beach. These will be 61 feet wide, and will average 165 feet in length. They will be thoroughly well lighted from the two ends, and from four large areas which will distribute lights from the top. The present Aquarium and its complement of animals and fish will be reinstated at the south side of the circus, in a room 61 feet by 175 feet, extending from Bank Hey Street to the Beach, with windows on three sides, and with two areas for light, each 30 feet by 24 feet, in the centre. In addition to this room the Aquarium will occupy a space on the east side of the circus, 115 feet by 19 feet. The space over the northern arcade will be devoted to exhibitive and recreative purposes, amongst which it is intended to instal a rifle shooting gallery, with scenery accessories, similar to that which has proved so attractive in the Naval Exhibition. The north end of the first floor, 144 feet by 24 feet, over the shops facing Victoria Street, will be equipped as a first-class restaurant. The second floor of the building will be almost wholly occupied as a promenade concert-room, 223 feet long and 110 feet wide, and by large open balconies facing the sea, and in Bank Hey Street by a billiard-room at the north end to accommodate nine tables. The numerous open balconies, containing on the whole 17,000 square feet, will be a great feature in the design, and it is expected that refreshments will be served

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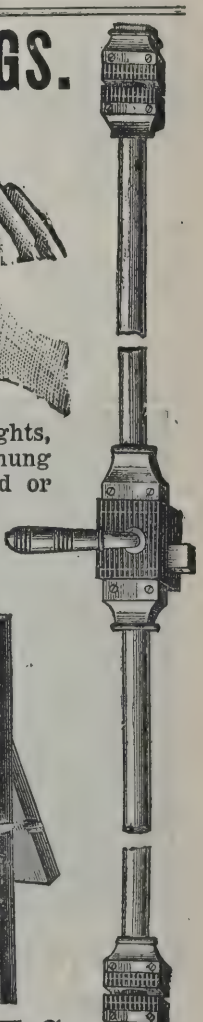




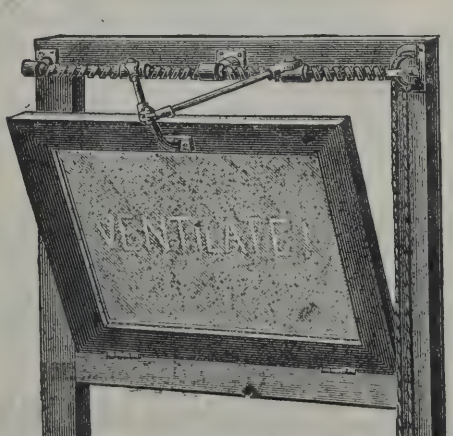
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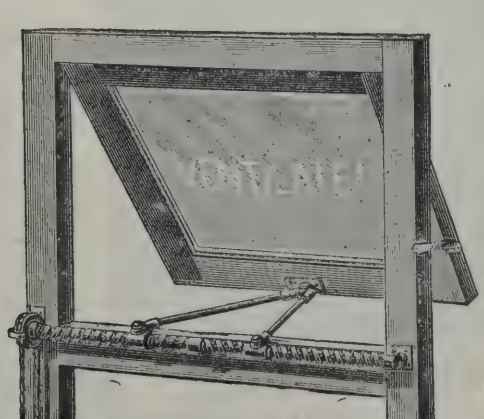
(Triple-Action Bolt.)



(Patent Bolt for Narrow Stiles.)







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here, and that during the season they will be beautifully decorated with evergreens and flowering shrubs. The third floor of the building will occupy only the space over the circus exclusive, which is 110 feet square. It will consist of open balconies, 18 feet wide, on four sides, and of an enclosed hall, 70 feet by 44 feet, where the elevators from the ground-floor terminate, and where those going to the top of the tower commence. The two sides of this hall will be enclosed by cafés and by shops for the sale of souvenirs and other trifles. The principal entrance to the tower and to the various rooms already described will be on the central beach, and will consist of a hall 48 feet by 34 feet, from which lead two 9 feet staircases to the first and second floors, and two subsidiary staircases 5 feet wide to the first, second and third floors, and two elevators, each with a cabin 12 feet by 6 feet, which will convey visitors to the first, second and third floors and to the tower. In addition to this there will be two entrances in Bank Hey Street, each with a 5-feet staircase leading to the first, second and third floors. The means of exit have naturally received careful consideration, and they are ample enough to allow of the entire clearance of the building in a very few minutes.

EDINBURGH CITY CONTRACTS.

LAST week a report appeared of the discussion in the Edinburgh Council Chamber. Messrs. William Gray & Son, who are most aggrieved, offer the following remarks on what was said:—Because Bailie Russell can find no satisfactory answer to the complaint which we have made regarding our contract with the town, he demeans himself by abusing us and our workmanship in an underhand manner. In his speech to the Town Council on Tuesday he stated as his main reason for not fulfilling that contract that "the committee had to go to people who they were sure would act promptly and successfully," and he also hinted that our workmanship was bad; but we would ask Bailie Russell, instead of making general charges against us, to point his finger to one instance where we did not act "promptly and successfully," or where our work was not first-class. This would be more manly on Bailie Russell's part, but as it is impossible for him to do so he contents himself with attempting to blind the public by making a sweeping charge. Does Bailie Russell not see, when he makes such a charge against us, that it is convicting his own Council of muddle-headedness; for why would the Town Council ever think of entering into a contract with a firm who they were not sure would act "promptly and successfully?" We would assure Bailie Russell, however, that we have executed many important contracts—much more important than the one in question—and it is quite a novelty to us to hear that the quality of our workmanship is challenged. We do not wish to say more on this subject, as we are satisfied that it was necessary for Bailie Russell to say something in his defence, and as he had nothing better to say, he fell into abuse.

In Mr. Morham's report, read by Bailie Russell, he attempts to make out that our contract was for locks and hinges only, but permit us to say that our contract, which is now before us, is for "smith and ironmongery work," and it seems proper that all work under these denominations should have been executed by us at schedule rates. We had also a contract with the town for locks and hinges, as stated in the report, but this is a separate contract altogether. But Mr. Morham's report also defends the position of the Town Council on the ground that there is a clause in the contract reserving to the magistrates and Council power to enter into any separate contract they may consider desirable, and this may be a very wise provision if properly applied. But it surely cannot apply to the present case, where we got work to do under our contract to the amount of 23*l.*, while ex-Bailie Walcot, during a shorter period, ran up an account against the town amounting to 41*l.* We asked in our former letter that Bailie Russell should state the rates which were paid to these outside tradesmen; but he apparently declines to do so, and the reason of his refusal is perfectly obvious. It is this:—That the committee paid very much higher rates to ex-Bailie Walcot than we had contracted to do the same work for. For instance, ex-Bailie Walcot charges 1*s.* per hour, on an average, for a workman, and the town only pays 7*d.* per hour, less discount, to the contractor. Is this throwing away the ratepayers' money, or is it not? There is a standing order in the Town Council to the effect that all work above 20*l.* in value is to be publicly estimated for. Will Bailie Russell produce the estimate given by ex-Bailie Walcot for the work executed by him? We are afraid he cannot, as none exists.

When we found a man being frequently employed at the City Hospital and elsewhere executing the work which should have been performed by us, we went to Mr. Morham, the superintendent of works, to inquire the reason of the work being given to another tradesman, and he informed us that he was not aware that any work was being done in the hospital beyond

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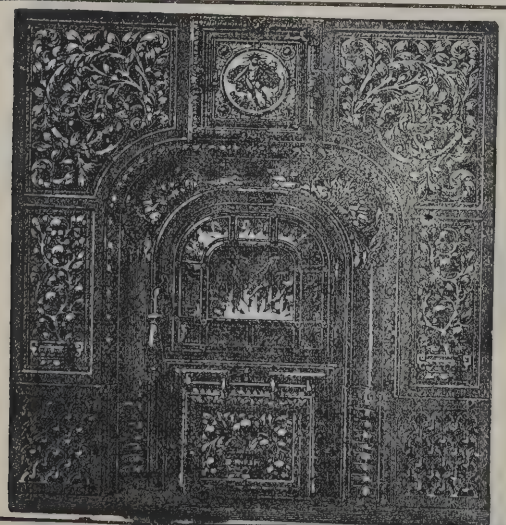
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our own, and said that the work must have been ordered on the instructions of some other person. He also said that the doctor—not the would-be Provost doctor, but the doctor of the hospital—had taken upon himself to order certain repairs to be executed at the hands of other tradesmen, and that the doctor certified the accounts himself. Mr. Morham further confessed that one of the Parks Committee had asked him to give the tree fences and the repairs on the fences, which fell under our contract, to another tradesman, but asked us to write him on the subject ourselves and he would submit it to the committee. We thought, however, that matters had come to such a crisis that it was time to go to headquarters, and we accordingly wrote the town clerk. Now it is well known that the ratepayers have to provide Mr. Morham with a salary of 700*l.* a year, and part of his duties is to give orders for the execution of necessary works on the instructions of the various committees. Bailie Russell, however, appears to think that Mr. Morham is already over-wrought, and relieves him of part of his duties by ordering the work direct himself. If this be not correct, we beg to ask Bailie Russell to state if the orders given to ex-Bailie Walcot for work executed by him run consecutively through the superintendent's books. The orders may have got to the books by this time, but they were not there at the time the work was ordered, as they ought to have been.

Ours is only one case which has been brought to light, but, unfortunately, the system of dealing which we have exposed is far too common among our municipal rulers, and the sooner this mode of doing business is put an end to the better for the ratepayers. The latter have it in their own hands in the month of November, and it will be very strange indeed if they do not take care that more worthy men are sent to represent them at the Council Board.

REGISTRATION OF PLUMBERS.

At the 17th Annual Congress of the Sanitary Association of Scotland, held in the Council Chamber, Edinburgh, under the presidency of Dr. Robert Farquharson, M.P., Mr. Alexander M. Scott, writer, Glasgow, read a paper on the national registration of plumbers in its relation to the public health. He recalled the circumstances attending the inauguration of the movement for the national registration of plumbers, and explained that the district councils of the body had nothing whatever to do with any trade organisation, but existed solely for the benefit of the public. Since the movement had been set on foot a considerable number of technical classes in plumbers' work had been established over the country, and the attendance at these had been large. While such good was being derived from the registration movement, it was, of course, in the future that its full benefit from the point of view of public health would be felt, when the rising generation of plumbers all over the country should have a technical as well as a practical training. Hitherto no Parliamentary powers had been asked in connection with the movement, but now that registration was general, the time was ripe for introducing a Bill into Parliament in order to obtain the necessary disciplinary powers for the satisfactory carrying out of the system. It was desired by the trade that a Parliamentary measure such as this should be passed. The proposed Bill was drafted, and had the approval of the recent Congress of Scottish district councils in connection with the registration movement. It was not intended that the Bill should act compulsorily on the trade; the object was to obtain powers for the formation of a Council of competent jurisdiction and authority to take measures for systematically promoting technical education among all plumbers in the United Kingdom, and for regulating the classes of those plumbers who were enrolled as registered plumbers. The registration movement and the proposed Bill were in the interests of public health of the community.

The President said that legislation in the direction referred to by Mr. Scott was sometimes rather difficult, but from his experience of the House of Commons, he thought that the Bill which had received the preliminary sanction and support of the authorities would go through the House without any difficulty whatever. It was proper, also, that penal powers should be conferred upon the company to enable prosecutions to be instituted against all persons who, without registration, took a title which would induce the public to think that they were registered.

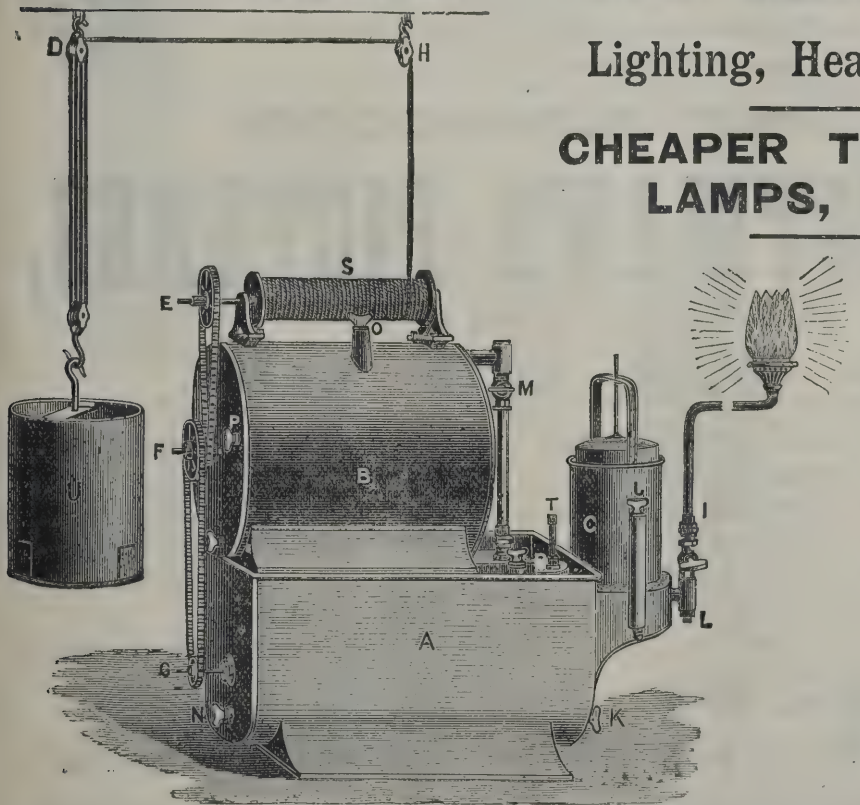
Dr. Caldwell Smith, Motherwell, moved:—"That the Congress, in the interest of public health, approves of the national registration of plumbers, and remits to the Parliamentary Bills Committee of the Association to consider and, if thought desirable, to petition in favour of any Bill that may be submitted to Parliament for furthering the objects of the movement."

The resolution was supported by Dr. E. Duncan of Glasgow, Mr. Kenneth Cameron, of Aberdeen, and others, and, after a lengthened discussion, carried unanimously.

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HORNE, W., 10 Wales Street, Aberdeen, N.B.
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STEAD, R., Thorner, Leeds.
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CARTER, H., 3 Brooklet Cottages, Underwood, Plympton.
CHAMBERS, J., 27 Ladyman Street, Preston.
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DOWN, W. J., Vine Cottages, Underwood, Plympton.
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MOORE, S. A., Funtley, near Fareham, Hants.
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METROPOLITAN WORKS.

ON the recommendation of the Finance Committee of the London County Council, it has been agreed to lend the Vestry of Lambeth 20,000*l.* for Jarrah wood paving works in the Kennington Park Road and Brixton Road, repayable as to 6,000*l.* in ten years, and 14,000*l.* in seven years; the St. Saviour's District Board 1,600*l.*, for wood-paving in Borough High Street, repayable in three years; the Vestry of St. Margaret and St. John, Westminster, 10,300*l.*, for asphalte and new wood-paving works, repayable at periods varying from five to ten years; the Guardians of Fulham 26,000*l.*, to defray the cost of the enlargement of their workhouse, repayable as to 21,000*l.* in thirty years and 5,000*l.* in fifteen years; the Guardians of St. George's-in-the-East 6,200*l.*, to purchase a freehold site and erect a laundry, 5,000*l.* being repaid in thirty years and 1,200*l.* in fifteen years; and the Commissioners of Baths for St. Margaret and St. John, Westminster, 7,000*l.* to purchase a freehold site and erect a library, repayable in thirty years.

RICHMOND MAIN DRAINAGE WORKS.

ON Monday the new works constructed at Mortlake by the Richmond Main Sewerage Board for the collection and disposal of the sewage of the parishes of Richmond, Barnes, Mortlake, Kew and Petersham were opened by Mr. Ritchie, M.P. The sewage of the above parishes has hitherto been partly discharged in its crude state direct into the river Thames, and partly retained in cesspools. Both of these evils will be remedied by the present works, which have been constructed in accordance with the plans and under the direction of Mr. J. C. Melliss, C.E. The works were begun in August 1888, and, many unforeseen difficulties and delays occurring, three years have been occupied in their construction. They provide each of the parishes of Barnes, Kew and Petersham with an outlet into which it can discharge its sewage matter, the outlets being placed at a sufficiently low level to drain the whole district. In like manner Richmond and Mortlake have been provided with several such outlets for the reception of their sewage, and for diverting its flow from the Thames. These outlets for the five parishes are connected together by main intercepting sewers, which have been constructed by the Main Sewerage Board. The sewage arrives at the works in a fresh state before any decomposition has had time to take place. It is strained through an iron bar strainer before entering the pump chamber, cabbage stalks, rags and similar articles being thus removed and daily disposed of by being dug into the gardens. In quantity this will be about 1 cwt. per day. The strained sewage then flows continuously into the pump chamber, where it receives a small dose of milk of lime from the vats in one of the chemical mixing-rooms. It is then pumped to the



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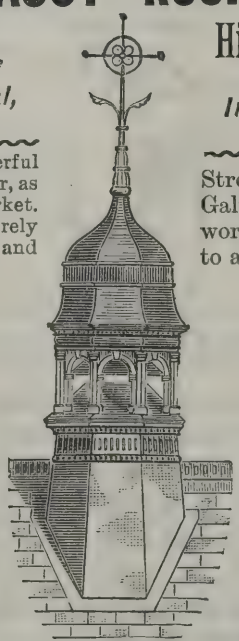
surface, the operation of pumping also serving to thoroughly mix the sewage and the milk of lime together. The partially-treated sewage then flows from the delivery pipes of the pumps by a covered channel along the side of the pump-house. It then flows continuously to the inlet channel for treated sewage, passing in its course through a close iron bar strainer which removes any large matter that may have passed the first strainer; also through the second chemical mixing-room, where it receives a dose of a solution of sulphate of alumina, carbon and iron, and is thoroughly mixed therewith by an agitator placed in one corner of the chemical-room. The treated sewage is admitted continuously into one or more of the precipitation tanks, as required, by the opening of valves, and flows continuously over weirs extending the entire width of the tanks. As the tanks fill, precipitation takes place, the precipitate rapidly falling to the bottom of the tanks, while the effluent water, now deprived of the whole of its polluting matter in suspension and nearly all of that in solution, flows continuously over weirs at the other end of the tanks. This effluent water is sufficiently pure to be discharged direct into the river, and is passed thereto, by the outlet provided, at the north-east corner of the works. The effluent water can be raised to a higher degree of purity, whenever required, by filtration through filter-beds constructed of layers of various-sized gravel, sand and carbon; the surfaces being covered with a thin layer of agricultural earth sown with grass. The precipitation tanks are emptied of their entire contents once a day, and when a tank has to be emptied it is shut off from the inlet-treated sewage channel by valves, and allowed a short time for repose; the water is then drawn off from the tank by a floating valve, the upper portion of the water, owing to the levels, being discharged on to the high-level filter-beds, and the lower portion on to the low-level filter-beds. The precipitate (commonly termed "sludge") at the bottom of each tank averages from 2 to 3 inches deep, being about 90 per cent. water. The water drawn off from the tanks and passed away to the filters or the river direct, is not, however, lowered quite down to the precipitate, the water immediately overlying the sludge for a depth of 6 or 7 inches being retained with the sludge. The bottoms of the tanks slope so as to form a channel, and the sludge and water last mentioned together gravitate, with the aid of sweeping, from the tanks into a covered sludge passage passing along their upper ends, and thence into the sludge-chamber beneath the presshouse. In this sludge-chamber precipitation still rapidly takes place, and the water which rises to the top of the sludge is drawn off, but not allowed to pass to the filter-beds or the river, but flows back again into the pump-chamber, mixes with the sewage, and is therewith treated over again. The quantity of water thus dealt with is comparatively very small. The sludge, having thus been deprived of some of its water in the sludge-chamber, and brought into a favourable condition for pressing, is lifted by pumps into iron receivers placed in the presshouse. These receivers each contain a charge for one press. In these it is limed—that is, a small quantity of lime is added to it so as to facilitate the operation of pressing—and it is forced by rams into the presses. The water pressed out of it (again a comparatively small quantity) passes to the pump-chamber and mixes with the sewage to be treated over again, and the solid "sludge-cakes," measuring 3 feet square by 1½ inches in thickness, are removed from the presses. Sludge in this pressed condition occasions no nuisance whatever, and may be stacked and stored without creating even an annoyance. For agricultural purposes it is stated to have a manurial value rather higher than that of the best farmyard manure. The quantity that will be produced from the present population will be about 10 tons daily, and, considering the great demand for manure of all kinds by the market gardens surrounding the locality, it is believed that there will be no difficulty in disposing of it. Pressed sewage "sludge-cake," which contains about 50 per cent. of water and readily parts with such water, is very suitable for making up and raising low-lying land, and the Board will be able to utilise much of it for this purpose of raising to a higher level, and thus materially improving, their own land. The entire cost of the works, including the sewers, will amount to between 115,000*l.* and 120,000*l.* The exact outlay has not yet been, and cannot at present be ascertained. The annual expense of carrying on the works, including pumping the sewage, is estimated at 3,500*l.*, and this, together with the repayment of capital and interest, will not, it is expected, exceed a rate of 7½*d.* in the pound for the entire cost. The charge is borne in due proportions by the urban and rural parishes, according to their respective rateable values from year to year. Both the Richmond urban and rural sanitary authorities have expended, and are still expending, large amounts (independently of the Main Sewerage Board) in extending and improving their local drainage, and adapting it to, and connecting it with, the main sewers of the Board. When these works are completed, as they shortly will be, the entire districts of the two authorities will be supplied with a complete and effective system of drainage, purification works and outfall.

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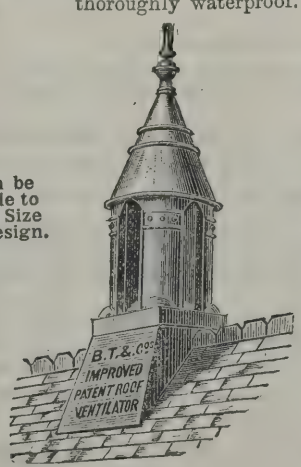
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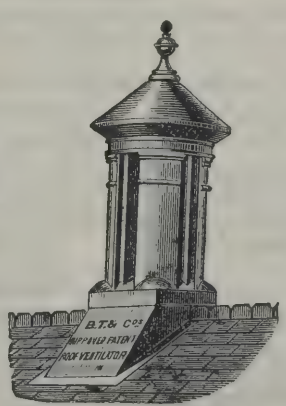
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SHORTLANDS AND NUNHEAD RAILWAY.

This line, now in course of construction, commences by a junction with the London, Chatham and Dover Railway Company's main line at Shortlands Station and terminates by a junction with their Greenwich branch at Nunhead Junction. The object of the line is to develop some of the estates through which it passes, and which will become valuable residential properties, the owners of these estates being among the chief promoters of the railway. It will also give the London, Chatham and Dover Railway Company, who are under an agreement to work the line, an alternative route for their main line traffic into the metropolis *viâ* Nunhead Junction and the South London line.

For a suburban railway the country passed through is very open, the only building property actually taken being at Catford, yet the number of bridges is considerable, averaging about five per mile. This is mainly due to the number of bridges erected for the accommodation of the landowners in laying out their estates. All the bridges will be of an ornamental character, and the slopes of the cuttings and embankments from Shortlands through Catford will be planted with shrubs and trees.

Amongst the works are included three bridges over existing railways, two short brick viaducts and a retaining-wall in Catford, besides other public road and accommodation bridges. The bridge over the South-Eastern Railway, near Catford, will consist of two N truss girders with a skew span of 113 feet each, with underhung cross girders and rail bearers. That over the London, Brighton and South Coast Railway at Brockley will consist of three girders 110 feet span each, of a type similar to those just mentioned, the centre one being between the two lines of rails. The floor in this case will consist, as the headway is limited, of troughs built up with angle-bars and plates.

In the case of bridges carrying roads over the railway, the superstructure consists of girders and jack arches, except in three cases where headway is limited and longitudinal-built trough flooring has been used, supported by a transverse girder on columns in the 6-foot way. In the case of road bridges under the railway trough flooring will also be extensively used on account of the limited headway in most cases. This construction also enables the floor to be made perfectly watertight, and the transverse sleepers lying in the troughs being surrounded with ballast, the sound of passing trains will be deadened as much as possible. These bridges have all a clear span of 40 feet at least, and in some instances where the span is greater columns standing on the curbs of the footways are being introduced to lessen the weight of the girders and to improve the appearance of the structures. Steel is being used for the bridgework throughout, the columns in the roadways and ornamental work being of cast-iron.

There are to be five stations on the length, not including those already existing at Shortlands and Nunhead. It is expected that the line, which was commenced in July 1890, will be ready early in the ensuing year.

The work is being carried out under the superintendence of Mr. John Wolfe Barry, the company's engineer, and Messrs. Lucas & Aird are the contractors.

THE IRON AND STEEL INSTITUTE.

The autumn meeting of the Iron and Steel Institute will be held in London on October 6 and 7, this being the third time that London has been selected for the place of this meeting. The programme, which has just been issued to the members of the Institute, intimates that the first day's meeting will take place at the Royal Arsenal, Woolwich, when two papers will be submitted, the first by the Director-General of Ordnance Factories, Dr. W. Anderson, F.R.S., "On the Constitution of the Royal Ordnance Factories"; and the second by Captain Holden, R.A., proof officer, Woolwich, "On the Measuring Instruments used in the Proof of Guns and Ammunition at the Royal Arsenal." After the morning meeting, the members will be conducted over the manufacturing departments of the Arsenal, and will be entertained at luncheon by the president of the Institute, Sir Frederick Abel, K.C.B. After lunch, other departments of the Arsenal will be visited, and the members will then assemble at the Proof Butts to witness the firing of quick-firing and machine guns, experiments with smokeless powder, &c. On the following day the Institute will resume its sittings at the Institution of Civil Engineers in Westminster, when a number of papers will be read, including one by Sir Henry Bessemer, F.R.S., "On the Manufacture of Continuous Sheets of Malleable Iron and Steel, direct from Fluid Metal," and another by the Director of Naval Construction, Mr. W. H. White, C.B., "On Illustrations of Progress in Material for Shipbuilding and Engineering in the Royal Naval Exhibition." Several places of interest will be open for the inspection of

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TESTIMONIALS.

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75 Newman Street, Oxford Street, W.: Feb. 15, 1887.
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CONFLAGRATIONS IN CITIES.*

CITIES have always been an expression of civilisation, measured by the skill and enterprise of their builders. Every human resource, stimulated by sentiment for home, avarice for possessions, and desire to be equal to posterity, has contributed means for fashioning them with a view to the utmost permanence; yet their history has been a continuous record of conflagrations whose devastating lines form historical divisions, separating the old from the new, and making swaths which have often proved to be paths for new improvements, but achieved at oppressive costs which would never have been entered upon voluntarily by the owners of the property destroyed. Most of these fires have resulted in forcing reforms in regard to streets, buildings, laws and health. Blessings they may have been, but to those directly interested at the time, most completely disguised.

The accounts of early fires ascribe them to the visitation of an angry Jehovah or Jupiter, by the exercise of a supernatural power, and it is indeed without question that many of these instances of destruction were the result of natural causes, as earthquakes, volcanic eruptions and lightning. However, little is to be feared from the latter form of visitation by any possibly reprobate city of to-day, thanks to the inductive effect, as well as the direct diffusion of the lightning by the much-abused overhead wires, which serve as a guardian between the earth and the sky, robbing the thunderbolt of most of its former dangers. The Christian era is only midway back to the earliest account of the burning of a city contained in the Holy Writ (Gen. xix.), describing the rain of fire and brimstone on Sodom and Gomorrah. So terrible was this devastation that the once fertile sites of these cities are to this day a sterile waste.

It is evident from the record of laws fixing penalties for such crimes that human agency was well recognised as a criminal cause of fires among the ancients. Among the Egyptians arson was punishable with death, and the Mosaic law, enacting a similar penalty, was probably a repetition of the same. In China it is forty blows for an accidental fire, and one hundred blows for a malicious fire in one's own house, and for causing a fire in any other house, death. Notwithstanding these severe penalties and the absence of insurance policies, the cities of the Orient, largely built of bamboo covered with thatch, and having narrow lanes, though well fitted to withstand earthquakes, are continually subject to conflagrations. One who was a resident in China for many years has stated, as a matter of opinion, that he considered the average existence of dwellings in cities to be about five years. In Japan so-called fire-engines, consisting of square wooden pumps attached to tubs, are hung from verandah roofs. These devices are of insufficient capacity and generally out of repair, like much of the independent fire apparatus among Occidental nations, and the main reliance is upon mud or stone buildings in the yard at the rear of the houses. These serve as safes in which the household goods can be stored in face of threatened conflagration. Such buildings are called by the Japanese "kura," and by foreigners "go-downs," although the latter term is also applied to storehouses owned by Europeans. Oriental cities have been devastated by fire again and again. The courses of such conflagrations have been plotted on maps of Japanese cities by Dr. T. C. Mendenhall, superintendent of the United States Coast Survey, formerly of the University of Tokio, and later of the United States Weather Bureau, and it has been found that the general trend of these fires is coincident with the direction of the prevalent winds.

Historical Fires.—Among the great fires of history undoubtedly the burning of the Serapæum Library, at Alexandria, in the year 640, by the Caliph Omar I., is most widely mourned, as the destruction of 500,000 volumes cut off much of the record of human knowledge at that time. The general impression of the importance and significance of this fire is, no doubt, augmented in great measure by the barbaric answer of this Saracen conqueror, who replied to the protest against the burning with, "If the books are against the Koran, they are pernicious and must be destroyed. If they agree with the Koran, they are redundant and need not be preserved;" and it is not generally remembered that Julius Cæsar burned a large library of 700,000 volumes at Alexandria, known as the Brucian Library, B.C. 48, nearly 700 years before the burning of the Serapæum Library by Omar I.

At times of sack and pillage, Jerusalem has been burned

* A lecture delivered before the Franklin Institute, Philadelphia, by Mr. C. J. H. Woodbury, vice-president Boston Manufacturers' Mutual Fire Insurance Company.

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time and again, the most noted instance being at the siege by the Romans under Titus, during the year 70, when a faction called the Sicarii set the city on fire in many places, and eventually 1,100,000 of the inhabitants perished by fire and the sword.

Constantinople has, like all Oriental cities, suffered severely from fires, a large part of such losses being undoubtedly due to the fatalism of the Mahomedans, who bow to their kismet. Said a Sultan, "If it be the will of Allah that my favourite city burn, it is the will of Allah." In Dillaway's quaint account of travels in the Levant in 1797, it is stated that the Sultan is summoned three times to a fire in Constantinople, and if the fire lasts an hour he is obliged to attend in person, and bring mules laden with piastres for the firemen. The proverbial liberty during fires exists on these occasions, for custom gives to the women the privilege of execrating the Sultan with impunity whenever he appears at a fire. But it is evident that this custom of receiving piastres and bestowing virulence has in nowise tended to diminish the fires any more than the system of giving a reward to the company first at a fire under the volunteer departments of the last generation effected such results.

Rome continues to be the eternal city in spite of numerous fires, whose reported number may be greater than that of any other historical city, merely because the records are more perfect. Many of these fires are of great interest at the present day, because the lessons which they taught were well learned, and gave rise to new and original methods in preventing the repetition of the same incidents. A great fire at Rome, 12 B.C., caused the Emperor Augustus to take measures for increasing the defence against fire, which had been hitherto in the hands of bodies of police, numbering twenty or thirty, stationed in various portions of the city, and reinforced at times of fire by companies of volunteers. He appointed new officers with the rank of magistrates, who were entitled to wear magisterial robes. Each was attended by two lictors, and provided with a fire organisation of six hundred slaves. It is probable that this was not entirely satisfactory in its operation, because six years later another fire caused him to undertake further reforms on a scale fully characteristic of him who "found the city built of brick, and left it with palaces of marble." He increased the fire department to a scale commensurate with the needs of the city. Seven thousand freemen were organised into seven battalions, and one battalion was quartered in every alternate ward of the city. These men made careful inspections of the kitchens, of the heating apparatus and of the water supply in the houses, and every fire was the subject of judicial examination. The cost of the organisation was maintained by a tax of 25 per cent. on the sale of slaves. It is undoubtedly true that this organisation, to which only a brief reference has been given, was of the greatest efficiency, for I can find no reference to any great fire in the city for seventy years, when it was set on fire by the Emperor Nero in the year 64. The account of this fire, given by Lanciani, as the result of the latest investigations, is so different from the generally accepted tale of the city being set on fire by the malice of Nero, "who played the fiddle while Rome burned," that the recent version may be of interest. Nero desired to make many changes in the streets of Rome by increasing their width and making many of them more direct, and also to introduce many improvements by reconstructing public buildings. His efforts in this direction were met by an opposition from property-owners, and were also embarrassed by the fact that the city abounded in temples, altars and shrines which were inviolate. The Emperor directed two architects, Severus and Celer, to prepare plans for a rearrangement of the streets in certain parts of the city, making them as near to straight lines and right angles as the hilly configuration would render feasible. Numerous public squares were laid out, and a system of sewers planned. Regulations for buildings were prepared, in which it was provided that the height of houses should not exceed double the width of the street, that each house should be completely cut off from the adjoining buildings, that each house should have a portico in front, and that wood ceilings should be excluded from the first storeys of buildings. Tents and booths were secretly prepared, and vessels were sent to various Mediterranean ports after grain with orders to rendezvous at the delta of the Tiber on a certain date. In accordance with this plan the city was fired in numerous places, and of the fourteen wards three were entirely destroyed and seven burned in great part. The crowds driven out of their homes found the booths in the outskirts of the city ready for them. The grain-laden vessels appeared in time, and the town-people were fed and housed during the rebuilding; the whole plan having been carried into effect without exposure, famine or loss of life, although the population numbered at the time 2,000,000. Improved hygienic conditions have been the usual result of conflagrations, because in the natural course of events those engaged in rebuilding have availed themselves of opportunities

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to introduce improvements, and often the causes leading to certain local epidemics have been destroyed; but it is without parallel that a city should be burned from hygienic motives.

Two notable examples of contagions stopped by conflagrations are the burning of Moscow by the besieging Tartars in July 1570, when the plague was stopped; and secondly, the fire in London, September 2, 1666, which also stopped the plague, and it has been unknown there since. This London fire is properly called the Great Fire of modern history, because the reforms which were started in consequence of it are living issues in the municipal affairs of to-day. The fire was caused by an overheated baker's oven; and in the course of four days it swept over 463 acres, burning 13,200 houses, 89 churches and St. Paul's Cathedral, causing a damage estimated to be 10,716,000*l.*, say 53,500,000 dols. The number of contemporaneous books upon the subject of this fire is between 200 and 300, but the greater part of them, judging from the list of their titles, contains but little information. The wonderful diaries of Samuel Pepys and Sir John Evelyn contain about all that is known in regard to this fire. Pepys was a man of the world, among the official set as Secretary of the Admiralty, a keen observer, and perhaps a journalist born out of due time. Evelyn was one of the gentry, complacent, more than pious, and quite philosophical in the bent of his mind. The one was the most perfect foil for the other. Under the direction of Pepys the fire was stopped by blowing up buildings, which was, at the time, the only method of reducing a fire that had grown beyond the capacity of the small fire-engines. These were on large tubs, and threw a stream of water directly on to the fire, as hose was not invented until ten years later (1672) by Van der Heide.

Important results followed the action taken in consequence of the Great Fire. The building regulations enacted provided for the reconstruction of the city with wider streets and better water supply and sewers—thus fitting London for the position of great commercial supremacy which that city has since maintained. The principle of modern fire insurance was also put into practice shortly after the fire and as a consequence of it. At a far earlier date there had been a form of marine insurance, and also a method of mutually indemnifying against fire, water and robbers, by the guilds; but both of these were by a mutual compact, socialistic in its nature, and not comparable to underwriting in modern practice, with its general commercial applications.

All cities have gained much from the experience derived from conflagrations. The French building laws are said to have been improved in great measure from action taken as a result of a fire in Paris in 1716, although the "Code Napoleon" (1804) increased these rules and restrictions to an extent praiseworthy in its results.

The firing of cities has been used as a desperate means of defence, which injured friends and foes alike; one notable instance being the burning of Jerusalem by the Sicarii, to which reference has already been made. Another example of burning a city in self-defence is the burning of Moscow, September 1812. Napoleon, in his campaign against Russia, in revenge for his repulse as a suitor for the successor of the yet undivorced Josephine, entered Moscow, September 14, proposing to make winter quarters there. On that very day fires began to appear, and in less than a week the city was in ashes. The loss of life is said to have been 20,000 of the sick and wounded, with a direct loss to the French of 40,000. The invaders were thus driven back in that terrible retreat in the dead of winter.

The cities of America, on account of the larger amount of wood in their construction and the prevalence of irresponsible methods of building, have suffered severely from fires, and it is from these fires that conclusions are to be drawn for suggesting measures that will tend to diminish their recurrence. Some of the possible elements of hazard, like those due to electricity or to very high buildings, are too new for their exact weight to be formulated; and others, like the attempt of the Indians to burn New York in 1711, have ceased to exist, at least in the older portions of the country. But such hazards have always existed at the frontier in the westward growth of civilisation.

The first devastating fire in America was probably the one occurring at Boston, March 20, 1760, when 400 dwellings and stores were burned, causing a loss of 100,000*l.* Generous contributions were sent from other cities to the people of Boston; and in 1811, when a large portion of the city of Newburyport was burned, the citizens of Boston, with a liberality which they have never failed to tender to other cities that have suffered by fire, took the initiative in subscribing for the relief of the sufferers.

In the colony of Massachusetts Bay regulations in regard to construction of chimneys and thatched roofs were made as early as March 16, 1630, and various enactments were made at later dates. The ordinance at the town meeting at Boston, March 14, 1645, made provision that each householder should have ladders long enough to reach the ridge of his house, and

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a pole "about 12 feet long, with a good large swab at the end of it," and various graded penalties were provided for those not conforming to the law.

It is difficult to obtain a record of early American conflagrations outside of local histories. New Orleans was burned in 1777, and every city seems to have had more or less of similar calamities. Philadelphia has been remarkably free from conflagrations in comparison with other large cities. This may be in part ascribed to the early introduction of water, giving that city for several years an advantage in the way of an abundant supply of water. In a greater measure it is due to the abundance of land, making it feasible to avoid the density of buildings which is common to most cities; and in chief measure it is probably due to the prevalent and wise custom of people owning their homes, a fashion which in many other respects tends to prosperity and good order. Reference has been made to numerous fires on account of their relation to the growth of various methods of protection; but in Philadelphia it appears that the excellent record is due to the initiative measures, beginning with the Act of the Provincial Legislature in 1696, directing that every householder should keep at his dwelling a bucket ready for use and a swab, 12 or 14 feet long, under penalty of twelve shillings for neglect, and forbidding the burning out of foul chimneys, penalty forty shillings, and the smoking of tobacco on the streets day or night, the fine for the latter being tenpence.

New York was visited by a severe conflagration in the southern part of the city on December 16, 1835, which extended over an area of forty acres, destroying 674 houses and causing a loss which has been estimated as high as 30,000,000 dols., on which there was only 8,000,000 dols. insurance, an amount which ruined several insurance companies. It has been held by some that the destruction of property by great fires has rendered them the cause of financial depressions, and in this connection it has been stated that this New York fire was the cause of the panic of 1836.

Philadelphia does not appear to have been visited by a great fire until July 9, 1850, when a fire along the Delaware river front at Vine Street extended over eighteen acres, causing a loss of life estimated as high as thirty-three, in addition to 120 wounded and a pecuniary loss of 1,500,000 dols. The memory of this fire is perpetuated in the slang of to-day. An explosion was caused by a coincidence in the contents of a warehouse which contained sugar in the upper storeys and saltpetre below. When the saltpetre came in contact with the sugar a violent explosion ensued, and for awhile spread the fire beyond all efforts to control it. This catastrophe and the controversies which followed it gave rise to the satirical question, "Will saltpetre explode?" and was followed by an ordinance forbidding its storage in quantity in the city or in vessels in the river. This Act was afterwards modified (April 14, 1851). A greater fire occurred August 4, 1869, when, by the burning of Patterson's warehouse at Lombard and Front Streets, 24,000 barrels of whisky were burned, gutted or stolen, causing a loss of about 2,000,000 dols. If other large fires have conduced to order and wiser laws, the direct result of this fire led to disorder, for the opportunity of drinking without stint or price proved too great a temptation for many and the temperance cause languished to an extent without precedent.

One of the first of the more recent conflagrations was the burning of Portland, Me., July 4, 1866. The fire was caused by a boy throwing a fire-cracker into a cooper's shop for the avowed purpose of scaring the workmen. In this respect the act was an unparalleled success, the damage being about 10,000,000 dols. The eloquent letter of John Adams, July 3, 1776, after the resolution preceding the Declaration of Independence had been passed, in which he said of the Fourth of July, "It ought to be solemnised with pomps, shows, games, sports, guns, bells, bonfires and illuminations from one end of the continent to the other, from this time forward for ever" ("Letters of John Adams to his Wife," p. 128), has many catastrophes to answer for.

The Chicago fire, October 9, 1871, was one of the largest in all history, devastating an area of 3½ square miles, and causing a loss of about 190,000,000 dols., on which insurance was paid to the amount of about 100,000,000 dols. Two hundred and fifty lives were reported lost in this fire. Thirteen months later, to a day, Boston was visited by a fire which extended over an area of 65 acres, burning the best mercantile buildings in the city and causing a damage of 75,000,000 dols., on which there was insurance to over 65,000,000 dols.

Inspection.—As in other instances, these casualties gave rise to many plans for better building laws and for the reorganisation of fire departments. In the course of such changes many acts of injustice have been perpetrated by those who did not grasp the whole force of the chain of circumstances causing these devastating fires, conditions too strong to be controlled by any one set of rules formulated at white heat after a conflagration. These cities had great fires, and will, in the nature of things, have other great fires. Conditions exist which, in the event of

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fires starting in certain localities and of any error in promptly giving the fire alarm, cannot fail to produce disastrous results.

The causes of fire are as infinite as the varying conditions of the numberless possessions of mankind, and beyond that the forces of nature contribute in no small degree to the fire loss. Whether it be the over-heated baker's oven at London, the balky cow at Chicago, the neglected waste in the engine-room at Boston, all great fires result from neglected small ones.

Every method of construction, every process of manufacture, every material in commerce, as well as every type of fire apparatus and the orderly conduct of affairs, bears some relation to the fire hazard. The function of the underwriter is not merely to give to these elements their just weight, but yet more to rise from a consideration of physical conditions to the higher and ethical questions relating to the moral hazard as measured by the probity of owners, who are always possessed of every opportunity to effect the destruction of their property by fire. The facility with which insurance can be effected, and the readiness with which losses are paid, renders incendiarism the great undetected crime of the present day.

It requires no argument to prove that the most efficient means of diminishing the amount of loss by fire is to lessen the number of causes of fire; but the best method of carrying such measures into effect is a question upon which there are legitimate differences. Inspections by men employed by associations of underwriters have given the most satisfactory results, but it may justly be queried whether this is the proper source for such an espionage over the community. These inspectors are employed by associations composed of competitors in the insurance business, and they are without any legal authority to enforce obedience to suggestions which are admittedly for the weal of all. Their requests are, for the most part, complied with, but the results are a benefit to the community, and it would appear that this service should be performed by persons clothed with authority from a municipality, as a part of the protective system which now extends protection to person and property by means of the police, the water-supply, and the fire departments, leaving to the underwriters their legitimate work of insuring property at prices based upon the estimated hazard. If the risk of destruction by fire is reduced, it will be a benefit to the community, which will be gladly recognised by underwriters in the diminution of premiums based on the new condition of affairs.

The methods of fire patrol carried on by members of the fire departments in many cities do not comply with the offered suggestions. There should be a patrol by members of the fire department, who should systematically inspect every building, searching into every preventable cause of fire, with authority to cause the proper remedies to be carried into effect. The building laws refer almost solely to the new buildings erected within a few years, but a commission like this would be able to introduce inexpensive modifications into old buildings, which would greatly modify many dangerous conditions of hazard.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

Applications for Patents.

15528. Alfred Mountain Fowler, for "Improvements in or applicable to water-closets."

15533. John Dunn and Louis Fischer, for "Improved roller for window-blinds and similar purposes."

15638. Walter Whitfield Bostwick, for "Improvements in metal lathing."

15704. Robert McAlpine, for "Improvements in the construction of dividing or partition walls for dwelling-houses or other buildings."

15724. Arthur Lloyd Clay, for "Improvements in fastenings suitable for doors."

15772. Oliver Brindley and Edwin Verity, for "Improvements in locks and latches."

15803. Robert Dennant, for "An improved domestic oven."

15836. Duncan Cameron, for "A new or improved suspended combination flush-out water-closet basin and trap."

15867. Charles Ingrey, jun., for "Improvements in stair-rod fastenings."

15933. Arthur Martin, for "An improved device for raising and lowering venetian blinds."

To Inventors.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. Rayner & Cassell, Patent Agents, 37 Chancery Lane, London, W.C.

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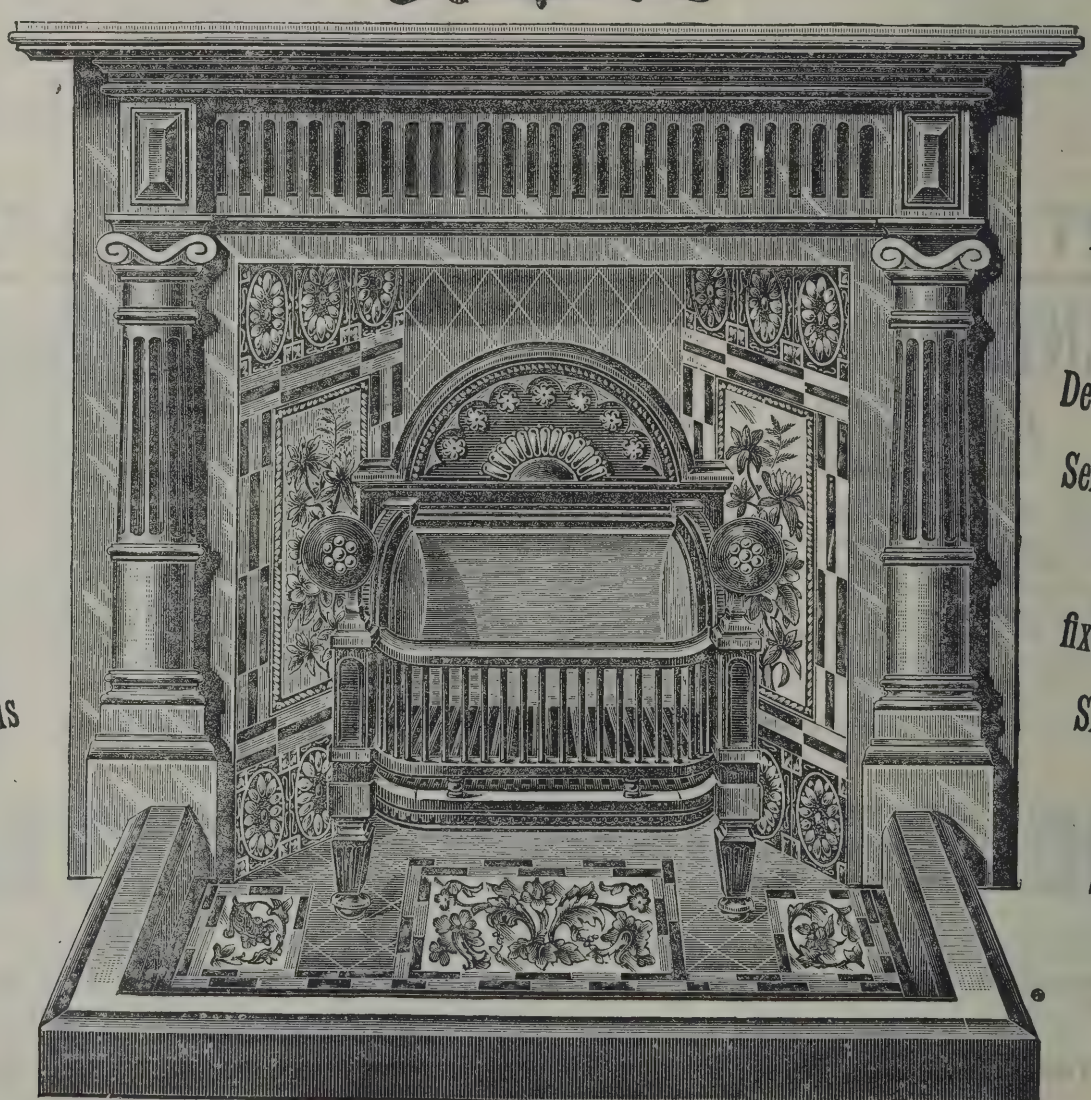
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Friday, October 2, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, OCTOBER 9, 1891.

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TENDERS, ETC.

*** *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office*, 175 *Strand, London, W.C., not later than* 5 P.M. *on Thursdays.*

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

BATH.—Oct. 31.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

BURTON-ON-TRENT.—Nov. 21.—Designs are invited for Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

FESTINIOG.—Oct. 31.—For Plans and Estimates for Electric Lighting. Mr. R. Walker Davies, Solicitor, Blaenau, Festiniog, North Wales.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

LICHFIELD.—Nov. 21.—Designs are invited for proposed Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

MERTHYR TYDFIL.—Nov. 12.—For Plans for School Buildings. Mr. E. Stephens, School Board Offices, Merthyr Tydfil.

CONTRACTS OPEN.

ABERDARE.—Oct. 12.—For Additions, &c., to Bush Inn. Mr. C. H. Elford, 15 Cardiff Street, Aberdare.

BACUP.—Oct. 14.—For Building Liberal Club. Messrs. Mangnall & Littlewoods, Architects, 29 Brown Street, Manchester.

BELFAST.—Oct. 14.—For Building Church. Mr. H. Seaver, Architect, 128 Royal Avenue, Belfast.

BELFAST.—Oct. 17.—For Additions to Covered Market. The City Surveyor.

BEVERLEY.—Oct. 16.—For Enlarging Grammar School. Messrs. Hawe & Foley, Architects, North Bar Street, Beverley.

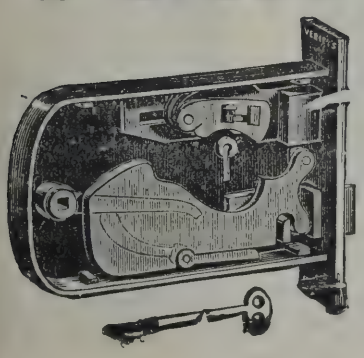
BLACKWALL.—Oct. 12.—For Constructing (by Compressed Air) and Maintaining Carriageway and Footway Tunnel under the River Thames. Mr. H. De la Hooke, County Hall, Spring Gardens, S.W.

BRISTOL.—Oct. 16.—For Extension of Avonmouth Dock. Mr. John M. McCurrick, Docks Engineer, Cumberland Basin, Bristol.

BURNLEY.—Oct. 13.—For Supply, Delivery and Erection of Sixty Tons of Cast-iron Girders. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

CARDIFF.—Oct. 17.—For Building Thirty Cottages and Construction of Road at Dinas Powis. Mr. W. H. Dashwood Caple, Architect, 1 St. John's Square, Cardiff.

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CARLTON.—Oct. 15.—For Building Six Houses, &c. Mr. Herbert Crawshaw, Architect, 1 Regent Street, Barnsley.

CATFORD.—Oct. 13.—For Kerbing, Tar-Paving, Metalling and Channelling. Surveyor, Board of Works Offices, Catford, S.E.

CHAPELTOWN.—Oct. 9.—For Building Blocks of Houses, &c. Mr. Herbert Crawshaw, Architect, 1 Regent Street, Barnsley.

COVENTRY.—Oct. 9.—For Building House and Shop. Mr. H. W. Chattaway, Architect, Trinity Churchyard, Coventry.

CRATHIE.—Oct. 15.—For Building Board School and Teacher's House. Messrs. Henderson & Son, Architects, 124 Union Street, Aberdeen.

CROYDON.—Oct. 20.—For Supply of Earthenware Drain Pipes. Borough Engineer, 8 Katharine Street, Croydon.

DOWNPATRICK.—Oct. 31.—For Constructing Waterworks. Mr. J. W. Montgomery, Union Offices, Downpatrick.

EASTBOURNE.—Oct. 13.—For Supplying Westminster Chiming Clock for the Town Hall. Borough Surveyor, Town Hall, Eastbourne.

EASTBOURNE.—Oct. 19.—For Constructing Sewers. Borough Surveyor, Town Hall, Eastbourne.

GLASGOW.—Oct. 12.—For Building Three Tenements. The Town Clerk, City Chambers, Glasgow.

HALIFAX.—Oct. 15.—For Covered Shed, Retaining Walls, &c. The Engineer, L. and Y. Railway Co., Hunt's Bank, Manchester.

HALIFAX.—Oct. 16.—For Building Fire Brigade Station. Mr. James Farrar, Architect, Crossley's Buildings, Northgate, Halifax.

HALIFAX.—Oct. 12.—For Building Seven Houses. Messrs. Lloyd & Son, Architects, 24 George Street, Halifax.

HOVE.—Oct. 26.—For Electric Lighting. Mr. Charles A. Woolley, Town Clerk, Town Hall, Hove.

HUCKNALL TORKARD.—For Building Board Schools. Mr. A. N. Bromley, Architect, Nottingham.

HUDDERSFIELD.—Oct. 13.—For Refuse Destructor Sheds. The Borough Surveyor.

ISLINGTON.—Oct. 12.—For Making-up Carriageway, Repairing Pitching, Constructing Loose Boxes and Alterations to Workhouse. Mr. J. Patten Barber, Surveyor, Vestry Hall, Upper Street, Islington, N.

LEAMINGTON.—Oct. 12.—For Supply of Broken Granite. Mr. H. C. Passman, Town Clerk, Leamington.

LEEDS.—Oct. 10.—For Building Villa Residence. Mr. L. Harris, Architect, St. Andrew's Chambers, Park Row, Leeds.

LEEDS.—Oct. 13.—For Building New Hall, Yorkshire College. Messrs. A. Waterhouse & Son, 20 New Cavendish Street, London, W.

LEEDS.—Oct. 22.—For Building School of Medicine, Yorkshire College. Mr. W. H. Thorp, Architect, 61 Albion Street, Leeds.

LEWES.—Oct. 19.—For Building Public Offices and Alterations and Additions to Municipal Buildings. Mr. S. Denman, Architect, 26 Queen's Road, Brighton.

LONDON.—Oct. 10.—For Building Municipal Lodging-house. Messrs. Gibson & Russell, Architects, 27A Old Bond Street, W.

MARGAM.—Oct. 10.—For Building Iron Girder Bridge. Mr. Wm. Thomas, Surveyor, Port Talbot, South Wales.

MELTON.—Oct. 16.—For Works for Supply of Water to County Asylum. Mr. Geo. Hodson, Abbey Buildings, Prince's Street, Westminster, S.W.

MILE END.—Oct. 15.—For Erecting Iron Balconies, Stairs, &c. Mr. Charles F. Burden, Mile End Workhouse, Bancroft Road, E.

MILLWALL.—For Rewharfing Premises. Messrs. Cutler & Sons, 16 Great George Street, Westminster, S.W.

NEWTON-LE-WILLOWS.—Oct. 17.—For Building Public Hall and Offices. Mr. Thomas Beesley, Architect, Bold Street, Warrington.

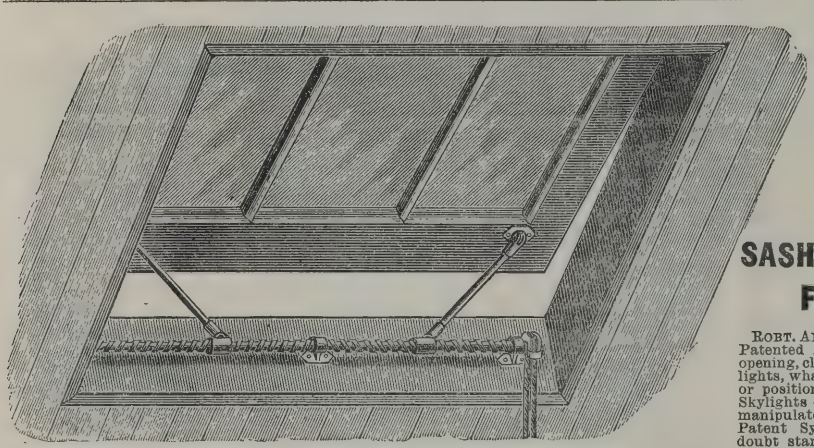
NORTH-WESTERN RAILWAY.—Oct. 13.—For Constructing Branch Railway and Footbridge. Engineer's Office, Euston Station, N.W.

PETERBOROUGH.—Oct. 21.—For Building Dwelling-house. Mr. James Ruddle, Architect, Boroughbury, Peterborough.

PRESTON.—Oct. 19.—For Building Shed, Albert Edward Dock. Mr. B. Sykes, Dock Engineer, 33 Winckley Square, Preston.

QUEENSBURY.—Oct. 17.—For Stabling, Cartshed and Conveniences at Crown Inn, Horton Bank Top. Mr. John Drake, Architect, Winterbank, Queensbury.

RAMSGATE.—Oct. 21.—For Constructing Sloping Road, Brick and Concrete Arches, Sea Wall and New Military Road. Mr. William A. Valon, Engineer, Hardres Street, Ramsgate.

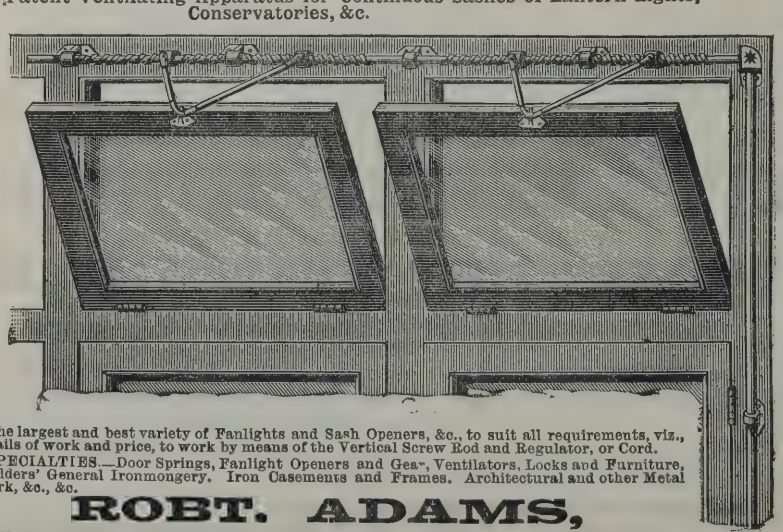


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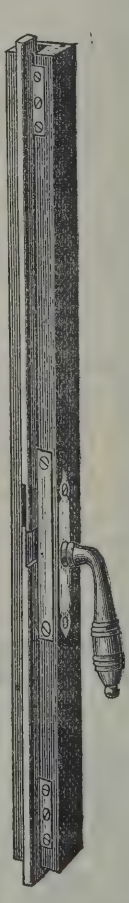
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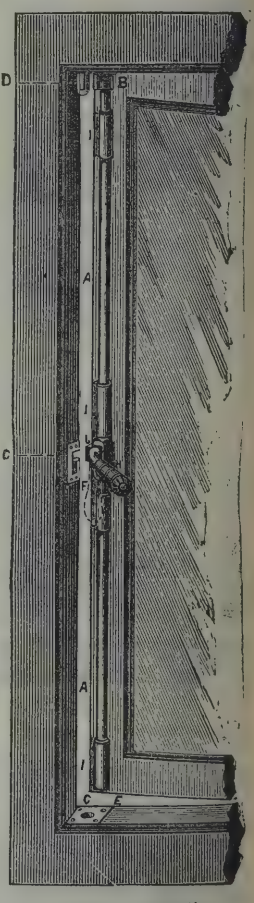




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No. 208.—Special thrust-motion round section Bolt, suitable for very narrow stiles. It can be fixed where the space is insufficient for anything else. This Bolt is neat, strong and reliable.

RAWMARSH HILL.—Oct. 17.—For Building Five Houses and Altering Premises. Mr. J. Platts, Architect, Rawmarsh Hill.

READING.—Oct. 19.—For Additions to Police Station. Mr. A. E. Collins, Borough Engineer.

ROCHESTER.—Oct. 13.—For Building Four Cottages. The City Surveyor, Guildhall, Rochester.

ROCHESTER.—Oct. 14.—For Supply of Cast-iron Pipes. Mr. Richard Prall, Town Clerk, Eastgate, Rochester.

RUNCORN.—For Building Chancel and Vestries to St. Michael's Church. Mr. Thomas D. Barry, Architect, 37 Parkfield Road, Liverpool.

RYE.—Oct. 10.—For Laying Pipes, Constructing Precipitating Tanks, &c. Mr. T. J. Smith, Clerk to the Guardians of the Rye Union, Rye.

STAFFORD.—Oct. 12.*—For Cellars, Ale Store and Stabling in Cherry Street. Mr. N. Joyce, Architect, Stafford.

SWINDON.—Oct. 10.—For Taking-down and Rebuilding 22 Wood Street. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

TOTNES.—Oct. 29.—For Adapting Grammar School for Police Station. The Superintendent of Police, Totnes.

TREFOREST.—For Building Wing to St. Michael's Home. Mr. C. C. Jones, Architect, 2 Charles Street, Cardiff.

TREWALCHMAI.—Oct. 28.—For Building Police Station. Mr. J. Lloyd Griffith, Clerk of the Peace, Stanley House, Holyhead.

WARRINGTON.—Oct. 17.—For Building Public Hall and Offices. Mr. Thomas Beesley, Architect, Bold Street, Warrington.

WILLESDEN.—Oct. 13.—For Constructing Sewer with Manholes, Ventilators, &c., and for Supply of Broken Granite and Making-up Carriageways and Paving Footways. Mr. O. Claude Robson, 299 High Road, Kilburn, N.W.

WORKINGTON.—Oct. 14.—For Building 12-Stalled Stable, Coach-house, Harness-room, Workshop and Offices. Mr. W. G. Scott, Architect, Workington.

YEOFORD JUNCTION.—Oct. 15.—For Building Church. Rev. Thomas Russell, Victoria Road, Barnstaple.

* Names and addresses to be forwarded not later than date.

TENDERS.

BANBURY.

For Surface Drainage, Levelling, Channelling, Kerbing, Paving, Flagging and Macadamising Castle Street East, Banbury. Mr. S. E. BURGESS, Borough Surveyor.

Claridge & Bloxham, Banbury	£606 16 0
J. S. Kimberley, Banbury	599 0 0
J. Grant, Banbury	565 0 0
S. ORCHARD & SON, Banbury (*accepted*)	554 0 0
Surveyor's estimate	589 10 10

BRISTOL.

For Erection of a Pair of Semi-detached Villas in Rokeby Avenue, Alexandra Park Estate, Redland, Bristol, and Pair of Semi-detached Villas, Montrose Avenue, for the Bristol Capitalists' Association, Limited, Stephen Street, Bristol. Mr. A. BARRATT, Surveyor, Somerset Chambers, Corn Street, Bristol.

Rokeby Avenue.

Assets Purchase Co., Bristol	£1,177 0 0
E. Love, Bristol	1,075 0 0
W. Podger, Bristol	1,050 0 0
A. TAMBLING, Bristol (*accepted*)	1,020 0 0

Montrose Avenue.

A. Tambling, Bristol	£1,262 0 0
Assets Purchase Co., Bristol	1,196 0 0
D. Morris, Bristol	1,185 0 0
E. Love, Bristol	1,150 0 0
W. PODGER, Bristol (*accepted*)	1,145 0 0

CLACTON-ON-SEA.

For Erection of a Private Hotel on the Marine Parade, Clacton-on-Sea, for Mr. John Jones, J.P. Mr. W. A. FINCH, Architect, 76 Victoria Park Road, London, N.E.

E. A. West	£4,243 0 0
G. Dobson	4,180 0 0
A. Porter	3,867 0 0
J. Grimes	3,830 0 0
Everell & Son	3,769 0 0
W. Sargeant	3,340 0 0
N. DE MAID, Clacton (*accepted*)	3,220 0 0

Awards—Gold Medal, Saltaire, 1887; Silver Medal, Brussels, 1888; Silver Medal, Paris, 1889; Gold Medal, Brighton, 1889

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We remain, Gentlemen, yours obediently, **J. H. PICKUP & CO.**

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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C. C. Dunn, Cardiff.	23,942 12 7	1,781 4 5	821 5 10
Thomas & Son, Cardiff.	23,208 0 0	1,983 0 0	1,675 0 0
Brown & Blackman, Liverpool	23,083 0 0	1,462 0 0	1,215 0 0
Stephens, Bastow & Co., Bristol	22,499 0 0	1,£00 0 0	700 0 0
Bowers & Co., Hereford	22,490 0 0	1,547 10 0	1,432 0 0
J. Hopkins, Cardiff	22,265 12 7	1,421 17 1	1,459 10 9
Burton & Co., Cardiff.	21,578 0 0	2,100 0 0	1,000 0 0
Turner & Co., Cardiff.	20,705 0 0	1,470 0 0	1,145 0 0

CHURCH STRETTON.

For Erection of Infirmary, for the Church Stretton Union, Salop. Mr. A. B. DEAKIN, Architect, Shrewsbury.

H. Welsh, Hereford	£984 0 0
G. H. Bickerton, Ford.	800 0 0
Higler	793 0 0
JOHN GETHIN (*accepted*)	793 15 0

COCKINGTON.

For Constructing Sea-wall, Cockington, for the Devon County Council.

F. W. VANSTONE (*accepted*)	£1,289 0 0

COVENTRY.

For Building Premises, Little Park Street, Coventry, for Mr. William Middlemore. Mr. HERBERT W. CHATTAWAY, Architect, Trinity Churchyard, Coventry.

C. Haywood, Coventry	£2,070 0 0
C. G. Hill, Coventry	1,833 0 0
C. GARLICK, Coventry (*accepted*)	1,730 0 0

COCKERMOUTH.

For Building Stable and Cartshed, with Hayloft over, and Fire-engine House, in the Fairfield, Cockermouth. Mr. R. S. MARSH, Surveyor.

Accepted Tenders.

Wren & Lindsay, mason and waller	£144 2 6
Grave & Son, joiner	46 3 0
J. Bolton, slater	18 13 0
J. Waller, plasterer	13 15 0
H. Ritson, painter and glazier	5 14 9
D. Bell, plumber	4 16 6

EDGBASTON.

For Erection of Residence, Sandon Road, Edgbaston, for Mr. Thos. Burns. Mr. BRADFORD TOMLINSON, Architect, Coventry. Quantities by Architect.

Taylor Bros.	£973 0 0

HAILSHAM.

For Building Cemetery Chapel, Hailsham. Mr. OLIVER MITCHELL, Architect, Eastbourne. Quantities not supplied.

W. Gardner, Eastbourne	£397 0 0
D. Ashdown, Hailsham	389 0 0
A. Hall, Hailsham	362 10 0
Cornwell & Son, Eastbourne	362 0 0
JOHN VINALL, Eastbourne (*accepted*)	300 0 0

HOUGHTON-LE-SPRING.

For Laying-out Hetton Lane Cemetery, Houghton-le-Spring.

Dixon, Houghton	£2,206 0 0
Carrick, Durham	2,201 0 0
Simpson, Newcastle	2,153 16 1
Hudson, Sunderland	2,050 0 0

KINGSTON-ON-THAMES.

For Classrooms and Laboratory at Tiffin's Boys' School, Kingston-on-Thames. Mr. EDWARD CARTER, Architect.

Henley & Sons	£1,173 0 0
Loveland	1,035 0 0
Oldridge & Sons	1,028 0 0
Lane & Son	1,008 0 0
Adkins Bros.	998 0 0
Collings	949 0 0
Gaze	937 0 0
Constable	877 0 0
MERREDEN (*accepted*)	855 0 0

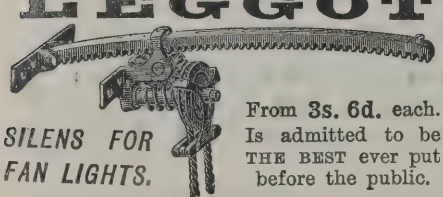
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POWNALL ROAD, DALSTON.
Telephone No. 1140.

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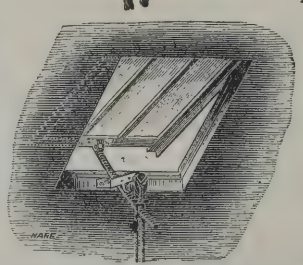
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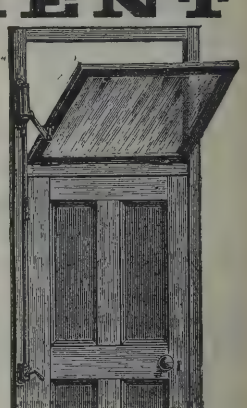
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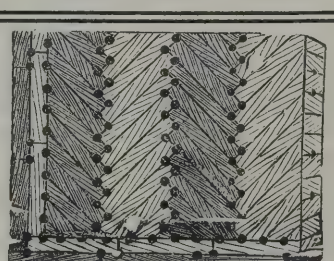
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For Pewterers' Work to the King's Arms, Glasshouse Street, Regent Street, for Messrs. Porter & Co. Mr. H. I. Newton, Architect, 49 Victoria Street, Westminster.

Sanders & Son, High Holborn (*accepted*).

For Extension of Laundry Buildings at the North-Western Fever Hospital, Haverstock Hill. Messrs. Pennington & Bridgen, Architects. Quantities by Mr. Farthing.

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Calnan & Co., Commercial Road	3,000 0 0
Godfrey & Son	2,897 0 0
Aaron & Salter, Roderick Road	2,847 19 9
Henry Fowler, Hampstead	2,825 0 0
Rowe Bros., Camden Town	2,817 0 0
G. A. & H. Wall, Kentish Town	2,524 0 0

PEVEREY.

For Erection of Three Lodges on the Peverey Estate, Salop, for Sir Offley Wakeman, Bart.

W. Bowdler & Co., Shrewsbury	£945 0 0
H. Barker, Craven Arms	897 0 0
R. Price, Shrewsbury	893 10 0
J. Gethin, Shrewsbury (*accepted*)	838 15 0

STOKE.

For Erection of House, Stoke, near Coventry, for Mr. Jansen. Mr. Bradford Tomlinson, Architect, Coventry.

Gough	£427 0 0

RISCA.

For Erection of Police Buildings at Risca, Mon. Mr. William Tanner, County Surveyor for Monmouthshire, Architect. Quantities by Architect.

T. G. Diamond, Newport	£3,680 0 0
Morgan & Evans, Pontnewynydd	3,525 0 0
J. McCarthy, Newport	3,301 0 0
W. Price, Newport	3,265 0 0
Charles West, Newport	3,150 0 0
John Linton, Newport	2,899 0 0
Surveyor's estimate	3,030 0 0

STREATHAM.

For Alterations at the Streatham Common Branch of the London and South-Western Bank. Messrs. Tolley & Son, Architects. Quantities by Messrs. Parr & Son.

	A	B
Candler & Son	£1,493 0 0	£1,145 0 0
Smith & Son	1,488 0 0	1,135 0 0
Mason	1,475 0 0	1,125 0 0
Walker	1,446 0 0	1,029 0 0
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W. Nicholls, Wood Green	190 0 0
S. Kavanagh, Tolworth	175 11 0
W. Cunliffe, Kingston-on-Thames (*accepted*)	166 10 0

SWANSEA.

For Alterations and Additions to Premises in Orchard Street, Swansea, for Messrs. Simonds, The Brewery, Reading.

P. Jones & Son, Swansea	£225 0 0
The Nelson Joinery Co., Swansea	225 0 0
J. Richards, Swansea	228 12 0

WARRINGTON.

For Building Chapel at Warrington. Mr. Robert Parry, Architect, Rochdale. Quantities by Architect.

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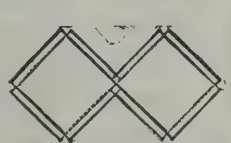
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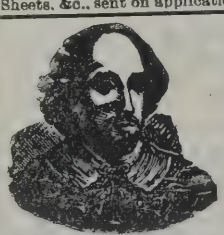
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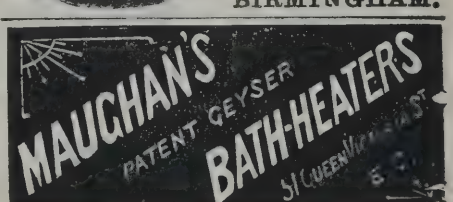
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Gregar & Sons, Stratford	19,260	0	0
W. J. Maddison, Canning Town	19,100	0	0
J. Morter, Stratford	18,990	0	0
B. E. Nightingale, Albert Embankment	18,667	0	0
J. Holland, Poplar	18,585	0	0
A. Kellett, Willesden	18,125	10	0
Perry & Co., Bow	17,997	0	0
ALLEN & SON, Kilburn (*accepted*)	17,150	0	0

NOTE.—The names of those in italics declined the conditions of contract advertised by the Corporation, viz., that the rate of wages and hours of labour should be such as are "determined by the London Trades Council," and substituted the conditions agreed between the Royal Institute of British Architects and the Association of Master Builders.

For Fencing Silvertown Sewerage Works, &c., for the West Ham Town Council.

Scotney & Co., Plaistow	£330	12	0
J. R. Hunt, Bow	284	0	0
J. Jackson, Plaistow	250	0	0
G. Barber & Co., Milton Street, E.C.	247	17	0
D. Barfoot, Silvertown	247	15	6
A. Carter, Plaistow	245	0	0
Watson & Hiscox, Woolwich	209	19	8
C. H. Binney, Ilford	200	11	9
J. J. Blanch, Plaistow	199	0	0
M. Marshall, Godalming	195	0	0
ROWLAND BROS., Fenny Stratford (*accepted*)	180	15	6

WESTHAUGH.

For Construction of Iron and Stone Bridges, Making Road and Works in connection at Westhaugh, near Alva, for the Clackmannan County Council. Mr. H. LAKE, Surveyor, Claremont, Alloa.

J. M. Pearson, Kilmarnock	£2,140	16	3
Hills Bros., Alloa	1,736	7	11
W. Cristie & Son, Paisley	1,650	19	0
G. & R. Cousin, Alloa	1,456	17	5
A. Gall, Alloa	1,337	9	8
J. Walker, Alva	1,263	6	7
J. THOMSON, Alloa (*accepted*)	1,248	0	2

STEEL CHIMNEYS.

STEEL chimneys are being erected in connection with some of the lofty buildings in Chicago. The Fair building has at present the tallest under construction. The chimney, when completed, will be 250 feet high, being considerably higher than any other in the city, the highest at the present time being the one at the Gottfried Brewing Company's plant at Archer and Stewart Avenues, which is 175 feet. The outside diameter is 9 feet 5 inches, while the steel varies in thickness from $\frac{5}{32}$ at the top to $\frac{3}{8}$ inch at the bottom. The lower 75 feet of the chimney is lined with fire-brick 8 inches deep, formed to fit the shell compactly all round. Above this it is lined with hollow tile. This lining is supported at intervals of 25 feet by angle-iron rivetted to the steel shell; in other words, the chimney is lined in a manner similar to blast furnaces and foundry cupolas, and no expansion by heat can lessen its strength. The joints are all hot rivetted. The steel shell is carefully protected from corrosion and from any attacks by the weather by painting inside and out. The weight of the chimney is spread to the foundations in the same general way as that of the columns of the building, the base or foundation on which it rests being constructed in the same manner. The ground is first covered with a layer of cement, then two layers of steel rails in cement and one layer of I-beams, on which the cast-iron shoe which takes the shell of the stack rests. The capacity of the chimney is twelve 60-inch boilers 20 feet in length.

This is the first time this material has been used in the construction of the chimneys of mercantile buildings. The magnitude of the building and the necessity of economising in space, the foundations for the columns occupying about all the ground, led the architects to adopt steel as the material for this purpose. Brick has been used almost entirely heretofore, but upon investigation it was found that the weight of a brick chimney of this size would be almost 700 tons, while of steel construction it would weigh, including the linings, a little less than 250. The outside diameter of the present chimney is 9 feet 5 inches, while, were it constructed of brick, it would be 16 feet 6 inches, thus making a great saving in space. Another consideration was the time consumed in construction. A brick chimney of this height, 250 feet above the sidewalk, should not be built faster than 2½ feet a day on account of the settlement and the setting of the mortar, while of steel

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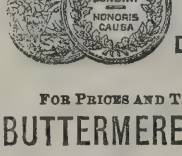
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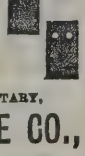
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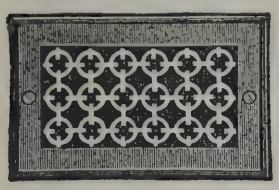
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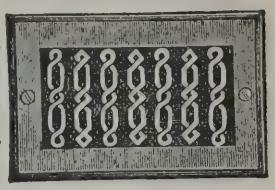
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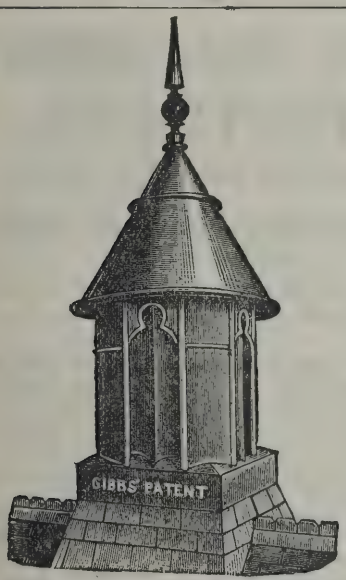
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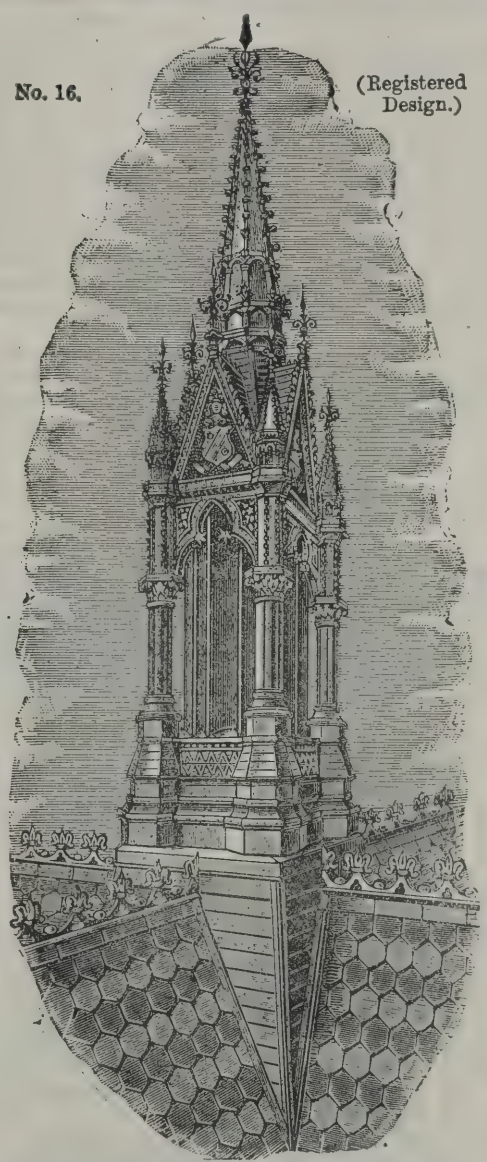


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it can be erected at the rate of 20 feet a day. Another important consideration is that it costs only about 60 per cent. of what a brick chimney would cost. Steel has been used in the construction of chimneys for iron mills and factories.

TRADE NOTES.

MR. JOHN GRUNDY, of 30 Duncan Terrace, London, N., is supplying his patent warm-air ventilating firegrates to the Brettenham Board School.

MR. J. E. NORTON (late of the firm of Hindle & Norton) has commenced business, after a dissolution of partnership, at St. Mary Street, Oldham, where he will continue to manufacture the "Acme" and "Paris" spring hinges.

A NEW system of stable drainage has been brought out by Mr. A. J. Bewick Ward, 15 Great George Street, S.W., which does away with all urine-trapped pots in the stable, with a specially-designed interceptor outside. They are well planned, simple in construction and easily fixed. Architects and others having stablework in hand should write for particulars, as they are a step in the right direction and a valuable improvement in sanitation.

MR. MORGAN WILLIAMS, A.M.I.C.E., M.A., formerly installation engineer to the Electrical Power Storage Company and the Electric Construction Corporation, has now entered into partnership with Mr. Frank King, M.I.E.E., and the firm are practising as consulting electrical engineers under the title of Messrs. Morgan Williams & King at 39 Victoria Street, Westminster. Messrs. Morgan Williams & King intend taking up in electric lighting matters a position precisely similar to that of an architect in relation to their clients.

THE new schools, Taunton, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

THE advice has been taken of an electrical engineer with a view to the laying down of plant for supplying electricity for lighting the borough of Accrington, and a report will shortly be submitted to the Town Council.

AN interesting series of experiments lately took place on the Southwark and Vauxhall Waterworks Company's premises, Battersea, when an exceptionally powerful steam fire-engine, constructed to afford more effectual protection against fires in the lofty buildings erected in Sydney, N.S.W., was publicly tested in the presence of Sir Saul Samuel, K.C.M.G., Agent-General for New South Wales, the inspecting engineer appointed by the Sydney Fire Brigades Board, representatives of the insurance companies and others. Steam was raised to 100-lb. pressure in 10 minutes 24 seconds, and various jets up to $1\frac{3}{4}$ inch were thrown, the last-mentioned reaching to a distance of 318 feet. Afterwards four 1-inch streams were thrown simultaneously to a great distance. The engine has a capacity of 1,000 gallons per minute, and has been built by Messrs. Shand, Mason & Co., of Blackfriars, London. The trial gave very great satisfaction, much astonishment being expressed at the force and solidity of the streams, and the distance to which they were thrown, coupled with the smoothness and ease with which the engine worked throughout the tests. This powerful extinguisher will leave for its destination very shortly.

WE understand that Mr. C. H. Mabey has moved from 1, 1A and 2 Princes Mews, Westminster, to more convenient premises, viz. 150A Vauxhall Bridge Road, about five minutes' walk from Victoria Station.

A REPORT has been presented to the Halifax Council meeting by Mr. J. H. Woodward, of Wolverhampton, with respect to the construction and working of a central station in Halifax for supplying the electric light. The report proposes to locate the central station at the late Salvation Army barracks, Stead Street, and that it should be worked by steam-power. The estimated capital outlay is put down at 52,594*l.*, and the estimate of running expenditure at 7,508*l.* 5*s.* per annum.

THE work of putting in a new cable for the Highgate Hill Cable Tramway has just been completed, the old cable having become defective through wear and tear. It required thirteen horses to draw the new cable on a Midland Railway trolly up the steep hill on which the tramway is laid to the company's depôt on Friday.

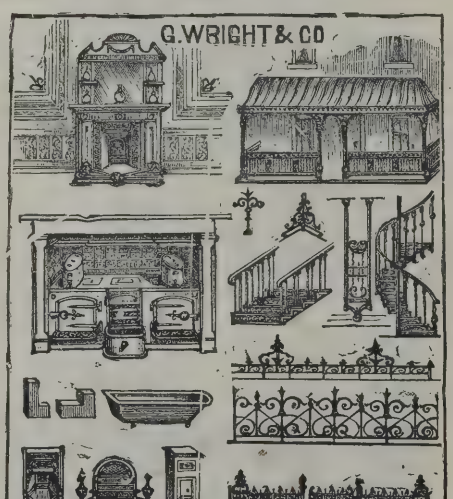
THE matter of the alleged breach of contract with Messrs. William Gray & Sons, Frederick Street, has been considered by the Law Committee of the Edinburgh Town Council. A draft report was submitted from the Public Health Committee, and after considerable discussion the Law Committee were of opinion that it was quite within the competency of any committee to order work and furnishings from persons other than

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the contractors, in terms of condition 2 of the general specification relative to city contracts.

At a private conference of gentlemen interested in the question of refuse-destructors held in Edinburgh, Professor Forbes, London, who, it is understood, has made a special study of the subject, submitted and explained some plans of refuse-destructors, which were found to correspond pretty closely on their general lines with the plans prepared by the Edinburgh burgh engineer. Professor Forbes also spoke in favour of the steam-power of destructors being utilised in connection with electric lighting.

At the meeting of the Wenlock Town Council a report was submitted from the Repairs to the Guildhall Committee, who had received tenders for the work specified by Mr. Lloyd Oswell, the architect, ranging from 680*l.* to 588*l.*, the lowest being from Mr. Bowdler, of Shrewsbury. This tender had been reduced by 118*l.* by substituting deal for oak and other slight alterations. This was accepted.

At Yarmouth the last block of concrete has just been placed into position in the new quay head at the Fish Wharf. The work has been all along under the personal supervision of the town surveyor, Mr. John W. Cockrill. The first block of concrete (of which the main portion of the quay heading consists) was made on March 25 last year, and from that date down to August 13 in the same year a large gang of men was employed in preparing the river bed at the side of the quay, erecting cranes and other necessary preliminaries for the proper carrying out of the work. On the latter date the first block was laid. The length of the new structure is 2,103 feet, and the depth 26 feet; the actual number of blocks laid is 4,780, the cubic contents involving the making of 12,281 cubic yards of concrete. The concrete wall is faced with granite, of which stone about 2,000 tons have been used. The total estimated cost was 26,000*l.*, but from statistics at present to hand it is believed that the cost will not exceed 24,000*l.* The old wooden quays have been all but renewed three times during the past twenty-five years, the cost being equal to the present work, and involving latterly a cost of some 500*l.* a year for dredging and repairs.

The Town Council of Kilkenny have accepted the proposal of Messrs. Waller & Manville to supply an estimate of the cost of the introduction of electric light into Kilkenny.

An application is to be made by the Town Clerk, Birkenhead, for sanction to borrow the sum of 1,999*l.* for the purchase of land in Livingstone Street and Price Street, as a site for one of the proposed refuse destructors, and a further sum of 3,300*l.* for the purchase from Mr. A. P. French of a piece of land containing about 8,000 square yards between New Chester Road and the Mersey as a site for the refuse destructor for Tranmere.

Tenders for lighting the township of Bray by electricity have been sent in to the commissioners.

At the Clerkenwell Police-court on the 7th inst., Mr. G. H. Croad, Clerk to the London School Board, was summoned by the Clerkenwell Vestry for neglecting an order to remedy the defective drainage of the caretaker's house at a Board-school. For the defence it was pleaded that, owing to the holidays, the matter had been overlooked. A fine of five pounds was imposed.

The Vestry for St. Pancras have resolved to reconstruct the sewers in Upper Woburn Place, on the east and south sides of Tavistock Square, on the west side of Gordon Square, in Gordon Street, Endsleigh Street and Endsleigh Gardens. Public pressure has been brought to bear on the Vestry.

The new and improved patent ventilators of Baird, Thompson & Co., the well-known ventilating and consulting engineers, of London and Glasgow, are being favourably received by the leading architects and others, and in order to keep pace with the growing demand they are making extensive additions and alterations to their present works, and in addition have leased new premises in Holloway, within which they are at the present time busy completing and laying down specially-prepared plant and machinery wherewith to turn out in still larger quantities the ventilating, heating and sanitary appliances which form the specialties of the firm. In these the firm have attained a prominent position, and they are justly celebrated both for their efficiency and first-class workmanship. The firm at present have numerous important contracts on hand, and their latest improved patent self-acting exhaust roof ventilator and their improved fresh-air inlet panel ventilator have recently been applied to numerous leading public and private buildings both at home and abroad. The extended works above referred to will be under the management of Mr. Robert Pollock, formerly and for many years manager of Robert Boyle & Son, of London and Glasgow, and a gentleman of extensive and varied experience. It is to be noted that a representative of Baird, Thompson & Co. is at present making a journey through the United States and Canada, and carrying through some important special contracts for the firm, besides extending the knowledge of their specialties generally. The head of the firm, Mr.

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J. D. Gray Thompson, is at present engaged on an important sanitary treatise soon to be published, and expected to prove of the highest interest to all connected with sanitary science. The firm's revised catalogue is to be had on application at the London or the Glasgow office.

BUILDING AND BUILDERS.

A beginning has been made to restore the jute warehouses in Trades Lane, Dundee, which were recently damaged by fire. The two buildings, which were almost wholly destroyed, are not to be proceeded with meantime, and operations will be confined to the adjoining premises. Bailie M'Culloch is the architect.

At the meeting of the Wolverhampton School Board amended plans for the proposed Higher-grade School were submitted. Alterations had been effected to reduce the cost 2,500*l.*, so that the buildings would not cost more than 12,000*l.* The plans, subject to the sanction of the Education Department, were adopted.

The *Durham Advertiser* says:—The County Council are now replacing three of the old stone bridges in Weardale by girder bridges. White's Bridge, of one large arch, over the Wear between Westgate and St. John's Chapel, has been taken down, and the new piers are now ready for the girders. This bridge was built in 1745, and consisted of one narrow arch, an additional arch being added in 1803. Ireshopeburn Bridge, of one arch, and over a tributary of the Wear, has been taken down and the piers built, and the girders are being replaced. The third is that of the Wearhead Bridge, of two arches, and which still stands, but will be very shortly taken down. The picturesque old structure was built in 1768, and was widened by an additional arch in 1810. The ascent and descent on and from these bridges were highly dangerous, especially in winter

In connection with the parish of St. Michael and All Angels, Northampton, about 2,000*l.* is to be spent in the addition of further buildings to the already existent parochial room and schools. They are to consist of a large ground-floor hall, with stage or platform 82 feet by 39 feet in dimensions; two class-rooms at the Perry Street end of the structure on the same level; a couple more 20 feet square classrooms on the first floor; and kitchen, scullery and heating chamber in the basement. Mr. C. Dorman is the architect, and Messrs. Sharman the builders. The building will be of brick with Bath stone dressing, and designed to match with the church and present buildings.

A site has been secured at Clayton Heights, Queensbury, on which to erect a new Wesleyan school.

The committee of the Aston Technical School have decided to purchase a site in the Whitehead Road, and to erect upon it a suitable building in which to carry on their work. The cost of the site will be about 850*l.*, and it is roughly estimated that the whole scheme would necessitate the outlay of about 6,000*l.*

The Free Library Committee of the Nelson Town Council have decided to apply to the Local Government Board for sanction to borrow 7,500*l.* for the purpose of erecting a technical school and free library combined.

The markets committee of the Leeds Corporation have had before them plans prepared by Mr. Hewson, the borough engineer, for roofing in a portion of the Kirkgate Market at present unprotected. Although scarcely forming a portion of the market proper, the land to be so treated has been used on market-days by stallholders, and as they have experienced considerable inconvenience in rainy weather, the improvement is a most desirable one. The roof is to be of iron and glass, and will be constructed on the same principle as that of the Midland Railway Station at Bradford. Instead of one huge roof with large spans, the structure will consist of a system of iron girders supported on pillars very large distances apart, the girders in their turn carrying a series of small spans of roof.

In a letter to the *Leeds Mercury*, Messrs. Maxwell & Tuke, the architects of the Blackpool Tower, say:—The directors have decided to proceed with the erection of the tower at once, and the ironwork quantities are already taken, and the contracts will, we expect, be actually let within a fortnight. The work will be in operation before the end of the present month, and a great portion of the tower will be completed by July next. It may be interesting to your readers to know that in the matter of the London Tower, which is to be 1,000 feet high and will weigh 7,000 tons, no contractor has been found to undertake the completion in less than two years and a half from the time of signing the contract. Taking this into consideration, it is difficult to imagine how the rival tower, which h s only been dreamed of since the Blackpool Tower has been paut before the public, and which, we understand, is also to be



1,000 feet high, can be completed before our own, which is only half the height, and will not contain one-quarter the metal.

The Aberdeen harbour engineer, reporting on the foundations of Waterloo Quay, says :—"I propose to drive a row of greenheart or Jarrah timber sheet and bearing piles along the whole length of this wharf at a distance of 8 feet from the present front, the bearing piles to be driven to the boulder clay 11 feet deeper than the present piles, and the sheet piles into the gravel 7 feet deeper than the existing sheet piles. The space between the two rows of sheet piles to be deepened a foot and filled in with a mass of plastic concrete 8 feet wide by 9 feet deep. The weight of the concrete, 4½ tons per lineal foot, and the extra depth of piling, will allow the berth alongside to be deepened to the level of 26 feet at high water, and, with the addition of a row of anchor piles in the quay securing the top of the front piles, will make the quay wall permanently safe. The wharf would be extended to a total width of 18 feet, the cope lifted, the granite causeway extended to the front of the wharf and the rails shifted outwards. I estimate the cost of the extension of the wharf a length of 320 feet at 2,700*l.* The remainder of the length of Waterloo Quay westward 278 feet is secured by sheet piling 4 feet, and bearing piles 6 feet deeper than the eastern portion, and I consider it perfectly safe for the existing depth of berths. In consequence of the continued movement forward and subsidence of the portion of Waterloo Quay wall now under repair, the dam has had to be extended from 50 feet to 120 feet. On the completion of this part of the wall the dam will be taken down and a portion of it re-erected westward 70 feet. I propose to continue the wall in a straight line and build the west-end of this part of the wall in front of the existing wall to stand out 12 feet in order to strengthen the wall and give a square butt end to the timber wharf. The length of wall to be taken down and rebuilt is now found to be 160 feet (instead of 90 feet), and the estimated total cost, 3,500*l.*" The committee approved of the report.

VARIETIES.

The Gas Committee have instructed the town clerk to apply for sanction to borrow the sum of 60,000*l.* for proposed extensions of the Halifax Gasworks.

The South Stoneham Board of Guardians have received seven sets of plans for the proposed sewerage and sewage-disposal of Eastleigh.

The special autumn fashion number of the *Lady's Pictorial* is a wonderful production, containing over 150 pages, most lavishly illustrated with designs of the latest fashion in autumn dress.

The engineer to the Dover Board, Mr. Walmesley, together with Mr. Webster and Mr. Thorne, architect and contractor respectively for the Dover Promenade Pier, have fixed the position for the commencement of the work of building the pier, which will be carried out a thousand feet from the centre of the bay. A spacious pavilion will be erected at the end of the pier.

The Cambridge Town Council have adopted the scheme of Mr. John T. Wood, of Liverpool, for the redrainage of the borough at an approximate cost of 100,000*l.* Mr. Wood has also been called in to advise the Chesterton Local Board, who are desirous of joining the Cambridge scheme.

A report has been presented to the Dunfermline Police Commissioners by Mr. R. C. Reid, C.E., Edinburgh, upon the drainage of the burgh. Mr. Reid condemns the present system as inadequate, and advises that two sets of pipes be laid, so as to separate the surface-water from the sewage. A number of the old pipes, he proposes, should be utilised for conveying the surface-water, and new pipes provided for the sewage. The estimated cost of the alterations is 13,700*l.*

At a meeting of the Lord Provost's committee of the Edinburgh Town Council a statement was made as to the work of restoring and improving certain historical monuments in Greyfriars' Churchyard, which, for some time past, Mr. Morham, the city superintendent of works, has been carrying on. Mr. Morham asks authority to proceed further with the work.

At the meeting of the Dundee Water Commissioners objection was made to the proposal to lift, as an experiment, a quarter of a mile of the old Lintrathen pipe in the Valley of Strathmore, and substitute thimbles for the faucets, at an estimated cost of about 3,000*l.* The pipes were weak, it was stated, and the only satisfactory plan was to lift them altogether and relay them between Pitnappie and Clatto, where the pressure was not nearly so great. Ex-Provost Ballingall said that of one hundred bursts which had taken place, only in three cases had the pipe not given way at the faucet. If the experiment resulted satisfactorily, they would probably substitute thimbles for the fancets of the remaining four miles of piping, which would cost from 6,000*l.* to 8,000*l.* The proposed

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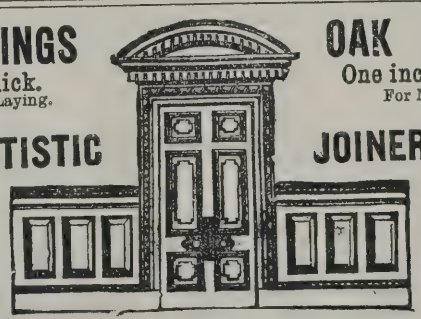
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experiment was agreed to by 20 votes to 4. The Commission resolved to complete the second Lintrathen main by laying another pipe between Pitnappie and Dundee, at an estimated cost of 29,282*l.*

DELEGATES of the joint authorities of Rhyl, St. Asaph and Abergele, have decided that steps should be at once taken with the view of promoting a Bill in Parliament for the compulsory acquisition of the Rhyl and district water undertaking for the supply of water for domestic, general and sanitary purposes within the respective districts.

AT a conference of medical officers of health at Leeds, the building of "back-to-back houses" was condemned, and also all houses that do not admit of thorough ventilation from opposite sides. The meeting pledged itself to use every effort to prevent the erection of any more such unhealthy dwellings.

THE Tees Commissioners propose next Parliamentary session to seek power to raise an additional 150,000*l.*, of which 80,000*l.* is to be spent in dredging operations to improve the draught of water, and for making the proposed railway on the north side of the river, for straightening the river, and for works of reclamation.

AT Penge a movement is on foot to secure the establishment of public baths. There is also a movement in the neighbouring parish of Beckenham for public baths and a free library.

AN inquest has been held regarding the death of Mr. John Cochrane, the contractor for the tunnel under the Mersey at Fidler's Ferry, through which the pipe line is to be passed. Mr. Cochrane shot himself in his London office, and the coroner's jury gave a verdict of suicide whilst temporarily insane. Evidence was given to show that the deceased was much worried about business matters, and it is believed a full share of his troubles arose from the unfortunate Fidler's Ferry undertaking.

IT has been decided to appoint a special committee to consider the desirability of establishing a cottage hospital in connection with the Stourbridge Dispensary.

THE Corporation of Barnsley have given notice of intention to apply to the Local Government Board for an order giving them the power to take, compulsorily if necessary, the property in New Street which will be required to make the improvement contemplated in that street. The whole of the property on the south-east side of the street has been scheduled, and it is expected that the gross cost will be 15,000*l.*, the net cost to the town being probably 10,000*l.*

MR. E. G. HUTCHINGS writes :—"Whilst reading the article in your paper *re* the smoke nuisance of London and the best means of abating the same, it occurred to me that since gas, water, sewage and other things are conveyed underground, could not a similar means be brought into use for the disposal of smoke, *i.e.* by a system of underground shafting with the flues of furnaces connected thereto and drawn or driven along the mains by fans or other means away into the country? I am well aware that, if such a plan were at all practicable, the obstacles in the way and cost would be prodigious. The idea perhaps is altogether ridiculous in the extreme, or it may have been suggested before. I am not aware that it has."

THE Penistone Local Board, Yorkshire, have arranged to supply a large quantity of water to several adjoining districts, and it will be necessary to put down additional duplicate pumping machinery, and otherwise alter and extend their works to provide the additional supply and prevent the possibility of a breakdown. The Local Board have called in Mr. W. H. Radford, C.E., of Nottingham, to report on the present system, and advise them as to the proposed works.

ABERDEEN UNIVERSITY.

THE *Aberdeen Free Press* reproduces the following extract from an article on "Extension of the Buildings," one of the series of papers on "The Progress of Aberdeen University during the Last Thirty Years," contributed to that journal by Emeritus Professor Struthers :—

The questions are, What new buildings are required? where they should be placed? and how the funds are to be procured? The first necessity is a new chemical laboratory. It is not creditable to Aberdeen at this time of day to have little else than a series of dungeons for a subject so important not only in a school of science, but to the material interests of the district. Beyond all question that is the most pressing requisite. That will require 10,000*l.*, and to do it handsomely 3,000*l.* should be added to provide an annual sum for apparatus and laboratory expenses. For that purpose 5,000*l.* would not be too much, giving an annual sum of 150*l.* Next, if Aberdeen wishes to have a complete school of the physical and biological sciences, the department of physics should be provided for alongside of the chemical department, at Marischal College, if that is to be the site. I do not say this merely because after this year physics



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will come within the medical curriculum. I said in my evidence before the Royal Commission of 1876, "I think that not having natural philosophy besides the other sciences in Marischal College was the one mistake of the arrangements at the time of the union of the two colleges," and "I hope this will be rectified when the day comes for extending the buildings of Marischal College." The clearing-out of that department from the present buildings at King's College would give what additional room may be required there. Professor Niven could say more exactly, but I doubt whether a physical laboratory worthy of Aberdeen would cost much less than the chemical laboratory, but the laboratory part proper of it would not require to be so large as for chemistry. There is already the Mrs. Neill Arnott gift of 1,000*l.* to provide an annual sum for apparatus, but that is insufficient.

As to the wants of the medical school proper, apart from the above. The recent addition made by the Government along the outside of the south side of Marischal College has given full accommodation for several of the departments. A like addition along the north side would give more accommodation than is required for the remaining departments, and at the same time provide accommodation for the growth of the science and medical parts of the library kept at Marischal College. I would like to remark here on what seems to me the want of guiding principles in regard to the arrangement and size of the rooms for the medical departments. The Botanical Department should have been provided for beside the Natural History Department, so that the museums for geology, zoology and botany would be continuous or contiguous, thus devoting the south wing to the natural sciences along with physiology, leaving the north wing, with its future extension, to provide for the professional subjects, with a general museum for these subjects. When the north wing is extended such an arrangement should be kept in view. Instead of having a number of little separate museums for pathology, surgery, medicine, gynecology, medical jurisprudence and drugs, these should form one general museum, into which the students could go at any time and study the specimens in the cases, the specimens all labelled to facilitate objective study. There is, of course, some inconvenience in carrying the specimens to and from the lecture-rooms, but that is a minor consideration. The study of specimens on the shelves is the main object of a museum. Such a museum is itself a school, and of more value to the student than lectures. Each professor, if he liked, could have the key of the cases containing the specimens belonging specially to his department, and there should be a curator or skilled attendant, who would always be present and working for the whole museum. Such a museum-room could be well provided for in broadening the north wing, and the inconvenience of carrying specimens to the lecture-rooms would be minimised by these lecture-rooms being, as suggested, placed in that wing.

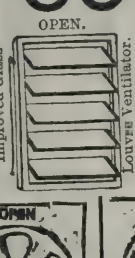
Then, as to the size of the lecture-rooms. It was stated lately, in an account of the new rooms in the south wing, that one of the lecture-rooms is seated for 240, another for 250. I have seen a plan for a surgery lecture-room on a light scale. Is that necessary or right in a school entering about 100 new students a year? When will Aberdeen come to learn that the hospitals and dispensaries are the laboratories for medicine and surgery, and that the place to learn midwifery is at the bed-post? And, along with these, private study. The "spoon meat" of the college lecture-rooms with which we feed our medical babes is for the most part only talk about medicine, surgery and midwifery, not the thing itself. This is not the question of the expected reduction under the new ordinances of the number of lectures in each course, which still go on in addition to the new and really useful practical courses. It is a question of reattendance on the same course of lectures. The day is past for that, but great big lecture-rooms are a temptation to it and provision for it. Go the round of the medical schools, and you will find the anatomy lecture-room bigger than the other lecture-rooms, the custom having been to go twice—in the old days even thrice—to the same course of lectures. But anatomy lectures are not lectures, but demonstrations. When I planned, under the old custom, and in consideration of the subject, the new anatomy lecture-room seventeen years ago, it was seated for 180, not 250. But I would not plan it so large now. Students ought not to attend twice the same course of lectures, not even in anatomy. The University Court ought not to allow it. In anatomy there ought, in my opinion, to be a junior and a senior course, each on three days a week; and if there is to be any second attendance on lectures on any other subject, the Court ought to require the Professor to give the two courses at different hours, or on alternate days. If any class is within two faculties, and the number very large, the Professor should be required to lecture to each separately, as the value of demonstrative or experimental lectures is greatly diminished if the class is very large. The day, therefore, for providing monster lecture-rooms in a University for science or medical teaching is past. The University Court and those who are to give the money should see to that. The present medical

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HEALTH EXHIBITION.



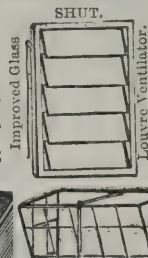
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H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.



GLASS SELLERS' COMPANY EXHIBITION,



MEDAL AWARDED, 1876.

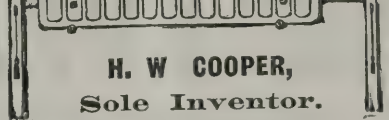


Improved Casement.



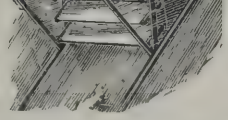


Circular Glass Revolving Ventilator.

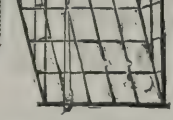


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lecture-rooms at Marischal College are already large enough for all who ought to be there in a school entering about 100 new students a year, according to modern views of medical education. The school may increase. That is not improbable to some extent for a few years, from the name it has got. But the fact is, however unwelcome the thought, that we have already more than we can teach practically, especially clinically, and when that is found out, and when the movement for medical graduation in London on the Scotch footing is completed, and when, by-and-by, Forfarshire is taken from us by the new school of Dundee, we may rather expect some diminution, and that will be no discredit to the Aberdeen school. I have always said our medical school will be safe as long as it had 300 students, and that will always be a creditable number for Aberdeen to have, with its limited hospital power. Even in view of any possible increase, no new medical lecture-room here ought to be planned to hold more than from 130 to 150. Look at the celebrated new buildings for science and medicine of the German Universities. The Scotch eye is at once struck with the small size of the lecture-rooms and the large size of the laboratories.

As to the locality of the new science buildings, I venture to ask for a moment the suspension of some Aberdeen prejudices. It cannot be at Marischal College, without at great cost for the purchase of surrounding properties, and without in the end being cramped for space and surrounded by slums. It is no use shutting our eyes to all that. Delays and delays till young professors have grown grey, unsatisfactory results in the end and melancholy surroundings. But there is plenty of ground at King's College without a sixpence to pay for it. A series of handsome science buildings, contiguous or continuous, a second and larger quadrangle it might be, could be erected there for chemistry, physics, geology, botany and zoology, archæology too, if you like; laboratories and lecture-room below, a suite of continuous museums above; all according to modern ideas, plenty of space and air and pleasant surroundings; all at less cost than anything approaching to it is possible at Marischal College; a complete school of the natural sciences, physical and biological, of which Aberdeen would have reason to be proud as the best in Scotland. Professors and statesmen in Germany would at once decide for that, glad to have such a site, and one would expect that professors anywhere who are in love with their work would jump at such a prospect as the happiest life they could lead, every modern provision for teaching and research, good museums, happy surroundings, and if they liked, their houses and gardens close by. If any of the good folk of the town are opposed to this proposal, send them as a deputation to Germany, say to Bonn and Leipzig, and they will come back wiser and converted men. Marischal College, as it now is, would then provide all that the medical school proper requires. Pathology would move into the natural history rooms, and the museum-room would be the general museum of the medical school, already indicated; and there would be some rooms to spare for other purposes. It would still remain for the town when it liked to make the street improvement by removing the old houses of Broad Street, and for the old church to be dealt with as might be desired.

But if Aberdeen is hopelessly joined to its old idols, the question is, where can the new buildings at Marischal College be placed? The "opening up" of Marischal College by removal of the old Broad Street houses is to be regarded as a city improvement, to be done by the Town Council. That will take from 15,000*l.* to 20,000*l.* The College is not going to spend its money on letting the public have a view of it. The entrance is shabby, but many good men have gone in and out at that venerable gate, and may still do so till the Town Council is pleased to make the clearance. Nor is the ground on which the old church stands necessary to the College. Let those who looked to getting a good church bargain out of the necessities of the University abandon that hope. The church may stand. When the Broad Street houses are cleared, the frontage and south end of the church will be not amiss to look at. Seen from the college it is certainly ugly—hideous, indeed. It looks best at midnight, when I have often seen it, with perhaps a touch of moonlight, which

> Leaveth that beautiful which still is so,
> And maketh that which is not.

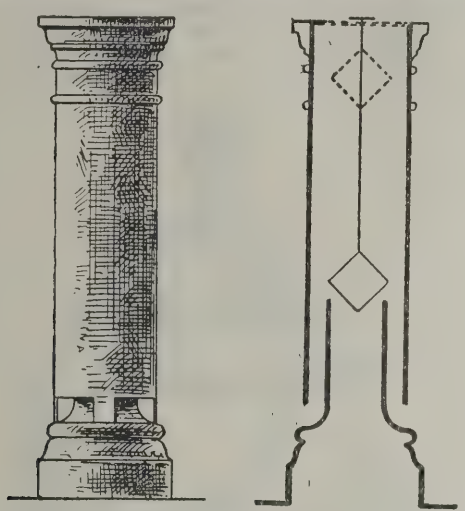
Perhaps Byron, who lived close by, got his inspiration for that from it before he saw Rome. We hear of the idea of "restoring" the old edifice to the tune of some 3,000*l.* If so, the subscribers for University extension will no doubt see to it that their money does not go that way. From recent church extensions in and about the city, still going on, it would appear that the Established Church is in good funds. The best way to deal with the old church is to photograph it, and remove it, bag and baggage. It is not needed for a graduation hall—we have that; and as to converting it into an antiquarian museum, however appropriate in idea, it would be ill-fitted for such a purpose, and the ugly edifice would still be there unless at great cost for

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external adornment. It seems never to have occurred to the few persons who are shocked at the idea of the old church disappearing, that a contemplated removal of the old Broad Street House Byron lived in would be a worse piece of vandalism.

NOTES ON NOVELTIES.

Chimney-cowls.—We have had lately brought to our notice a chimney-cowl manufactured by the Climax Ventilating Company, of 15 Great George Street, Westminster, of which we now illustrate the plainest design, and it will be seen that even this has a good appearance, while an octagon design which they make has a decidedly architectural treatment. It will be seen



from the section that the apparatus is extremely simple and is not liable to get out of order. It is free from all noise, is easily cleaned, and its efficiency is most highly spoken of, as from whatever direction the wind blows it is deflected vertically across the space between the extremity of the cone and top of the inner pipe in connection with the flue, creating a powerful upward current without the possibility of a blow-down.

LUGWARDINE WORKS, WITHINGTON.

A VISIT has just been paid to the works of Messrs. William Godwin & Son, ecclesiastical and art tile manufacturers, by H.R.H. the Princess Mary Adelaide, Duchess of Teck, H.R.H. the Princess Victoria Mary of Teck and H.S.H. the Duke of Teck.

Intimation of the visit was received about noon on the day, and preparations were at once made for the reception of the Royal party. They arrived at the works about a quarter to four, and were received by the proprietor, Mr. Godwin, and the manager, Mr. Pickerill, the drum and fife band of the works playing the National Anthem.

The Royal visitors were accompanied by Mr. Michael Biddulph, M.P., Lady Elizabeth Biddulph and a distinguished party, numbering in all fourteen, who were paying a visit to the Lady Emily Foley. The party were conveyed in her ladyship's carriage, and a drag drawn by four splendid horses, driven by the owner, Mr. Booker. The Duke and Duchess and party were conducted by Mr. Godwin and the manager over the works, and the different processes of the manufacture of encaustic and other tiles were fully shown and explained, the Royal visitors appearing to be much interested and pleased with what they saw. The manufacture of the inlaid or encaustic tiles was watched closely, and was a source of much interest—so much so that the Duke, Duchess and the Princess Mary inscribed their names on the backs of some of the tiles they had watched being made, and these will in due course be forwarded to their Highnesses. Messrs. Godwin & Son's art tile chimney-pieces, with tile interiors, were also much admired, several sets eliciting much praise. The Royal party also manifested much interest in the copies of the Early English ecclesiastical tiles, the Duke especially desiring to take with him some specimens similar to those he had seen in the Priory, Malvern. The Duchess and the Princess Mary also desired some of the tiles which they had seen and admired to take away with them as souvenirs of their visit—a request which was most readily granted.

On the completion of the visit, which lasted nearly two hours, the Royal party signed their names in the visitors' book, and expressed to Mr. Godwin the pleasure the visit had given them. Graciously shaking hands with Mr. Godwin, also with Mr. Pickerill, they left for Stoke Edith amid the cheers of the workpeople.

MOVABLE TABLE TELEPHONE.



Patent No. 5,008, 1890.

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The drum and fife band of the works played a selection of music during the visit, the Duke personally thanking the players.

IMPROVED TELEPHONES.

Messrs. Grist & Turner, of 53 Gracechurch Street, E.C., and 61 Piccadilly, Manchester, have recently introduced several important improvements in connection with the simplifying of telephonic communication. We shall call attention to two of the specialties of this firm. The first is the "Sphinx" telephone, which is claimed to be 50 per cent. cheaper than any manufactured instrument in the market. It conveys the sound as clearly as any telephone in existence, and a test of forty miles distinct—which took place satisfactorily in our presence—must obviously stamp the "Sphinx" telephone as adequate for all commercial purposes. The convenience of an improvement which dispenses with the trouble of the central station system to large firms having a number of clients to communicate with can hardly be overestimated. This system is known as the "intercommunication system," distinguishing it from the central office system. It admits of speaking direct without the circumlocution usually necessary in calling up a central exchange—an advantage which must have a great influence on the promptness of business relations. It may be pointed out, too, that an enterprising firm might originate a telephonic centre from its own works to its customers—continually by that means increasing their number—or branches in one town might thus be connected with the head offices at a considerable reduction in the expense of individual connection with an exchange system. A case in point is the Co-operative Society of Manchester, a firm with upwards of sixty branches in the locality, who have adopted this direct system. Messrs. Grist & Turner have carried out the work most successfully, a result which has induced many other firms about Manchester to do likewise. We may mention amongst others Barlow & Jones, Limited, Bolton; Thos. Taylor & Sons, Limited, Bolton; Simpson & Godlee, Manchester; Hulme Bros., Manchester; W. E. Buckley & Co., Limited, Bury; &c.

We should mention that although Messrs. Grist & Turner claim to do the cheapest work in the market, they insist particularly on its quality and the excellence of the materials used. Every telephone is made under personal supervision and the materials are carefully selected. Fowler-Waring cables, for instance, are used by the firm in all their installations, the name of which is a guarantee of excellence. Amongst users of Messrs. Grist & Turner's "Sphinx" telephones, for domestic purposes, may be mentioned the following:—The Right Hon. Earl Beauchamp, Sir R. Harvey, Colonel S. B. Bevington and Sir Henry Meux. It is only natural that, with this evidence of success, Messrs. Grist & Turner should lay claim to one of the best and cheapest telephones produced, which will get more widely used as its merits are known.

Messrs. Grist & Turner have also turned their attention to the necessity of a combination moveable telephone, and the result is an invention which has not yet made its way into the market, but of which we are enabled to give a few details. We think we are justified in asserting that nothing of the same kind has ever been accomplished previously. It consists of the combination of bell, telephone and switchboard in one. The illustration accompanying shows the compactness and ornamental character of the patent, no less than its handiness and utility



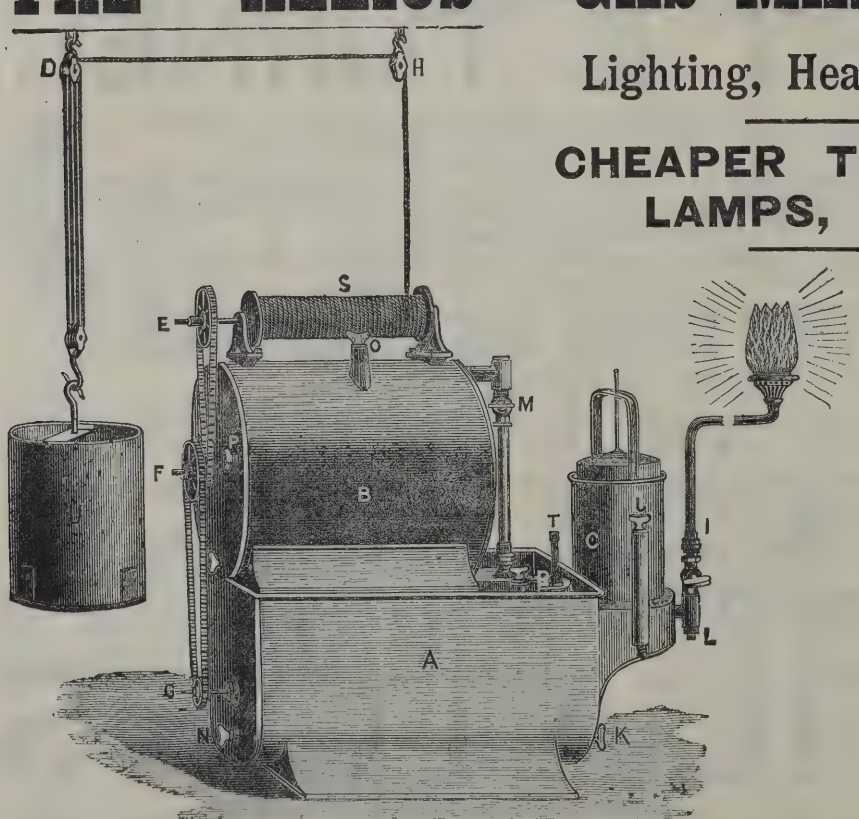
Its use in clubs, flats, offices, seems only a matter of being known, and we anticipate that such a useful little contrivance, through which can be heard the faintest whisper, will for short distances supersede larger telephones. It lies on the desk, and is quite

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complete in itself, whilst the tedious bawling and ringing is quite dispensed with.

We would call the attention of architects to the two inventions alluded to, which will relieve them of many of the difficulties attending the efficiency of telephones and will give satisfaction to their clients. We may add that Messrs. Grist & Turner have a department for electric light, and several installations in hand.

TECHNICAL SCHOOL, LIVERPOOL.

A BUILDING specially constructed and furnished for providing technical instruction to evening students has been opened at 21 Islington Flags, a few doors above the Walker Art Gallery. From front to back the length is 121 feet, and 21 feet wide. There are four storeys in height to Islington, and two storeys high at the back, fronting to Islington Place. The front is of Classic design, and the entrance is by a fine glass-fronted door direct from the pavement. In the vestibule are two doors, one leading into the secretary's offices, and the other into a long corridor, from which are the entrances to the physics department and electrical laboratory, the engineering department and the staircase leading to the drawing and brickwork and masonry department. The electrical laboratory is 67 feet by 18 feet, having a concrete floor and roof light, and being fitted with working benches, masonry piers for galvanometer, &c., accommodation being provided for about thirty students doing practical work. The work in this department is designed to meet the requirements of electrical engineers and others who desire an acquaintance with practical electrical testing, a large quantity of general electrical apparatus and various testing instruments being provided. The course of instruction consists of a lecture of an hour's duration in the adjoining lecture-room, after which the students proceed to the laboratory and devote the rest of the evening to practical work there, the nature of which will, as far as possible, bear upon the subject matter of the lecture.

The physics lecture-room adjoins the laboratory, provision being made for a full experimental treatment of these subjects. Owing to the liberality of Mr. Henry Tate, who has generously added to his previous aids to the cause of education both in Liverpool and in London, the committee will now be enabled to complete the electrical laboratory by putting down electrical light installation for experimental work, which will very materially add to the educational value of the institution.

The engineering classes embrace the following subjects:—Practical plane and solid geometry, machine construction and drawing, applied mechanics and steam. These will be held in the main lecture-room on the ground floor and in the lecture-room immediately above. The lower room is 51 feet long and 19 feet wide. It is fitted up with a view to the experimental treatment of the subjects, and the large amount of general apparatus which is available, together with the testing machine presented to the school by the late Sir C. W. Siemens, F.R.S., and a screw-cutting lathe for the preparation of specimens, &c., will enable the instruction to be carried on in a very practical manner. In the lecture-room devoted to brickwork and masonry at the rear, which is 38 feet by 19 feet, there is provided benches specially made, tools and materials for modelling. The different constructions for masonry will be modelled, and special attention will also be paid to brickwork.

The carpentry-room fronts to Islington (31 feet by 21 feet). Benches, tools and a large stock of timber are provided for these, the oldest technological classes in the city. Living specimens of the most common timber trees will also be provided in due course. The student will thus be enabled to work instructive examples in wood for himself at the bench, and to learn thoroughly the nature and properties of the timber with which he has to deal. The instruction will be purely technical, properly so called, and carpenters and joiners only are invited to attend. The course, commencing with simple joints, will include hand-railing and work of double curvature generally, so that apprentices and journeymen alike will be provided for.

In the modelling-room separate tables and stands are provided for each pupil, together with examples for art students in figures, busts, and natural conventional foliage. Special arrangements are made to meet the requirements of amateurs, who have only to provide simple tools at the cost of 2*s.* or 3*s.*

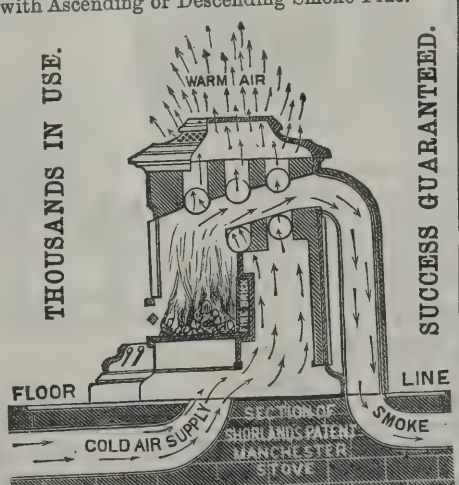
The department devoted to typography and to lithography will be held in the same room, 31 feet by 21 feet. The work here will be purely technical and devoted to the members of the letterpress and lithographic trades only, most of the lessons being fully illustrated by work executed before the students.

The plumbers' workshop in the basement is 28 feet by 20 feet, and approached from the main stair, centrally situated in the building. It is so situated that the noise associated with the manual practice of a score or more of plumbers simultaneously may not interfere with the more sedate studies in other parts. It has been carefully fitted with all the usual and most modern appliances of a well-equipped workshop, and from what has

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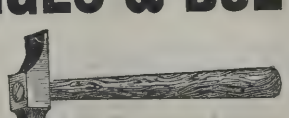
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already been done it may be judged that the session will bring forth some excellent workmanship.

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The want of a practical plumbing class seems to be keenly felt, and students who have from time to time inquired for this should send their names early to the secretary so that no time may be lost in preliminaries. The theoretical class will be continued, as previously, at the Free Library on Tuesday evenings. Other work will be carried on, such as photography, art drawing, shorthand, mathematics, &c.

There are suitable sanitary conveniences. The lighting and ventilating are executed by the well-known firm of Sugg & Co. The heating throughout is by means of hot-water pipes. The general contractors for the alterations and improvements were Messrs. J. Henshaw & Sons, of Chatham Street, who have carried out the work under the direction of the architect, Mr. J. Francis Doyle, Harrington Street.

The building sub-committee who have been instrumental in designing the arrangements consisted of Messrs. J. W. C. Haldane, Henry Duckworth, T. Gee and Dr. Gustaf Shack-Sommer, and they have acted under the advice of the various teachers.

THE EXCAVATIONS AT SILCHESTER.

THE following account of the systematic excavation of the Roman city at Silchester, begun last year under the auspices of the Society of Antiquaries, which has been steadily and quietly carried on for the past four months, has been given by Mr. W. H. St. John Hope :—

In continuation of our system of working out the site by the squares into which it was divided by the Romans, the work this year has been confined to the two squares, or *insulæ*, immediately to the west of the great basilica—that is, in the centre of the city ; and also to the completion, since harvest, of the large *insula* north of the forum which was undertaken last year. The northern of the two new *insulæ*, the cost of excavating which has been undertaken by Dr. Edwin Freshfield, treasurer of the Society of Antiquaries, has yielded very interesting results. The centre of it seems to have been chiefly open ground or gardens, with buildings ranged round the four street sides. These include the more or less perfect remains of a number of shops and houses, the latter having rooms warmed by channelled hypocausts and floored with mosaic pavements. One very perfect set of shops has been uncovered, attached to a small but complete house, with winter room warmed by a curious composite hypocaust, and a principal room with mosaic floor of unusual pattern. A model to scale of this interesting group is in course of construction.

The rubbish pits scattered over the *insula*, like those found last year, have yielded a great many interesting and curious objects. Chief among these are the fictile vessels, of which a considerable number of more or less perfect specimens have been unearthed, representing all the principal kinds of Romano-British pottery, as well as the imported pseudo-Arretine. Of minor articles in bronze (including a beautiful little enamelled stand), bone and glass, many interesting examples have come to light, together with numerous coins, though mostly in indifferent preservation. The pits have also yielded great quantities of animal bones, which are now under examination by experts. Among them is the almost complete skeleton of a Romano-British dog.

The architectural fragments do not include any of great importance, but a base of a column of good design and workmanship may be noticed. A small and perfect mosaic pavement in one of the houses has been successfully taken up for preservation. The southern of the two new *insulæ* has been excavated at the cost of the late Mr. Walter Foster, whose premature death in July last is a sad loss to his fellow-workers at Silchester. This *insula* has also yielded many interesting remains from its very numerous rubbish pits, including pots and vessels of all kinds, a quantity of fruit-stones and fish-bones, a set of bronze bucket-handles, a bronze bowl or saucepan, fibulæ, pins and other objects. From the trenches have also been unearthed various antiquities, part of an inscription on a Purbeck marble slab, coins and a number of interesting architectural fragments. Like its fellow this *insula* contained a good deal of open ground, but among other buildings, &c., uncovered is the complete ground plan of a house, a large series of chambers of uncertain use, a remarkable pavement of hard white *opus*

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signinum and the remains of other houses and hypocausts. The tesselated floors in this *insula* are, unfortunately, but ill-preserved. Close to the house mentioned above a well lined with wood has just been discovered and is now being cleared out.

The excavation of the uncompleted insula north of the forum has only been begun since harvest, and the work is still in progress. Already the enclosure of probably a small shrine or altar has been uncovered, and a series of chambers along the main street. Some interesting remains have also come to light, including a perfect bronze figure of a goat, of good workmanship, and a considerable fragment of some rare foreign marble, used probably as a wall lining. Another, but lesser, piece of the same kind of marble was found earlier in the year in a different part of the excavations.

On the whole, the results of the season's work have so far been satisfactory, the find of pottery and earthenware vessels being very encouraging. A valuable addition, too, has been made to our knowledge of Romano-British building, showing the differences that exist between the town houses of Silchester and the country houses or villas. Both again differ in a remarkable way from the typical Roman house as seen in Italy—a fact that cannot be too often insisted on.

Amidst the mounds and heaps of displaced soil it is difficult for a casual visitor to Silchester to form any definite ideas of the plans and arrangements of the different foundations uncovered, and it is as well that those who desire to see the works still in progress should bear this in mind, and so avoid disappointment. In all probability, too, all the plans, drawings and models, and the whole of the antiquities found, will be exhibited at the rooms of the Society of Antiquaries at Burlington House during the winter, when those who are interested will have every opportunity of seeing them. A similar exhibition in January last of the result of the previous year's excavations was most successful.

Through the kindness of the Duke of Wellington, all the antiquities found at Silchester will be deposited in the Reading Museum, where the objects found last year have already been placed. An excellent nucleus of what will in time be a most important Romano-British collection has thus been formed.

If the excavations are to be carried on, as proposed, year after year, till the whole of the hundred acres within the city walls has been examined, funds must, of course, be forthcoming, and the treasurer of the Excavation Fund, Mr. F. G. Hilton Price (1 Fleet Street, E.C.), or myself, will gladly receive and acknowledge subscriptions. So important, not to say national, a work must not be allowed to flag, and it must surely be possible to find imitations of the excellent example of Dr. Freshfield and Mr. Foster in defraying each the cost of excavating an *insula*. It is also clearly the bounden duty of the Reading people, whose museum will so largely benefit by the excavations, to come forward in the same laudable manner.

Since our (at present) scanty knowledge of the civil life during the Romano-British period can only be increased by the judicious use of pick and shovel, it behoves everyone who is interested in the early history of this country to assist in the excavation of the Romano-British city at Silchester.

SILICIOUS PAINTING.

Dr. Fuchs, of Munich, discovered a method of painting which he called stereochromy. The want of a vehicle more enduring than those formerly in use and less liable to injure the colours employed, led to this discovery. Dr. Fuchs's method consists in the use of soluble silicates as the fixing material, and has been applied with considerable success on the Continent by German artists of distinction, and in this country by Mr. Herbert in the Houses of Parliament and by others.

The adoption of decorative and monumental painting for the embellishment of public and private buildings has rendered necessary some changes in the older processes of painting, because the requirements are different. Wall-paintings are more exposed to destructive influences than paintings on panel or canvas: the wall itself is more absorbent; the accumulation of dirt, which has from time to time to be removed, the impossibility of giving the same care to their preservation as to those of smaller size which are movable, render the employment of a different method of painting necessary and one which will leave the picture in such a state that it may, so to speak, take care of itself, and be independent of any further attention than that which is required to keep it clean, and for the cleaning process its surface must be such that it cannot be readily injured.

Oil-painting is unsuited for wall pictures on account of the glossy surface which it leaves, and for other reasons into which it is not necessary to enter here. All the expedients which have been tried to get rid of this defect have failed, because they have interfered with the permanency of the work.

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Fresco-painting is open to many objections. In a damp climate it is not enduring. It is well known that the face of a plaster wall is destroyed by damp; and a fresco painting is nothing more than a plastered wall with a coloured surface, rendered more perishable by the colours, which, to some extent, interfere with the coherence of the particles of lime and sand forming that surface. The painting is executed while the wall is wet; water and lime only are used with the colours; their adhesion, therefore, is effected by the same power which binds together the other constituents of the wall, viz. the union between the lime and sand; and inasmuch as most of the colours form no compound with lime or sand, they must tend to weaken by their presence the cohesion between these substances by interfering with their perfect contact. The manipulation in fresco-painting is difficult, requiring great care and skilled labour of a particular kind, only to be acquired by long practice and considerable observation, and is, therefore, unfit to be entrusted to workmen of the kind usually employed in decorative work. From the slowness of the process, it becomes very expensive, and this alone would prevent its general use, even if it were in other respects satisfactory.

Silicious painting seems to supply all that is wanted for beauty and stability. It makes the surface of the wall almost impervious to moisture, it fixes the colours firmly to the ground, it leaves no gloss, and, as will be seen, is easy of application. But the process discovered by Dr. Fuchs seems incomplete and open to some grave objections, although the principle on which it rests is sound.

Silica is soluble when fused or boiled under pressure with excess of caustic alkali. The compound thus obtained is a viscid, sticky liquid, of syrupy consistency; for many purposes it is a better adhesive material than gum, and its effect as a fixing medium is to bind colours very firmly to certain surfaces; it binds them, however, as a gum, though in some instances it fixes them by a chemical action; but this cannot be depended upon as securing the stability of a painting, as it only happens where the colours used form chemical compounds with the silicate, and this is the exception. When a soluble silicate is applied to a surface containing a substance with which it readily unites, a portion of the silica in solution will combine with it; and in proportion as the silica is precipitated the alkali which held it in solution will be set free, and therefore the remaining silicate will become more alkaline and more soluble. This is proved by exposing a piece of stone, such as Caen stone, coated with silica, to the action of the atmosphere; the silicate, which at first dried with a glossy surface, gradually dissolves, being acted upon by the moisture of the air, and that which had penetrated to a slight depth into the stone behaves in the same manner and loosens the particles on its surface.

This seems to form a serious objection to the use of soluble silicates, either for stone preservation or stereochromic painting; and it is a difficulty which those who have worked upon soluble silicates have found very troublesome to remedy. The fact that silica combines with lime, sand and other substances used in the painting ground, is indisputable; but this very combination leaves behind that which in the presence of moisture has a destructive action on the ground which it is intended to preserve and on the colours applied to it. In painting a picture, especially one of large dimensions and in ornamental painting, the colours are often laid on in thick masses; but if these colours do not combine chemically with silica they will be only mechanically fixed to the wall by the silicate; and as this silicate, which was soluble before application, remains so afterwards, unless it form an insoluble compound with some other substance, the simple action of damp continued for some time will loosen and eventually remove the colours. Now, many of the pigments used in painting, such as ochres, umbers, certain reds and blacks, do not combine with silica; and as they are frequently used pure or nearly so in the glazing and finishing touches, on which the effect of a picture mainly depends, they cannot be permanently fixed, and such is proved to be the case by the experience of those who have given the subject patient and careful investigation. There are, doubtless, many silicious paintings which have stood for several years; there are also distemper paintings which have lasted for many more. In sheltered situations and in interiors it is quite possible that this may be the case; but even here repeated applications of silicious washes have been made at intervals, after the completion of the work, and such a practice is recommended for refixing particles of colour which may, after a time, have become loosened.

The above remarks are not intended to disparage Dr. Fuchs's discovery, which is, in truth, one of the most important to art ever made. To this modest and great man all who are interested in the advancement of art owe a deep debt of gratitude for his persevering labours, pursued for many years amidst much discouragement and many difficulties. Those who read his treatise on stereochromy cannot but feel delighted with the earnestness and singleness of purpose with which he has laboured to attain the high end which he set before him.

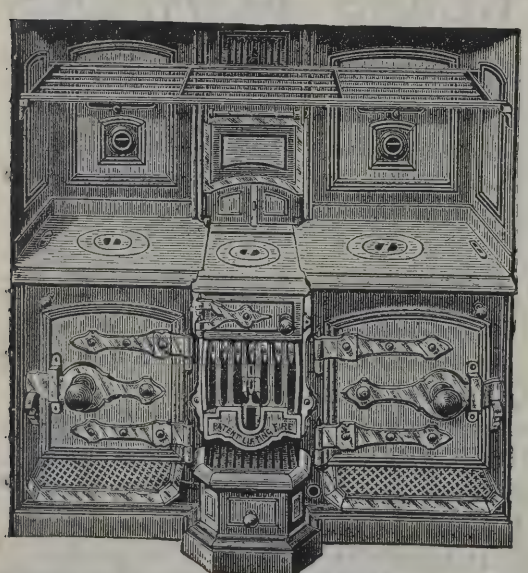
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He thus concludes the account of his investigations :—"But, before all, I thank God, who graciously allowed his weak and aged servant to finish the preceding investigations so far that others may build upon the foundation that I have laid." He evidently saw that much remained to be done to perfect the process which he had originated.

This paper has been written to lay before those who feel interested in the matter certain facts which are the result of some years' experience, and also to induce those who are engaged in art pursuits to turn their attention seriously to a process which, by rendering their works lasting and in all respects better suited to supply an increasing want, will make their profession more remunerative and their exertions more conducive to the happiness and improvement of their fellow-men.

If artificial ultramarine be mixed with a soluble silicate—for example, silicate of potash—and be laid on a properly prepared ground, it will become so firmly fixed that no amount of washing nor the slow action of moisture will remove it or affect its brilliancy. If, however, reds, such as vermilion, red ochre, some of the oxides of iron, or browns, such as umber or siena, be similarly treated, they will not endure the same test. Why is this? Ultramarine contains 37 per cent. of silica and 27 per cent. of alumina—two substances with which a soluble silicate readily unites. It is well known in laboratories that test tubes and other glass vessels which have contained soluble silicates become corroded, and that it is impossible to separate the silicious crust from the glass. There is in all soluble silicates, unless specially prepared, an excess of alkali; this, no doubt, acts on the glass vessel, and, by partly dissolving it, facilitates the union of the silica deposited from the solution with the softened particles of its surface. In time the alkali becomes saturated with the silica of the glass vessel, and when this saturated silicate is dry it is much less soluble that when excess of alkali was present. Alumina readily unites with silica in the soluble form, whether the alumina be in solution or not, though in the latter case the action is much slower. It also takes into combination with it a certain quantity of the alkali, forming a compound analogous to felspar. It is not, therefore, difficult to account for the stability of the product resulting from the mixture of ultramarine with a soluble silicate. This fact points out the direction in which investigations should be made for the improvement of silicious painting. It will be well to consider briefly, first, the method of preparing colour; then the preparation of the painting ground; afterwards the solution to be used as the painting vehicle; and, finally, the method of manipulation and the permanent fixing of the picture. Alumina forms very stable natural compounds with silicate, potash, soda and lime. Felspar, which enters largely into the composition of granite, consists mainly of silica, alumina and potash. Porphyry, red and green, is a very enduring substance, and is also a species of felspar. Basalt, labradorite and albite are formed of silica, lime, potash and alumina variously combined. Labradorite contains lime and albite soda in union with silica and alumina. All these minerals are hard and enduring. It is quite possible to produce artificially substances approaching their composition which will resist the action of damp and other destructive agents to which paintings are always exposed. Judging from the behaviour of ultramarine, if the colours employed contain silica and alumina, they should adhere as firmly to the surface on which they are placed; and such really is the case. If alumina be fused with potash, aluminate of potash is formed containing a large quantity of alumina. If this be dissolved, so as to form a solution of sp. gr. 1·12, it may be kept for several days; if a stronger solution be made, it begins very soon to deposit alumina. The solution sp. gr. 1·12 mixed with silicate of potash sp. gr. 1·2 will remain liquid for twenty-four hours, or perhaps a little longer; after that it will gelatinise slowly. If while in the liquid state colours are saturated with this solution, and are allowed to dry, their particles will be very intimately mixed with silica and alumina chemically combined with potash. After drying for some time at a gentle heat the operation may be repeated, and any quantity of the silicate of alumina and potash may be thus mixed with the colours. Care should be taken that they be finely powdered between each application, and they should be stirred up so as to keep them from caking at the bottom of the vessel, which hinders the perfect contact of the particles with the liquid. After careful drying for some days they may be well washed for the removal of any uncombined potash. The admixture of silica and alumina does not interfere with the brilliancy or depth of the colours. This method may be used for all colours, but it is better suited for such as ochres, umbers, siennas, &c., which are changed in tint by exposure to a high temperature. The different pigments made from metallic oxides, such as iron reds, cobalt blue, chromic green, &c., are better prepared by precipitation, as silicates and aluminates, by the addition of the mixed silicate and aluminate of potash to any of the solutions of their oxides in mineral acids. The precipitate should be

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well washed, dried, ignited and ground. Colours made by the same method as those used in painting on porcelain (*i.e.* by fusion), where the colour is not affected by intense heat, answer perfectly well, as they contain silica to which alumina can be added in the process of manufacture. Excellent reds, greens, browns and some yellows can be procured in this way. The object of using colours which contain silica and alumina has already been stated to be the formation of coherent insoluble compounds with the vehicle used in painting.

REGISTRATION OF PLUMBERS.

AT the meeting of the quarterly court of the Plumbers' Company, at the Guildhall, on the 29th ult., Mr. W. H. Bishop, re-elected master, Mr. Charles Hudson, re-elected warden, and Sir Philip Magnus, elected renter warden, were severally sworn into their respective offices for the ensuing year. Reports were made to the court with reference to the prizes and certificates of merit awarded by the company to the successful students in the plumbing classes held in the chief cities and towns of Great Britain and Ireland, and with reference to the examinations of candidates for registration, and the examinations in the preliminary course of the company's graded syllabus of instruction for plumbers.

The district council for South Hants and the Isle of Wight held a meeting recently at the Municipal Offices, Southampton, when there was a good attendance. The registration committee acknowledged the receipt of the report of the board of examiners on the result of the last examinations held in Southampton. The committee reported that they had considered the draft Bill for the National Registration of Plumbers forwarded to them by the solicitors to the Worshipful Company of Plumbers, and that they had decided to request the Council to support the Bill.

At the last meeting of the district council for Glasgow and the West of Scotland, Mr. W. A. Rattray, plumber, afterwards Mr. David Thomson, architect, occupied the chair. The examiners submitted their report of the examination for applicants for registration, which was held in Messrs. Wallace & Connell's workshop on September 19. It was reported that bill, circular and prospectus had been issued in connection with the opening of the plumbers' class in the Technical College on the 7th inst., when the prizes for last session will be distributed in presence of the students, the governors of the college, and the district council. Further arrangements were made in connection with the resumption of the Greenock class.

AN ELECTRIC RAILWAY.

THE World's Fair Grounds at Chicago were to be opened to visitors on October 7, for the inspection of the work. For their accommodation there is being constructed an electric railway of ingenious and novel character, having a capacity to carry 30,000 passengers an hour with comfort and safety. This railway will differ from ordinary railways in that the passengers are transported on a movable sidewalk instead of box cars of the ordinary type. The sidewalk is to be constructed on an elevated structure 25 feet high and 900 feet long, in the form of an ellipse, and is to consist of seventy-five cars, each 12 feet long, connected together, making one solid train. There are to be constructed two parallel sidewalks, one running at the rate of two miles an hour, the other at four, both walks moving in the same direction. The passengers can step from the stationary walk to the one which moves at the rate of two miles an hour, and if it is desired to move at a greater speed, they can step from this walk to the one running at four miles per hour. The passengers can safely walk upon either of the movable sidewalks while in motion if desired. The structure will be illuminated at night by a number of incandescent lights, and as the grounds are to be illuminated with arc lights a satisfactory view thereof can be obtained during the evening as well as during the day. As the car-platform or sidewalk is arranged, it is perfectly level with the stationary walk, allowing the trolley wire to be placed beneath the surface of the platform, and the current taken therefrom by means of small trolleys attached beneath the car floors. The operation of this train of cars will be arranged in a novel manner, doing away with the use of motor-men, the entire train being controlled and operated by one man. There will be constructed at a central point, at one side of the track, a controlling station, where an attendant will have the train under perfect control. As an additional safeguard, push-buttons will be arranged at twelve points along the line of track, which will be connected with an electric bell and the circuit-breaker in the controlling-station, and, in case of accident to any of the mechanism of the

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IRON AND STEEL INDUSTRY IN INDIA.

At the last Indian Industrial Conference, held at Poona last month, a paper was read on the iron and steel industry of London by Dr. Dhanakoti Raju, of Madras and Mysore. Official records, he said, showed the total value of iron imported into India from foreign countries by private merchants alone, between 1868 and 1880, amounted to nearly 16 crores of rupees. The Government of India had, in a resolution of August 1882, said:—"It may be accepted as proved that India possesses the means of supplying all her wants in respect of cast-iron, wrought-iron and steel, and that such supply could be produced remuneratively on a strictly commercial basis." It had also been stated that India would ultimately become one of the largest sources whence Sheffield would draw her supplies of raw materials, and an eminent English manufacturer observed that, on the whole, the steel of India was the best he had met with. Dr. Dhanakoti hoped that the development of the iron ores of India might be left to private enterprise. Although the old native methods of manufacturing iron and steel were able to produce excellent results in former days, both with regard to the superior quality of the article turned out and the general profit of the business, they had now, within the last thirty or forty years, become quite unable to compete with the introduction of foreign iron and steel, the manufacturing cost of which had been greatly reduced by the introduction within the last fifty years of improved processes and appliances of machinery. The native system involved a ruinous waste of labour, time and materials compared with the modern European systems of manufacturing iron and steel. From the peculiarly favourable conditions and facilities that exist in some parts of India for manufacturing iron and steel of the finest quality in the world, it was not too much to say that if only some intelligent and enterprising men of moderate capital would earnestly and energetically work in the highly promising but greatly neglected field, it would soon lead to most important and lasting results. Dr. Dhanakoti spoke of moderate capital advisedly, for with such favourable conditions the undertaking was rendered comparatively simple and easy, and one which would involve very moderate expense. After a careful study of the question, he was convinced that, instead of adopting wholesale any of the modern European processes, it would be most advantageous to adopt the native system (with some modifications) of manufacturing iron and steel—the system which has been in existence in some parts of the country from the remotest antiquity, and which had produced the most admirable results till a very short time ago. That system was the simplest, the safest, and the best suited to the peculiar conditions of this country.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

Applications for Patents.

15984. Mary Anne Greene, for "Improvements in windows."

16005. George Pitt, for "An improved mode of constructing flues for brick, terra-cotta and other kilns."

16020. Joseph Trantom, for "Improvements in or relating to check-tills for use in shops and other places."

16105. Joseph Harper Kearton, for "An improved sash-fastener."

16154. Charles Henry Wilkinson, for "Improvements in window-blinds."

16200. Harold Ratcliffe, for "Improved decorative or ornamental wallings, ceilings and the like."

16201. Harold Ratcliffe, for "Improved fancy or ornamental bricks, tiles or slabs."

16275. Edmund Taylor and Harold Cliff, for "Door-stops or devices for holding doors open."

16309. Francis Weldon, for "An improved device for connecting the parts of scaffolding and other like structures."

16340. James Strick, for "A pad for use in connection with staples and similar holders."

To Inventors.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. Rayner & Cassell, Patent Agents, 37 Chancery Lane, London, W.C.

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Designs and Prices on Application.

JAMES EGAN
(Ten years with Morris & Co.),
DECORATOR & STAINED GLASS PAINTER.
Estimates and Designs for the Decoration of Public and Private Buildings submitted on application.
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HENRY KING
(Late GREEN & KING),
HOUSE PAINTER, UPHOLSTERER AND GENERAL CONTRACTOR,
Lower Seymour St., Portman Sq., W.
Late of 100 NEW BOND STREET).
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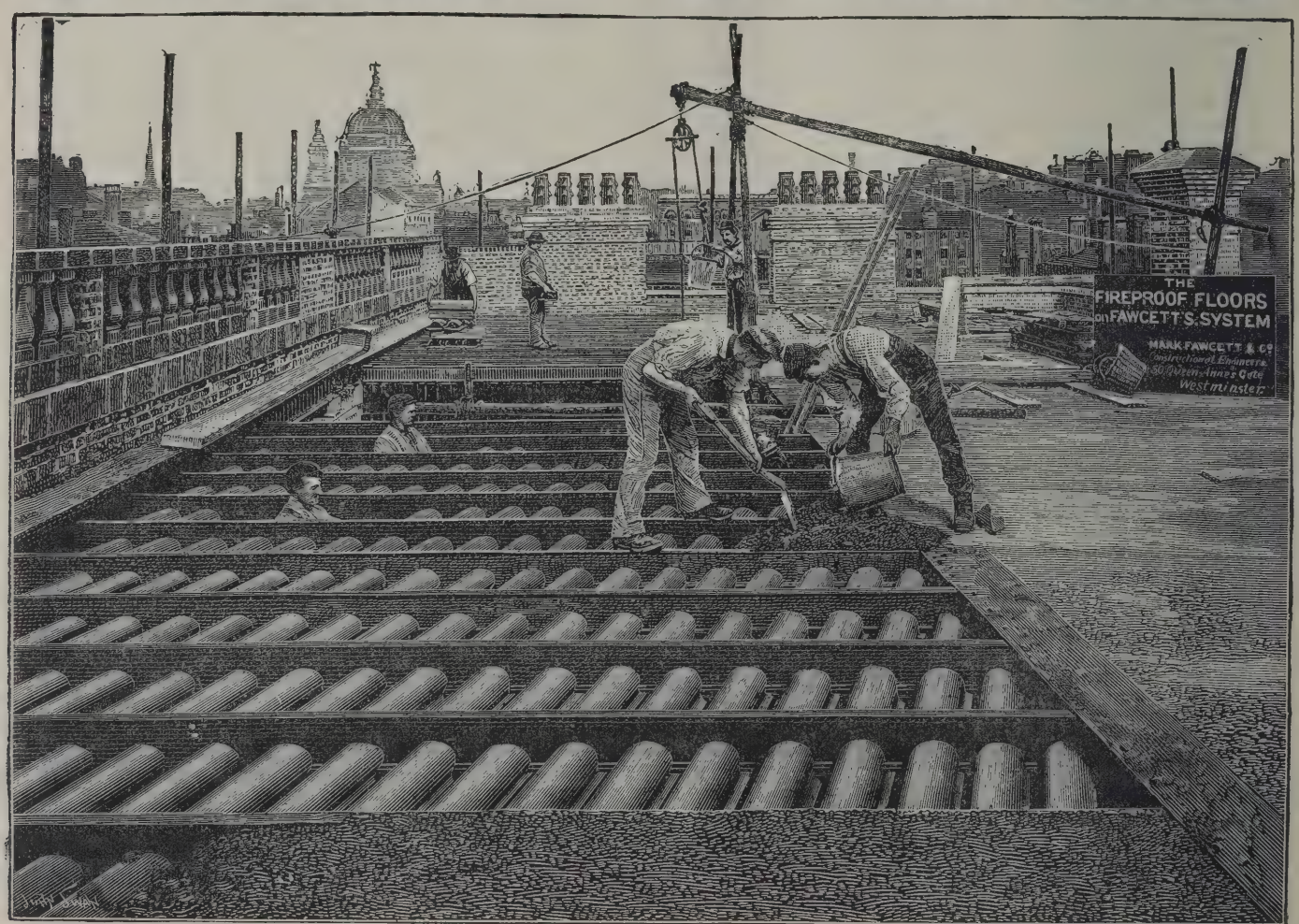
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Friday, October 9, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, OCTOBER 16, 1891.

TENDERS, ETC.

*** *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

BATH.—Oct. 31.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

BURTON-ON-TRENT.—Nov. 21.—Designs are invited for Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

FESTINIOG.—Oct. 31.—Plans and Estimates are invited for Electric Lighting. Mr. R. Walker Davies, Solicitor, Blaenau, Festiniog, North Wales.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

LICHFIELD.—Nov. 21.—Designs are invited for proposed Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

MERTHYR TYDFIL.—Nov. 12.—Plans are invited for School Buildings. Mr. E. Stephens, School Board Offices, Merthyr Tydfil.

CONTRACTS OPEN.

ALDERBURY.—Oct. 26.—For Building Lodge, Coachhouse, Stabling and other Works. Mr. Fred Bath, Architect, Crown Chambers, Salisbury.

BARNET.—Oct. 19.—For Supply of Broken Granite. Mr. H. W. Poole, Local Board Offices, Barnet.

BELFAST.—Oct. 17.—For Additions to Covered Market. The City Surveyor.

BERMONDSEY.—Oct. 19.—For Supply of York Paving and Aberdeen Pitchings. Mr. J. Harrison, Town Hall, Spa Road, Bermondsey, S.E.

BEVERLEY.—Oct. 16.—For Enlarging Grammar School. Messrs. Hawe & Foley, Architects, North Bar Street, Beverley.

BLACKPOOL.—Oct. 24.—For Extension of Open Market. Mr. J. Wolstenholme, Borough Engineer, Town Hall, Blackpool.

BRISTOL.—Oct. 16.—For Extension of Avonmouth Dock. Mr. John M. McCurrick, Docks Engineer, Cumberland Basin, Bristol.

BROMLEY.—Oct. 28.—For Alterations, Additions and Repairs to Vestry Hall. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

CARDIFF.—Oct. 17.—For Building Thirty Cottages and Construction of Road at Dinas Powis. Mr. W. H. Dashwood Caple, Architect, 1 St. John's Square, Cardiff.

CARDIFF.—Oct. 20.—For Extension of Boundary Wall and Railing, Howard Gardens. Mr. W. Harpur, Borough Engineer, Cardiff.

CARLISLE.—For Additions, &c., 3 Castle Street. Mr. T. Taylor-Scott, Architect, 14 Bank Street, Carlisle.

CATFORD.—Oct. 26.—For Building Ten Houses, Doggett Road. Messrs. F. & W. Stocker, Surveyors, 90 and 91 Queen Street, E.C.

CINDERFORD.—Nov. 7.—For Building Wesleyan Sunday School and Classrooms. Mr. John Wills, Architect, Derby.

CONGLETON.—Oct. 22.—For Boundary Wall, Entrance Gates and Retort-house Chimney at the Gasworks. Mr. Thomas Newbigging, C.E., 5 Norfolk Street, Manchester.

CONWAY.—Oct. 31.—For Levelling, Metalling and Making-up Roads. Mr. Wm. Menzies, Surbiton House, Englefield Green, near Egham.

CROYDON.—Oct. 20.—For Supply of Earthenware Drain Pipes. Borough Engineer, 8 Katharine Street, Croydon.

DOWNPATRICK.—Oct. 31.—For Constructing Waterworks. Mr. J. W. Montgomery, Union Offices, Downpatrick.

ELECTRIC LIGHTING.

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EASTBOURNE.—Oct. 19.—For Constructing Sewers. Borough Surveyor, Town Hall, Eastbourne.

EDMONTON.—Oct. 27.—For Building Porter's Lodge and Waiting-room. Mr. W. S. Cross, Architect, 18 Outer Temple, Strand, W.C.

GORSEINON.—Nov. 2.—For Building Board School. Mr. D. Isaac, 7 Rutland Street, Swansea.

GRENOSIDE.—Oct. 21.—For Building Board School. Mr. G. A. Wilson, Architect, Hartshead Chambers, Sheffield.

HALIFAX.—Oct. 16.—For Building Fire Brigade Station. Mr. James Farrar, Architect, Crossley's Buildings, Northgate, Halifax.

HALIFAX.—Oct. 29.—For First Portion of Scheme in Building Arcades and Shops to Old Market and Russell Street. Messrs. Leeming & Leeming, Architects, Victoria House, 117 Victoria Street, Westminster.

HAMMERSMITH.—Oct. 26.—For Building Four Houses. Messrs. F. & W. Stocker, Surveyors, 90 and 91 Queen Street, E.C.

HENDON.—Oct. 19.—For Kerbing, Channelling and Tarpaving. Mr. W. A. Tootell, Hendon Union Offices, Edgware.

HIGHGATE.—Oct. 21.—For Erecting Oak Fencing. Architect of the London County Council, Spring Gardens, S.W.

HOVE.—Oct. 26.—For Electric Lighting. Mr. Charles A. Woolley, Town Clerk, Town Hall, Hove.

KIDDERMINSTER.—Oct. 26.—For Boundary Wall and Wrought-iron Fencing and Gates at Workhouse Premises, Blakebrook. Mr. J. T. Meredith, Architect, Bank Buildings, Kidderminster.

LEEDS.—Oct. 22.—For Repairs to Buildings. Assistant Surveyor of Works, County Court, Leeds.

LEEDS.—Oct. 22.—For Building School of Medicine, Yorkshire College. Mr. W. H. Thorp, Architect, 61 Albion Street, Leeds.

LEWES.—Oct. 19.—For Building Public Offices and Alterations and Additions to Municipal Buildings. Mr. S. Denman, Architect, 26 Queen's Road, Brighton.

LONDON.—For Building Workshop, 60 feet by 30 feet, Two Storeys. Messrs. C. H. Glover & Co., Ormside Street, S.E.

LLANELLY.—Oct. 21.—For Additions to White Hart Hotel, Water Street. Mr. S. J. Parfrey, Proprietor.

LLANFAIRFECHAN.—Oct. 19.—For Sewerage Works, Gas Engines and Air Compressors, Engine-house, Shone's Ejectors and Stations and other Works. Messrs. Shone & Ault, Engineers, 16 Great George Street, Westminster, S.W.

MALVERN.—Nov. 2.—For Constructing Waterworks. Mr. John E. Palmer, Surveyor, Local Board Offices, Great Malvern.

MELTON.—Oct. 16.—For Works for Supply of Water to County Asylum. Mr. Geo. Hodson, Abbey Buildings, Prince's Street, Westminster, S.W.

MILLHOUSES.—Oct. 21.—For Building Branch Police Station, Constables' Dwellings, &c. Mr. C. F. Wike, Borough Engineer, Bower Spring, Sheffield.

MILNROW.—Oct. 21.—For Construction of Sewage Works. Mr. Henry Blackburn, Clerk to the Local Board, Milnrow.

NEWBATTLE.—Oct. 17.—For Building Board School, &c. Mr. J. W. Maclean, Architect, 30 St. Andrew Square, Edinburgh.

NEWTON-LE-WILLOWS.—Oct. 17.—For Building Public Hall and Offices. Mr. Thomas Beesley, Architect, Bold Street, Warrington.

OLDHAM.—Oct. 27.—For Building County Court and Offices. Assistant Surveyor, H.M. Office of Works, General Post Office, Manchester.

PETERBOROUGH.—Oct. 21.—For Building Dwelling-house. Mr. James Ruddle, Architect, Boroughbury, Peterborough.

PEEL.—Nov. 6.—For Building Court-house. Mr. H. Story, Government House, Douglas, Isle of Man.

PLYMOUTH.—Oct. 21.—For Building Soldiers' Quarters. Lieut.-Col. W. H. Rathbone, Royal Engineer Office, Devonport.

PRESTON.—Oct. 19.—For Building Shed, Albert Edward Dock. Mr. B. Sykes, Dock Engineer, 33 Winckley Square, Preston.

QUEENSBURY.—Oct. 17.—For Stabling, Cartshed and Conveniences at Crown Inn, Horton Bank Top. Mr. John Drake, Architect, Winterbank, Queensbury.

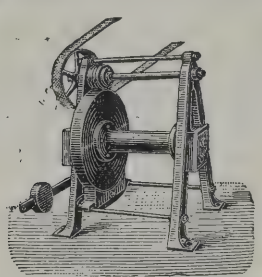
RAMSGATE.—Oct. 21.—For Constructing Sloping Road, Brick and Concrete Arches, Sea Wall and New Military Road. Mr. William A. Valon, Engineer, Hardres Street, Ramsgate.

RAWMARSH HILL.—Oct. 17.—For Building Five Houses and Altering Premises. Mr. J. Platts, Architect, Rawmarsh Hill.

READING.—Oct. 22.—For Building Board School for 1,132 Children. Mr. S. S. Stallwood, Architect, 27 and 28 Market Place, Reading.

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READING.—Oct. 19.—For Additions to Police Station. Mr. A. E. Collins, Borough Engineer.

SLAITHWAITE.—Oct. 26.—For Building Local Board Offices. The Clerk to the Local Board, Slaithwaite.

ST. HELENS.—Oct. 21.—For Erecting Electric-lighting Machinery and Appliances. Mr. Geo. J. C. Broom, Engineer, Town Hall, St. Helens.

SWANSEA.—Oct. 22.—For Additions, &c., to Osborne Hotel, Langland Bay. Mr. E. Bath, Architect, 58 Wind Street, Swansea.

TOTNES.—Oct. 29.—For Adapting Grammar School for Police Station. The Superintendent of Police, Totnes.

TREWALCHMAI.—Oct. 28.—For Building Police Station. Mr. J. Lloyd Griffith, Clerk of the Peace, Stanley House, Holyhead.

UPPER EDMONTON.—Oct. 27.—For Building Porter's Lodge and Waiting-Room at Union School. Mr. W. S. Cross, Architect, 18 Outer Temple, Strand, W.C.

WARRINGTON.—Oct. 17.—For Building Public Hall and Offices. Mr. Thomas Beesley, Architect, Bold Street, Warrington.

TENDERS.

ABERDEEN.

For Connection with the Extension of the Fish Market Wharf, Aberdeen, from Present Terminus to the Graving Dock.

J. Coghill & Co., Greenock	£8,000 0 0
William Dawson, Aberdeen	5,800 0 0
Bremner, Edinburgh	5,280 0 0
Bissett & Son, Aberdeen	5,100 0 0
J. Rust & Son, Aberdeen	3,870 0 0
GEORGE JAMIESON, Woodside (*accepted*)	3,740 0 0

AMBLE.

For Branch Premises, for the Amble Co-operative Society. Mr. GEORGE REAVELL, jun., Architect, Alnwick.

R. G. Brown	£1,322 6 0
D. M. Spence	1,320 0 0
R. Carse & Son	1,263 0 0
A. Douglas	1,254 6 0
GREEN & DOUGLAS *	1,224 12 6

* Accepted, exclusive of various fittings.

BRISTOL.

For Retaining Wall against Floating Harbour at Central Electric Lighting Station, Temple Back, Bristol.

J. Durnford & Son	£2,989 0 0

Repairs to Intercepting Sewer.

Martin & Woodey	835 0 0

For Rebuilding the Lord Nelson Inn, Barton Hill, Bristol. Mr. W. B. GINGELL, Architect.

E. Walters, Bristol	£1,920 0 0
H. A. Forse, Bristol	1,690 0 0
Cowlin & Son, Bristol	1,646 0 0
W. Veal, Bristol	1,633 0 0
Stephens, Bastow & Co., Bristol	1,599 0 0
Neale Bros., Bristol	1,596 0 0
J. Perkins, Bristol	1,580 0 0
E. T. Hatherly, Bristol	1,577 0 0
E. Love, Bristol	1,549 0 0
W. Robertson, Bristol	1,519 0 0
J. Bastow, Bristol	1,496 0 0
EASTABROOK & SON, Bristol (*accepted*)	1,448 0 0

CARDIFF.

For Works, Penarth Road, Cardiff. Quantities by the Borough Engineer, Mr. W. HARPUR, M.I.C.E.

J. Rich, Cardiff	£967 18 10
T. HARRIES, Cardiff (*accepted*)	929 11 2

For Alterations and Additions to Messrs. W. Davis & Son's Premises, 11 Queen Street, Cardiff. Messrs. BRUTON & WILLIAMS, Architects, 15 Queen Street, Cardiff.

		Including for Girders.
M. Thomas & Co.	£638 0 0	—
F. Kastell	566 0 0	£65 10 0
G. H. Hodgkinson	559 19 1	48 0 0
E. TURNER & SONS (*accepted*)	495 0 0	104 0 0

For Girders and Column

	Iron.	Column.	Steel.
R. Moreland	—	Included	£175 0 0
J. Williams & Sons	£55 12 0	£7 18 6	—
Dorman, Long & Co.	—	—	35 8 4
A. D. DAWNAY (*accepted*)	49 15 6	6 10 0	37 0 0

Awards—Gold Medal, Saltaire, 1887; Silver Medal, Brussels, 1888; Silver Medal, Paris, 1889; Gold Medal, Brighton, 1889.

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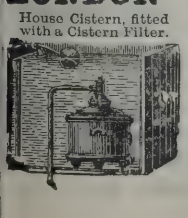
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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Edwards	1,066 0 0
Judd	1,056 0 0
White	1,035 0 0

CROYDON.

For Master's House, Sydenham Road Schools, for the Croydon School Board. Mr. ROBERT RIDGE, Architect, 12 Katherine Street, Croydon.

J. & C. Bowyer, Norwood	£804 0 0
Akers & Co., Norwood	793 0 0
J. Smith & Sons, Norwood	768 0 0
Bryan & Sons, Norwood	735 0 0
W. Smith, Croydon	735 0 0
M. Taylor, Croydon	720 0 0
H. Bacon, Croydon	719 0 0
S. W. Barker, Croydon	670 0 0
E. Bulled, Croydon	619 0 0
A. BULLOCK, Croydon (*accepted*) *	597 0 0

* Reduced to £570.

For Additions to Juniors and Infants' Departments, Mitcham Road School, for the Croydon School Board. Mr. R. RIDGE, Architect, 12 Katherine Street, Croydon.

E. Bulled, Croydon	£399 0 0
J. & C. Bowyer, Norwood	389 0 0
J. Smith & Sons, Norwood	335 0 0
M. Taylor, Croydon	332 0 0
Akers & Co., Norwood	329 0 0
W. Smith, Croydon	325 0 0
Bryan & Sons, Norwood	320 0 0
D. W. Barker, Croydon	298 0 0
H. BACON, Croydon (*accepted*)	297 0 0
A. Bullock, Croydon	269 0 0

FERNDALE.

For Building English Wesleyan Chapel, Ferndale. Mr. W. JONES, Surveyor, 56 Fountain Street, Ferndale.

C. Jenkins & Son, Porth	£2,940 0 0
W. Jones, Gloucester	2,860 0 0

FOLESHILL.

For Building Two Houses, Foleshill. Mr. THOS. F. TICKNER, M.S.A., Architect, Coventry.

C. Garlick, Coventry	£330 0 0
J. Kelley & Son, Foleshill	310 0 0
Heatherley Bros., Coventry	269 0 0

GATESHEAD.

For Works at the Team Valley Paper Mills, for Messrs. E. Richardson & Sons. Mr. S. PIPER, Architect, 52 Westgate Road, Newcastle-on-Tyne.

Tyrie & Graham, Gateshead	£567 7 0
T. Weatheritt, Newcastle	494 11 0
Hutchinson, Gateshead	478 15 4
Haswell & Waugh, Gateshead	457 12 0
HARRISON & LAWES, Gateshead (*accepted*)	435 0 0

For Building Mission Church of St. Columba, Gateshead-on-Tyne. Mr. S. PIPER, Architect, Westgate Road, Newcastle.

Middlemiss Bros., Newcastle	£2,775 0 0
Tyrie & Graham, Gateshead	2,263 17 0
J. Shepherd, Durham	2,245 0 0
Haswell & Waugh	2,230 0 0
J. Elliott, North Shields	2,197 0 0
T. & R. LAMB (*accepted*)	2,086 12 10

GOOLE.

For Forming Street and Sewers, Potter Grange Estate. Mr. TUDOR, Surveyor, Goole.

G. Walker, Leeds	£380 0 0

GRIMSBY.

For Erection of New Workhouse, to accommodate 250 Inmates, situate on the Scartho' Road, Grimsby. Mr. H. C. SCAPING (late E. W. Farebrother), Architect, Grimsby. Quantities by Mr. J. Watson, Hull.

Reed, Blight & Co., Plymouth	£33,960 0 0
Shaw, Nottingham	33,480 17 1
Hodson & Son, Nottingham	32,500 0 0
Guy & Gooseman, Grimsby	30,734 12 4
Moore, Scarborough	30,474 0 0
Marrows, Grimsby	28,997 18 2
Thompson & Sons, Grimsby	28,240 14 2
Grant, Cleethorpes	28,036 18 6
Hewins & Goodhand, Grimsby *	27,298 13 0

* Recommended for acceptance.

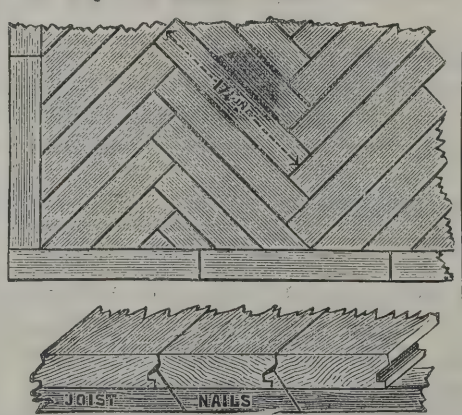
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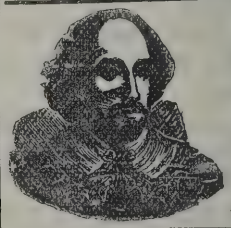
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F. Wood, Chislehurst	438 0 0
W. Owen, Farnborough	298 10 0

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G. R. Snook, Portsmouth	£1,020 0 0
W. Ward, Portsmouth	940 0 0
T. P. Hall, Southsea	909 0 0
H. Jones, Southsea	849 0 0
D. W. Lewis & Son, Southsea	840 0 0
J. Edwards, Waterlooville	820 0 0
H. McPhail, Portsmouth	805 0 0
J. Crockerell, Landport	789 0 0
J. E. Nobes, Portsmouth	769 0 0
H. T. Boulton, Portsmouth	707 12 8
W. Learmouth (*accepted*)	706 5 0

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J. Pickard, Leeds, mason	£569 0 0
Todd Bros., Leeds, joiner	410 0 0
G. Thompson, Park Lane, plumber	70 0 0
W. Atkinson, Leeds, slater	53 18 0
W. Pennington, Woodhouse, plasterer	52 10 0
J. Chappell, Beeston Hill, painter	25 0 0

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R. Stubbs, Ossett, carpenter and joiner	130 0 0
G. Fawcett, Dewsbury, slater	50 16 0
W. Haigh, Ossett, plumber	38 17 0
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Johnson & Hancock, Horbury, painter	10 10 0

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Killby & Gayford	15,706 0 0	436 0 0
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Kirk & Randall	14,713 0 0	400 0 0

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Bywaters	£2,798 0 0
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F. & F. H. Higgs	2,590 0 0
W. Downs	2,526 0 0
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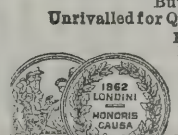
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Austin & Sons, Camden Town	£1,438 14 0
Lukes & Hooker, Blackfriars	1,175 0 0
Hunt, Bow	1,160 0 0
W. Brass & Son, Old Street	1,135 0 0
B. Nightingale, Albert Embankment	1,118 0 0
Stevens Bros., Seven Sisters Road	1,093 0 0
Jackson Bros., Gunnersbury	1,057 0 0
Matthews Bros., Portland Place	1,050 0 0
Webb, Stratford	995 0 0
A. Martin, Battersea	987 15 3
Salter, Hampstead	979 0 0
Rowe Bros., Camden Town	973 0 0

For Ironwork, Iron Staircases, &c., at the Workhouse, Homerton.

Lion Foundry	£955 0 0
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Richmond & Co.	613 0 0
Badham	580 0 0
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Johnson, Mirfield, plasterer	1,060 0 0
T. Storey, Leeds, plumber	890 0 0
Firth & Clay, Dewsbury, ironwork	348 17 6
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F. Wood, Chislehurst	549 0 0
Somerford & Son, Orpington	537 0 0
W. OWEN, Farnborough *	435 0 0

* Accepted with modifications.

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For Alterations and Additions at the Oddfellows' Hall, Union Street, Plymouth. Mr. F. A. WIBLIN, Architect.

Pellow Bros., Plymouth	£254 0 0
F. Andrews, Plymouth	240 0 0
W. Trevena, Plymouth	224 15 0
A. R. Lethbridge & Sons, Plymouth	215 0 0
Blackell & Sheppard, Plymouth	205 0 0
F. C. Ambrose, Plymouth	200 0 0
W. E. Blake, Plymouth	196 0 0
J. H. Palmer, Plymouth	168 9 0
J. Prout, Plymouth	162 0 0
H. Kerswill, Plymouth	147 0 0
A. N. COLES, Plymouth (*accepted*)	130 0 0

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For Rebuilding No. 22 Wood Street, Swindon. Mr. W. H. READ, M.S.A., Architect, Corn Exchange, Swindon.

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Miller & Holbern, Swindon	1,380 0 0
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The pinnacles of Tenterden parish church are being restored. Mr. Ewan Christian reported on their condition in 1877, and superficial repairs were undertaken in 1882, which Mr. Christian says are utterly useless. The original construction of the church, he says, was not of the most perfect kind, and the settlements and dislocation now apparent are due in a great measure to this infirmity of work.

The *Leeds Mercury* says that the Keighley Corporation, in an Act of Parliament they have recently secured, obtained the insertion of a clause prohibiting the erection of back-to-back houses in the borough.

It has been decided by the Postmaster-General that a new post office is to be built for Coatbridge if a suitable site can be secured.

The Housing of the Working Classes Committee of the London County Council, in reporting in reference to the disposal of Brooke's Market, point out that between Gray's Inn Road and Leather Lane, in the midst of many narrow courts and alleys, there was a group of dilapidated houses and sheds which, even in the worst part of London, could only be described as a disgrace to London. Some houses had recently been condemned and pulled down, and the number of persons to be displaced if the remaining buildings were pulled down was about sixty. The committee proposed that the area should be acquired by scheme under Part II. of the Act of 1890, provision being made for rehousing the persons displaced, and the remaining half-acre being utilised as an open space. The valuer had estimated the cost of the scheme, exclusive of paving works, at 4,750*l.* The committee recommended that the Council should approve of the scheme on condition that the Holborn District Board contributed 1,500*l.* towards its cost. Ultimately the Council sanctioned the scheme on condition that the Holborn District Board contributed at least one-half of the total net cost of the improvement.

The annual dinner of the Northampton Master Builders' Association has just been held at the Peacock Hotel. Some sixty members and friends sat down. Mr. J. B. Clarke, president for the ensuing year, presided, and the vice-chair was filled by Mr. Heap, vice-president. Others present were:—Mr. W. H. Smith, Mr. B. Smith, Mr. F. W. Dorman, Mr. Henry Martin, Mr. W. Hull, Mr. J. A. Piccarter, Mr. G. Stevenson, Mr. H. J. Airs (secretary), Mr. W. D. Gibbins, Mr. G. F. Fisher, Mr. C. Robinson, Mr. T. Jones, Mr. H. Green, Mr. H. W. Smith, Mr. T. Nevitt, Mr. J. Pullen, Mr. Wm. Gregory, Mr. J. Banks, Mr. Jos. Dunckley, Mr. Edwin Archer, Mr. W. Rainbow, Mr. G. H. Sharman, Mr. Geo. Goff, Mr. J. Albright, Mr. J. W. Walls, Mr. R. H. Gilby, Mr. Robert Cosford, Mr. John Bird, Mr. Edward Green, Mr. W. Dickens, Mr. J. T. Wingrove, Mr. J. Woodford, Mr. C. J. Branson, Mr. C. Sharpe, representing Mr. J. T. Sharp, Burton-on-Trent; Mr. Mr. A. C. Sharpe, representing Mr. A. Sharp, King's Lynn; Mr. W. Rayson, Mr. Josiah Walker, Mr. W. Barnicoat, Mr. W. J. Aster, Mr. H. Nurser, Mr. D. Mace, Mr. J. Bishop, representing Mr. J. T. Stanton, Lynn; Mr. J. L. Stanley, Mr. T. A. Fisher, Mr. E. D. Sharman, Mr. W. F. Agutter, Mr. H. Hensman, Mr. J. W. Walls, jun., Mr. F. Sheasby, Mr. Henry Law, Mr. G. P. Miller, Mr. T. L. Wright, Mr. Charles Day (Bath stone firms), Mr. H. Freear, Mr. Rennie Bruce (Messrs. Balmforth & Co., Luton) and Mr. Charles Tansley.—The loyal and other toasts having been honoured, Mr. W. H. Smith gave "The Architects of Northampton," a body of men of whom they were proud. The names of Mr. Hull, Mr. F. Dorman, Mr. F. Stevenson and Mr. Piccaver were coupled.—Mr. C. Day proposed "The Master Builders' Association." As far as building in the town was concerned, although not quite so large as in some other towns, it was as good as in any other part of England.—Mr. W. Gibbins proposed "The Chairman," congratulating Mr. Clarke on his succession to the office.—Mr. E. Green gave "The Health of the Vice-President, Mr. Heap."

AMERICAN NOTES.

Several years ago a charter was granted to a Canadian company for the purpose of utilising the enormous water-power of the Lachine Rapids. These rapids are only about five miles above Montreal, and the plan was to supply electricity to the whole city for a multitude of purposes. It was first necessary, however, to construct a dam across the northern channel of the St. Lawrence, which is there divided by small islands. There was great opposition to this from the municipalities along the south shore of the river, although the company's engineers declared the fear of floods to be groundless, and the scheme has not yet obtained the approval of the Department of Public Works at Ottawa. Negotiations are now in progress for the raising of 1,000,000*l.* in Europe to carry out the work as soon as this obstacle is removed.

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will give her a great advantage in the development of all such stone interests as may turn out well. The transportation question is a large and growing factor in the stone trade, and the proximity of Indiana to many large population centres, being in the centre of several populous States, must exert a beneficial effect on the future of her stone trade.

The paper, "Homelike Houses," read by Mr. Ernest Newton before the Architectural Association, is, the *Builder and Decorator* of New York says, as applicable in its criticisms upon the alien character of our modern houses to America as to England. We have many houses temporary stopping-places, but few homes.

The *Railway World*, Philadelphia, says:—The Great Northern Railway line has recently placed several large orders for bridge material and rail bolts with firms in Pittsburgh which will furnish a large tonnage for an initial line. The company is about to build a large iron bridge across the Mississippi at Minneapolis, and the contract for its construction has been let to the Pittsburgh Bridge Works. There will be between 300 and 400 tons of material used in this structure. The Great Northern is extending its line from Great Falls, Mont., to Seattle, on the Pacific coast, a distance of 900 miles, and to aid in the construction of this extension 2,000 kegs of bolts are needed. The order for them has been placed with the Pittsburgh Forge and Iron Company. They will comprise about 200 tons of freight.

Sir Douglas Fox has made a report on the feasibility of constructing a railway tunnel under the straits of Northumberland, to connect the shores of New Brunswick with those of Prince Edward Island. The greatest depth of water is 96 feet at high water, with a rise of tides of 6 feet at springs and 3 feet at neaps, and the speed of the current does not exceed three knots, with two hours of slack water at each tide. The distance from shore to shore is given at about 13,200 yards, or from shaft to shaft 13,500 yards, exclusive of land approaches, of which about 2,000 yards would be in tunnel. It is considered that about 5½ miles of railroad, including some 2,000 yards of tunnel, will be necessary beyond the shafts to connect the tunnel with the respective systems of railroad. To properly accommodate the Canadian and American rolling stock, the tunnel should have an internal diameter of not less than 18 feet. Such a tunnel, constructed in the shale, of brickwork in cement, 1 foot 10½ inches in thickness, and where feeders occur with cast-iron cases, 15 inches in thickness, with 9-inch flanges and laid with steel rails weighing 70 lbs. to the lineal yard, is estimated to cost 140*l.* per lineal yard, or, say, 1,890,000*l.* from shaft to shaft, or, with land tunnel and contingencies, a total sum of 2,225,500*l.*

The great dam across the Colorado river at Austin, Tex., is now, the Boston *Journal of Commerce* says, making substantial progress. This dam will be, when completed, 1,150 feet long, 60 feet high and 18 feet wide at the top. The up-stream face is of limestone and is vertical; the down-stream face is of Texas granite and the interior is rubble masonry of small stone and cement. There will be about 9,000 cubic yards of limestone and 50,000 yards of rubble in the dam. The estimated cost of the dam itself is 465,000 dols. To this is to be added the cost of the gate-house, the canal which is to convey the water to the manufactories and other auxiliary works, which is estimated at about 800,000 dols. more. The dam is intended to utilise the power of the Colorado river. The water-power will run the electric-light plant, furnish power for the electric railroads and for pumping the water-supply of the city, and leave a surplus of some 13,000 horse-power for the use of factories.

TRADE NOTES.

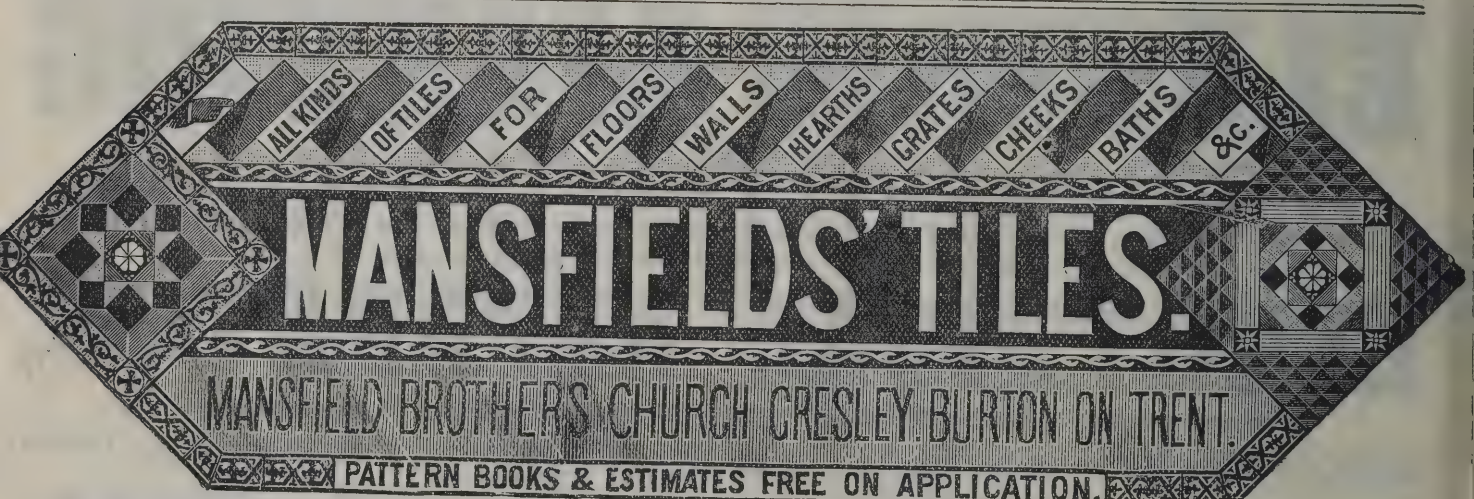
Mr. John Grundy, of 30 Duncan Terrace, City Road, London, N., is supplying his patent warm-air ventilating fire-grates to Upper Stratton School, Swindon.

A large church clock with three dials, and striking the hours and half-hours, has just been erected at Hayton, near Carlisle, by Messrs. John Smith & Sons, Midland Clock Works, Derby.

The ventilation of the new large Killarney Asylum, Ireland, has been entrusted to Messrs. Baird, Thompson & Co., ventilating engineers, London and Glasgow, their latest improved patent self-acting exhaust-roof ventilators being used throughout for the extraction of vitiated air, and their improved "panel" air-inlet wall ventilators, which introduce a supply of pure, fresh air without draughts.

The new Board Schools, North Ormesby, Middlesbrough, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

Two engineering experts have been appointed to inquire and report regarding the sufficiency of the water power available from the river Ness and the Caledonian Canal, with the view



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of lighting the town of Inverness with the electric light. It was proposed to expend 10,000*l.* in extending the existing gas supply, but the matter has been delayed pending the report.

THE superintendent of Harbour Works, Aberdeen, Mr. James Pirie, has resigned his post on account of failing health.

THE fine new parish church at Hove, Brighton, which was designed by Mr. J. L. Pearson, R.A., is having a complete electric lighting installation erected under the superintendence of Messrs. Morgan Williams & King, consulting electrical engineers, Westminster.

THE contract for lighting the well-known Irish watering-place of Bray has been given by the town commissioners to Messrs. J. E. Gordon & Co., of London.

ON the recommendation of the Watching and Lighting Committee of the Glasgow Police Commissioners it has been agreed to purchase two steam fire-engines for use in the western and southern districts recently annexed, and also two 60-feet and two 40-feet fire-escapes.

THE report of Mr. W. Vawdrey, C.E., to the Stafford Town Council, as to the completion of the contract entered into with Messrs. Warner & Co. for providing and erecting engines, pumps and boilers for the pumping station at Milford, states that the whole of the work has been completed and the machinery started some considerable time, working as required to meet the supply. The boilers are well made and strictly in accordance with the terms of the specification, each plate having the required brand, and each boiler has been tested under a pressure of 120 lbs. per square inch and found perfectly tight, with the exception of a slight weeping at two or three rivets, which have been since caulked and made drop dry. The engines, with their attachments, are well formed in every respect, and the plans and conditions have been closely adhered to. The main pumps are also well and substantially made. I am not, however, able to report that the working of the machinery has been left by the contractors altogether in a satisfactory manner, inasmuch as in several instances the work has not been put together as it should have been; this is more particularly noticeable at the main pump ends, where a jar takes place at certain parts of the stroke, which, although partly attributable to the description of pumps adopted, is chiefly, in my opinion, caused by slight errors in the erection. Having regard, however, to the fact that these engines and pumps have been beneficially at work for the Corporation a considerable time, and as the terms and conditions of the contract have been carried out to the extent of the machinery being well and substantially made in accordance with the plans and specification provided, and as, in my opinion, the objections can, at comparatively small expense, be rectified by the Corporation, it seems to be advisable to settle at once with the contractor upon reasonable terms rather than let the matter remain open longer.

IN the case of the West Highland Railway Company against their contractors, Messrs. Lucas & Aird, the Sheriff-Substitute Gebbie authorises the Railway Company to carry on the railways and works, to relet the same or part thereof, and for that purpose to take possession of the railways and works and all materials, tools and implements, and declares the interim interdict formerly granted perpetual; finds the pursuers entitled to expenses, allows an account thereof to be given in, and remits the same, when lodged, to the auditor to tax and report, and decerns. An appeal has been lodged by Messrs. Lucas & Aird in the Scottish Court of Session.

THE London County Council have passed a recommendation of the Main Drainage Committee, that for the purpose of introducing the system of continuous treatment of the sewage at the Crossness outfall, the necessary weir walls be erected, and that this work be executed under Mr. Webster's contract for the precipitation works.

VARIETIES.

IN recognition of service to art in the Midland Counties, and notably by the gift of his unique collection of local ceramics to the Derby Art Gallery, Mr. Felix Joseph is to receive some very exceptional honours at the hands of that Corporation on the 21st inst. A special meeting of the Town Council has been called by the mayor (Sir Alfred Seale Haslam) for the afternoon of that day, at which a magnificent illuminated address, similar to the one accepted by Her Majesty, is to be presented to Mr. Joseph, with some fine specimens of modern Derby china, expressly manufactured for the occasion. In the evening Sir Alfred and Lady Haslam have invited 500 of the leading residents in town and county to meet their guests at a conversazione to be held in the Art Galleries, built by the munificence of the late Mr. Michael Bass, father of the present Lord Burton.

THE committee appointed for the restoration of the Wellington Monument at Wellington, Somerset, have decided

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that the repair of the obelisk shall be commenced at the earliest possible time next year, and that in the meantime any practicable work to prevent further dilapidation should be carried out. The amount required in its entirety is about 1,200*l.* The lowest tender for simply repairing the present dilapidation is 468*l.*

The Coventry City Council have received from the Local Government Board their sanction to borrow 4,479*l.* for improvements in Cox Street and Hill Street.

A movement has been started by Mr. Oscar Paterson at Glasgow for the institution of a Society of Ceramic Art for the study, examination, criticism and discussion of antique and other pottery, porcelain, glassware, stained glass and enamels, and to afford collectors of the antique, antiquaries, archæologists and students of industrial art a medium of communication and interchange of opinion on the subject of ceramic art and cognate matters.

An inquiry has been held by the Local Government Board into the application of the Corporation of Mossley for powers to borrow money for the purchase of the Whitehall estate, which they intend utilising for a Town Hall and pleasure grounds.

A scheme of improvements for Ilkley has been brought before the Local Board. It includes laying out the Rhyddings as a public pleasure-ground, improving certain of the public roads, building a new depôt and board offices, stabling, cottages, house for superintendent, a fire brigade station, public slaughter-houses, stores, shedding, workshops, &c. It was resolved to apply to the Local Government Board for sanction to borrow the sum of 10,000*l.* for the purpose of carrying out the works.

At the meeting of the Glasgow Corporation the Libraries Committee reported that having had their attention directed to a property on the east side of Queen Street, which was for sale, and the site of which might be utilised for an extension of the library premises, they recommended the Town Council to authorise 17,000*l.* to be offered for it, provided it was exposed for sale at or under that price. The recommendation was adopted.

A grand organ is to be presented by Provost Alexander, of Coatbridge, to the municipal buildings now in course of erection for the town.

The Aberdeen Incorporated Trades have decided to lay out as model gardens for working-men a portion of the ground at Gallowhill belonging to the Incorporation, extending along the south side of Trinity Cemetery, from the old Powder Magazine to Park Street.

Plans have been prepared by Messrs. D. & T. Stevenson, C.E., Edinburgh, for the construction of a timber pier and wharf at Uig Bay, Skye. The pier, which will consist of greenheart piles, will be about 1,000 feet in length.

The Aberdeen Harbour intends to spend 12,000*l.* in widening and improving Waterloo, Trinity and Market Quays.

The Widnes Local Board, in conjunction with the Runcorn Improvement Commissioners, intend to memorialise the County Councils of Lancashire and Cheshire in favour of the construction of a bridge for vehicular traffic across the Mersey between Widnes and Runcorn. The work would be very costly, as the river is about a quarter of a mile wide.

The Leith Dock Commissioners have decided on constructing a dry dock at an estimated cost of 25,000*l.* to the south of the Prince of Wales's Graving Dock, plans for which are to be prepared.

At the meeting of the Malvern Local Board, it was resolved to advertise for tenders for carrying out the projected works for a new water-supply and for a loan of 40,000*l.* The plans have been drawn up by Mr. Copland, C.E.

A committee of the Ilkley Local Board have recommended that an Act of Parliament should be obtained for the compulsory purchase of the gas undertaking and the providing of an additional water-supply.

The purchase has been agreed to by the Walsall Town Council of 3,384 square yards of land in Lichfield Street from Lord Hatherton, as the site for public baths, at the price of 1*l.* per yard. It is stated that about 1,000 yards would be available for use for other purposes, or for sale.

At Dundee the Police Commissioners have condemned a property in William Street, King Street, inhabited by about a dozen tenants, as uninhabitable; and a number of owners of properties in Black's Croft have been granted a month to submit plans showing improvements of their buildings.

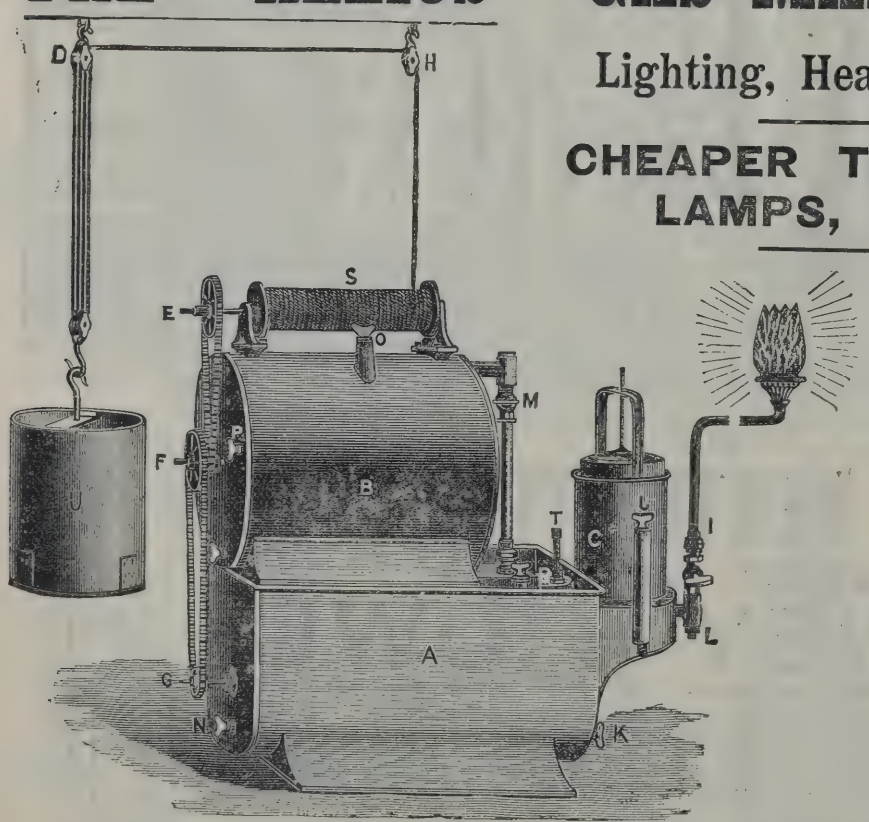
At Balsall Heath a Local Government inquiry has been held with respect to applications by the Local Board for sanction to the borrowing of 5,960*l.*, for laying out a recreation ground and for street improvements, and 13,704*l.* for law costs and other charges arising out of the actions between the Board and the Warwick and Birmingham Canal Company and the King's Norton Rural Sanitary Authority.

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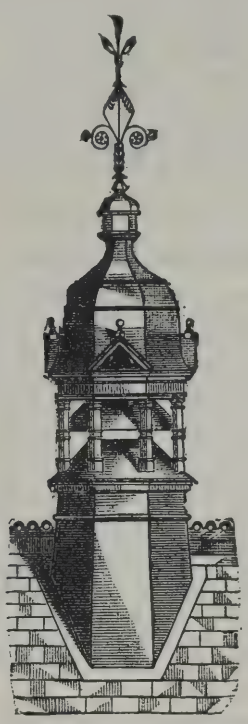
THE assistant borough surveyor of West Hartlepool, Mr. Matthew Scott, has been appointed surveyor for South Stockton.

HOUSE LETTING IN PALERMO.

A CURIOUS custom which prevails at Palermo in regard to house letting is mentioned by the British Consul at that place in his last report. All houses must be taken in the month of May for possession on September 1 following. A more inconvenient arrangement it is almost impossible to imagine, since the changing of houses and apartments (and the Palermitans change very often) takes place universally on August 31, generally one of the very hottest days of a hot summer. "The confusion of the furniture and goods of outgoers and incomers, and the amount of perspiration and swearing rendered necessary must be witnessed to be realised; the porters and furniture movers have a hot and busy but lucrative time of it, and take advantage of the pressure of business in the way of increased terms. Sometimes the streets are quite encumbered with masses of ingoing and outgoing furniture, not to speak of countless heavy articles of furniture being lowered from the uppermost floors and suspended in mid-air. During the year of the last cholera epidemic here," the Consul says, "the municipality wisely forbade people to change houses at the usual date, but we are coming back to the old custom. After September proprietors abandon hope of letting apartments for another year, although they will not object to entertain the notion of letting a house for a broken year if a foreigner applies. This, however, is an irregular and temporary arrangement; a regular lease must run from September 1, and the rent for the whole year, as a rule, be paid in advance, especially by foreigners."

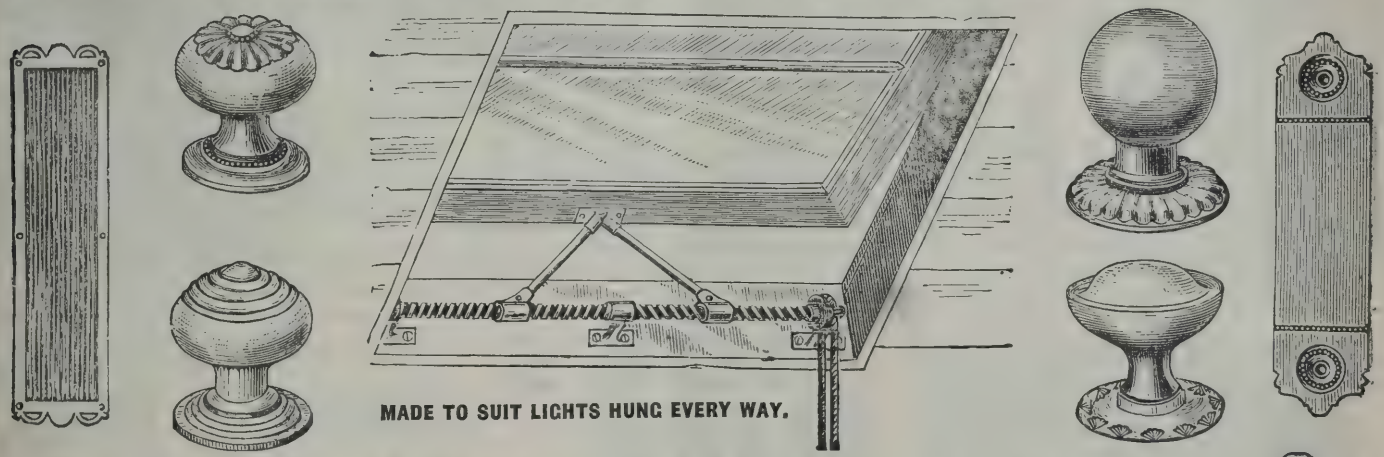
NOTES ON NOVELTIES.

WE have had lately brought to our notice several new designs of the "Grahtryx" fixed self-acting exhaust roof ventilators, patented and manufactured by Messrs. Baird, Thompson & Co., the well-known ventilating engineers, of London and Glasgow. These ventilators can be made suitable to harmonise with any style of architecture, with or without base and flange, as shown, and to architect's designs, or in plain designs for use in turrets at a very moderate cost. They have also been recently improved, and are an excellent apparatus for the efficient extraction of vitiated air from public and private buildings, soil-pipes, &c. The illustration shows their No. 10 design, which is being adopted for the two large new schools erected by the Falkirk School Board from designs by the School Board architect. The "Grahtryx" ventilator is extremely simple in action, is



free from noise and the interior arrangements are so complete that it is proof against the admission of snowdrift and rain, and from whatever direction the wind blows it creates a powerful upward current without any possibility of a blow down. The whole of these ventilators are made of strong galvanised steel plates of the best quality by an entirely new method not dependent upon solder, thus assuring great strength and durability.

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ONE of the great desiderata in the building world is a lock that will never get out of order, and yet is efficient in every sense of the word. Whilst visiting the Dairy Exhibition at the Agricultural Hall this week, our attention was drawn to a well-assorted selection of locks and latches, the inventor of which claims that there are no springs in its mechanism, that the handle, which is of a unique construction, cannot work loose, and that neither require oiling at any time. Both lock and handle work on the gravity principle. The invention will probably be brought out by a company, and works that are already in successful operation abroad will be included in the purchase. We understand that Mr. Freemer, of 200 and 202 Phœnix Street, N.W., is interested in this introduction.

IMPROVED TELEPHONES.

OUR contributor last week, in the article "Improved Telephones," gave some particulars which seem to require describing more clearly. We may therefore state, first, with regard to the "Sphinx," that Messrs. Grist & Turner only claim that it is 50 per cent. cheaper with reference to the combination movable telephone; secondly, their intercommunication system cannot be used by a firm to communicate with its clients, because, in the first place, this would constitute an "exchange" and would require a license from the Post Office, which it is impossible to obtain; and, thirdly, if the offices of the clients were some miles apart the system would be too costly. The system is intended for a large firm which has many departments or offices scattered about at a distance of a few hundred yards each. Messrs. Grist & Turner are the only firm who make a specialty of this work. Fourthly, the Co-operative Wholesale Society, Limited, Manchester, have two immense blocks of buildings but not shops in different parts of the city, the length of the cable being about half a mile.

PROMENADE PIER, TORQUAY.

THE committee appointed by the Torquay Local Board to inspect promenade piers at various watering-places have reported that they visited Plymouth, Great Yarmouth, Lowestoft, Hastings, St. Leonards, Eastbourne, Bournemouth, Brighton and Scarborough, and inspected the piers. They recommend the construction of the proposed pier at Torquay, and that it should be erected in connection with the present groyne. That it should be constructed of iron screw piles and wood decking, so as to give an approach for a distance of 736 feet, or thereabouts, 30 feet wide, and a height of not less than 9 feet above high water, the widened portion being placed on the Tor Abbey side of the structure; that the width of the angle, and for a distance of about 214 feet, be similarly constructed not less than 100 feet for the purpose of enabling a suitable pavilion, at least 70 feet wide, with sheltered seats, to be erected thereon; that the outer length or cant of the groyne to the end thereof be similarly widened out and at the height previously mentioned to a width of 50 feet, and provision made for the erection of a band-stand and shelters, and that landing-places in suitable places be provided; the whole to be carried out for a total estimated capital outlay of 30,000*l.* The committee recommended the necessary steps being taken to apply to the Board of Trade for a provisional order to carry out the work. The scheme could be made a progressive one, and the work carried out in four sections, the respective cost of which would be 7,000*l.*, 7,000*l.*, 8,000*l.* and 6,000*l.* Plans for the work have been submitted to the Board.

THE PURIFICATION OF RIVERS.

AT the annual Congress of German Naturalists and Medical Men, just held at Halle, an interesting paper was read in the hygienic section by Professor Von Pettenkofer on the self-purification of rivers. His researches and experiments were made on the waters of the river Iser at Munich, but they can be applied to the water of all town rivers. Munich has 280,000 inhabitants, and 20,440 kilogrammes of refuse are carried into the river every day. But, again, each day 3,456,000 cubic centimètres of fresh water flow down the stream, so that the proportion of refuse or dirt to the water is only 6 to 1,000,000, or 6 milligrammes to the litre, a pollution which if artificially produced in a glass of water is unrecognisable to the naked eye. Careful examination has shown that even this pollution disappears seven kilomètres below the city. This self-purification of rivers had hitherto been attributed to sedimentary deposits, but Pettenkofer is convinced that it is the effect of oxygen, partly freely dissolved in or absorbed by the water, and partly produced by water plants. He considers that the great quantity of low vegetable organisms in water plays a great part

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in the purifying process. The vegetable growth in river beds should, according to Pettenkofer, be protected, and refuse water from mills, chemical works, &c., which is destructive to vegetable growth, should not be allowed to flow into rivers unpurified.

HEALTHY DWELLINGS.

One of the latest extensions of the work of the Yorkshire College, says the *Leeds Mercury*, is the institution of a Department of Sanitary Engineering, and Mr. W. Spinks, A.M.Inst.C.E., delivered the first of a series of lectures on the subject in the Philosophical Hall, Leeds. The particular branch of the subject chosen, the question of "Healthy Dwellings," coming in the midst of the discussion that is now going on in the town as to back-to-back houses, and the condition of the slums of Leeds, naturally attracted a large audience.

Mr. Jno. Marshall, chairman of the Council of the Yorkshire College, who said he filled the position of *locum tenens* for Dr. Pridgin Teale during his temporary absence, expressed the pleasure of the Council of the Yorkshire College to be able to add to the teaching they offered lectures on sanitary engineering, the object of which, as he, an unscientific person, interpreted it, was to diminish the amount of preventable disease and death from preventable disease. That was an aim which must come home to all of them, and he was glad that the action of the County Council had enabled them to bring Mr. Spinks to address them.

The lecturer remarked that the application of the principles of health, though a science as old as humanity, had only obtained a recognised position very recently. Of late years a strong feeling had grown up that the general health was one of the most important cares of a Government. The tendency of men to collect for their profit in large cities and the immense development of trade, had aggravated the causes of infection, and created the duty of protecting the population against the manifold causes of insalubrity. The material causes of deterioration and disease were principally impure air, impure water, insufficient and unwholesome food, dampness of soil, deficiency of warmth; and the removal of these causes was the principal aim of practical hygiene as enforced by legislative enactment. From 1875 to 1890, thirty-three Sanitary Acts applicable to the country had been passed, the principal of which were the Public Health Acts, 1875, and Amendment Act, 1890, the Infectious Diseases Notification Act, 1889, the Infectious Diseases Prevention Act, 1890, and the Housing of the Working Classes Act, 1890. Dealing first of all with the necessity of a house being properly sewered and drained, and condemning the system of dry closets as well as the pail system, Mr. Spinks turned to the question of streets and passages, and pointed out that the streets around the dwelling-houses of the working-classes were, as a rule, the playground of the children. So that when streets were unpaved or paved with stones that allowed water to gather and collect, the children playing near it breathed the emissions from the filth and dirt which would not reach the adult. In the paving of back yards and passages it would be a good thing if the local authorities were a little more particular in the choice of the material they used. The Housing of the Working Classes Act was, he said, one of the most important that had been passed for a long time. It was divided into two parts, the first dealing with unhealthy areas, and the second with unhealthy dwellings. It provided that if twelve ratepayers signed a petition declaring what they believed was an unhealthy area, it was the duty of the medical officer of health to inquire into the matter. And as they had a number of back-to-back houses in narrow, confined streets, where it was almost impossible for the air to circulate, and where the plaster and floors and other porous materials in the houses were impregnated with miasmatic matter, making it impossible for any one to live properly, the value of such a clause was very great. Again, if four persons were of the opinion that the existence of a house or building was prejudicial to the proper circulation of air to other houses, they had the right to draw the attention of the authorities to the matter, and expect them to take action. In Leeds and other large towns they had rows upon rows of houses which looked very gorgeous and noble from the outside, but which were very deceptive, and one found on getting inside the house that he was obliged to come out the same way. The particular question of back-to-back houses had been thoroughly and carefully investigated about three or four years ago by Dr. Barry and Mr. Gordon Smith for the Local Government Board. There was no doubt that their conclusions were that back-to-back houses were simply the device of what he would call the "land sweater." They decided (1) That the practice of building houses without provision for through ventilation is still in vogue to a considerable extent in many Yorkshire towns; that in some districts the proportion of such houses to houses provided with means for through ventilation is very large and is steadily increasing. (2) That the erection of houses upon the back-to-back principle,

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Fig. A.

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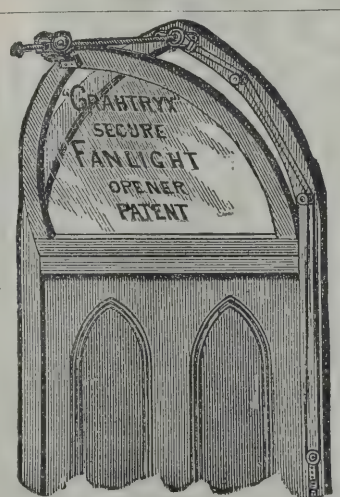
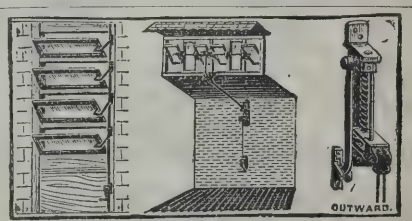


Fig. B.



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in the way commonly practised, tends to promote the huddling of houses, and the consequent crowding of persons upon an area to a degree which is incompatible with health. (3) That so far as structure is concerned, certain facilities exist in back-to-back house construction under which the efficiency of party-walls may be less than in the case of through houses, but that otherwise the details of house-construction generally are similar in both classes of houses. (4) That little or no improvement has taken place in the ventilation of back-to-back houses themselves, and that this applies even in districts where, under comparatively recent regulations, not more than four or eight houses may be built in one block. (5) That improvement in the method of excrement disposal has continuously gone on in the districts visited, but in this respect much still remains to be done. In some cases grave disadvantages to decency and health accrue from the custom still prevalent in certain districts of grouping privies in blocks at an excessive distance from the houses, a practice which is still more objectionable when each such privy has to serve the inhabitants of two or more houses. (6) That the accommodation afforded in through houses is usually superior to that afforded in back-to-back houses of a similar extent. (7) That the difference in the cost of construction of a through house and a back-to-back house respectively, each affording the same accommodation and built equally well, is very slight indeed; the advantage, such as it is, being with the back-to-back house. The medical officer of health for Manchester had just presented a report to the Council on the subject of back-to-back houses in the slums, and it had been decided to demolish the whole lot, 9,300 in all. If the powers conferred by these new enactments were only taken advantage of, they would have the effect of doing away with the jerry-builder, the property-jobber and the land-sweater. In conclusion, the lecturer supposed the possibility, by the adoption of proper precautions, of reducing the death-rate in a district of 10,000 people from 24 to 14. That meant a saving of 100 lives per annum, a diminution of the sickness rate and a consequent saving in cost of medicine, of funerals, of wages earned, of 8,185*l.* 10*s.*

Dr. Pridgin Teale, who had taken the chair, expressed the belief that the authorities of the Yorkshire College must be gratified at the large numbers in which they had met together, as that evening marked a somewhat strange departure in the history of the college. It was the inaugural lecture of a gentleman appointed to a new lectureship, which in itself was due to a grant of money from the West Riding County Council. It was marvellous to think what strides had been made in the question of the public health, and then Dr. Teale described at some length the education of the medical officers of health, the improvement in the condition of the education of the plumber, on whose work the health of the country so largely depended, and the better education of sanitary inspectors, and to these two latter classes, and to young architects and builders, he argued, the initiation of this lectureship must prove of immense benefit.

PRESSURE ON WALLS OF SWIMMING-BATHS.

At the last meeting of the Stafford Town Council a report was read respecting the defects in one of the walls of the swimming-bath. The Baths Committee decided to repair the breach immediately and to build a continuous buttress around the bath, the dimensions of which should be determined by the borough surveyor. Mr. Matthews, in moving the adoption of the report, said the fracture which took place in the bath was 5 yards in extent, and the cost of repairing would be 17*l.* 6*s.* The expense of erecting the continuous buttress and concreting would amount to 56*l.* The breach in the wall had been rebuilt and the subway bottom was being concreted to a height equal to the bottom of the swimming-bath at the deep end. At the back of the deep end the concrete would be carried to the top of the bath the same thickness throughout, thereby connecting the deep end of the bath with the main wall of the building. The committee resolved upon this somewhat extreme course for the purpose of inspiring the necessary confidence of the public in the bath. The borough surveyor proposed as the work of concreting was being done to admit the water slowly to the bath in order that the necessary moisture might get to the lias lime and so enable it to set. After expressing the regret of the committee at coming before the Council with such a report, Mr. Matthews said there were two reasons brought forward at the committee meeting to account for the fracture. One was whether the wall was sufficiently strong, and the other was whether sufficient time had been allowed for the walls to knit together before the water was let in. The committee were compelled to accept both of these reasons and to act upon them, and the report of the committee was based upon them. The error which had been discovered by experience was that they should have admitted the water gradually to the bath. He pointed out that the lime in the wall had not to dry as many people supposed, but to set, and that the water was an absolute

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necessity in order to allow this to take place. There was no truth in the rumour that the matter had been rushed for the purpose of opening the baths. Six months ago contracts were completed for the building of the baths, the intention being that the swimming-bath should be opened in three months' time. Had the dates been adhered to, the bath would have been opened at the end of July, and that being the case would any one have said, had the bath broken down, that the committee were rushing the matter? Instead of hurrying, they had had a continuous series of delays, and if the committee had not urged the work forward with a view to obtaining revenue from the bath during the remainder of the swimming season, he presumed the committee would have been charged at the hands of the Council with great remissness. There was at no time any apprehension whatever of danger resulting from immature work, and it was not until after the accident that it was found that the time for filling the bath instead of being one day should have been perhaps two or three weeks. The figures prepared by the borough surveyor would prove, he believed, that while the pressure of the water would be 12 cwt. per lineal foot, the resisting power of the concrete would be more like 37 cwt. per lineal foot. In conclusion, Mr. Matthews pointed out that the plans for the erection of the baths, which were prepared by the borough surveyor, were sent to the Local Government Board and passed successfully. Mr. Flamank declined to second the adoption of the report, as he did not agree with the decision of the committee. Alderman Wright seconded the motion. Alderman Peach alluded to the fact that there had been another report presented by the borough surveyor, which the committee had not had time to discuss fully and properly. As the committee would meet shortly to discuss that report, he proposed an amendment that the discussion be adjourned till the next meeting. Mr. Wormal seconded the proposition. Mr. Bagnall, having suggested that the plans of the whole bath be submitted to a professional gentleman, the amendment was carried.

THE NEW RAILWAY TO LONDON.

As has already been reported, the Bill promoted by the Manchester, Sheffield and Lincolnshire Railway Company to authorise the extension of their system to London will be again brought before Parliament in the coming session. In the main the measure will be very much what it was when rejected by Mr. Woodall's Committee, but it has undergone important modifications in detail, with the view of meeting the more serious objections raised against the scheme last session. These modifications chiefly affect the question of the proposed London terminus, the plans for which have been considerably altered and extended. Some deviations from the route originally laid down between Beighton Junction and Quainton Road are also provided for to meet the requirements of local authorities and landowners. Besides the St. John's Wood land—to the disturbance of which such strong objection was offered by artists and others resident in the locality—it is now sought to acquire the ground bounded by Grove Road, the north side of Church Street, Edgware Road, and St. John's Wood Road. This is in No. 3 ward, half of which, it is estimated, will be swept away for railway purposes if the new project be sanctioned. Then in No. 4 ward the land needed extends from St. John's Wood Road to Marylebone Road at the corner of Allsop Place, and thence to Lisson Grove, excluding the Grove itself, but the plan contemplates a line from Harewood Place to the corner of Alpha Road. Thus nearly the whole of No. 4 ward would be occupied by the new railway project should it prove more fortunate in the House of Commons than the old one.

THE BIRMINGHAM WATER SCHEME.

THE following is the report of the Water Committee of the Birmingham Corporation on the proposed source of supply :—

The necessity of extending the sources of the water supply of Birmingham and the district supplied by the Corporation is so fully recognised that we need spend no time in dealing with this part of the case. Last year the daily average demand for water reached its highest total, 17 million gallons, rising on some days to a maximum of 22 million gallons. Towards meeting this demand we obtain from the streams and rivers controlled by the Corporation about 8 million gallons daily, and from deep wells sunk in the sandstone about 9 million gallons per day, which will be increased by the new well at Rubery to 10½ million gallons. The storage reservoirs at Whitacre are capable of yielding in times of extreme pressure, from dry weather or from increasing demand, an additional supply of about 3 million gallons daily. Altogether therefore we have resources equal to the supply of 22 million gallons of water daily. But the demand steadily rises, at the rate of about 3½ per cent. annually, and consequently in a very few years our means

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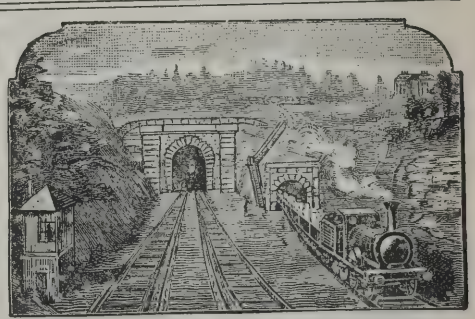
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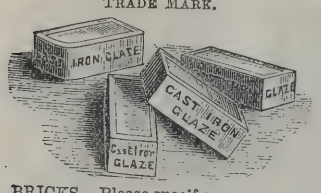
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of supply will not be more than equal to the average daily consumption. It is needless to point out the consequences of a water supply inadequate to the demand; the dangers of shortness of water, and still more those of a water famine, will be realised by every consumer. It is necessary therefore to make provision for an increased supply. But how? It might be possible, by an expenditure of something like 2,000,000*l.*, to so extend the existing works as to make them adequate for perhaps twenty years, by making new storage reservoirs at Whitacre and by sinking additional wells in the sandstone—twenty-five, at least, of such wells being required. But the present gathering-ground in the watershed of the Blythe and the Bourne is deteriorating in character, owing to high cultivation and the increase of buildings; and besides we have no assurance that the sandstone wells would bear the enormous additional strain which would be thus imposed upon that source of supply. Even if the plan above indicated were to be adopted, it would meet the necessity only for a limited period, and long before that period had elapsed—say, in twelve years' time at the farthest—it would be imperative again to look ahead for new supplies. Our own district being exhausted, we should then have to go to some remote mountain region for our water supply; but by that time the best available gathering-grounds would have been appropriated, and Birmingham would find itself at a deadlock. Therefore—it is a demonstration—the wisest, safest and ultimately the most economical course is to go further afield at once, and to make such a provision as to insure the security of our water supply for at least fifty years to come.

The necessary conditions of a satisfactory water supply have to be kept in view in deciding this vital question. There are five essential conditions to be satisfied:—(1) Ample quantity of water; (2) certainty of maintaining the supply; (3) purity of the water; (4) impossibility of future contamination; (5) delivering the water by gravitation, to save the cost of pumping to a high level, which is now requisite in Birmingham, for all the water we use has to be pumped a height of about 250 feet. All these conditions are satisfied completely by the district recommended by the Water Committee as the gathering-ground of our future water supply, namely, the watershed of the rivers Elan and Claerwen, near the little town of Rhayader, in Mid-Wales, distant about eighty miles from Birmingham. This district was suggested nearly twenty years ago by Sir Robert Rawlinson as the source best adapted to the requirements of Birmingham; and the judgment of this eminent engineer has, after recent examination and inquiry, been confirmed by Mr. J. W. Gray, the engineer to the Corporation Water Committee; by Mr. Mansergh, the engineer called in by the committee to advise them; and by such authorities as Sir Frederick Bramwell and Mr. Hawkesley, who have likewise minutely examined the ground. The area of the watershed is ample; it covers 70 square miles, or about 46,000 acres, nearly six times the present municipal area of Birmingham. The quality of the water, tested carefully by chemical and other experts, is unimpeachable—it is pure and soft. The freedom from possible future contamination is beyond question, for on the 70 square miles there are fewer than 200 persons, and no more can come there, for the district is incapable of cultivation, and therefore cannot attract residents, and there are no roads which visitors can traverse. As to quantity and certainty of supply, these are demonstrated by the fact that the rainfall, taken for a series of years, shows an average of 66 inches a year, as against 28 in the valley of the Blythe and the Bourne, our present gathering-ground for river water; while, owing to the conformation of the valleys of the Welsh district, the storage capacity may be raised to any degree that can possibly be required. As to delivery by gravitation (thus obviating the cost and risk of pumping), it is enough to say that the lowest contemplated reservoir is 800 feet above sea-level, or about 200 feet above the highest point of Birmingham, and that other reservoirs are projected at a height of more than 1,000 feet above sea-level. Thus, all the essential conditions are complied with—amplitude of supply, certainty, purity, guarantee against deterioration and delivery by gravitation, in other words, by a perpetually running stream.

We do not, of course, presume to think that our opinion can add confirmation to the judgment of experts in water supply; but this is a case in which the main conditions can be justly estimated by those who do not pretend to expert knowledge; and no one who examines this district of Mid-Wales can fail to be satisfied as to its remarkable suitability to the designed purpose. After having carefully gone over the valleys of the Elan and Claerwen, examined the watersheds of both rivers and inspected the sites of the proposed reservoirs and works, we have no hesitation in saying that the district chosen by the Corporation engineers is a perfect source of water supply for a great and growing town. Standing beside the upper reaches of the Elan, six or eight miles above Rhayader, a good general view of the district can be obtained, and the characteristics which mark this portion of the watershed also mark that of the

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Claerwen, which is divided from the Elan by a range of hills rising to about 1,600 feet. The base of the hills and valleys is the slate formation, on which grows a short and scanty vegetation, just capable of yielding sustenance to a few sheep. There is very little bog or peat; the water from the hillsides runs into the two streams above mentioned, which are exquisite in their purity and freshness. The landscape is wild beyond description: broad valleys, low rolling hills, rising into higher ridges to an altitude of about 2,000 feet. There is no sign of life beyond the scattered sheep, and here and there a solitary shepherd; there are no dwellings but a few shepherds' huts and an occasional house of a sheep-farmer, and these are so rare that they have to be searchingly sought for before they can be discovered. There is no cultivation of any kind; on the Elan watershed and the upper portion of the Claerwen side there is no wood—not so much as a solitary bush. Since nature finished her work and cast this district into its final mould, there has been no change in it; nor, within the view of human prevision, can there be change. Everywhere the eye rests upon a vast solitude, bathed in the purest air, swept by the freshest winds, a landscape brown and bare, clothed only with the scantiest herbage, broken only by transparent rills. Nothing wilder or remoter or more solitary or freer from any chance of change can be imagined. It is an ideal gathering-ground for the purest water; if nature had arranged it for the purpose it could not have been more perfectly fitted to its intended use. The conformation of the ground is adapted admirably for storage. The valley basins, surrounded by lofty hills, constitute reservoirs which seem to be made ready to the hand of the engineer; all that is needed—and this at no great cost, or necessitating specially elaborate works—is to throw here and there a dam across the river courses; and then the river beds themselves and the hills on each side will form the beds and the retaining walls of the storage lakes, while the materials for the construction of the dams required are to be found in abundance on the ground.

It is impossible without the aid of a map to describe the river courses, or to explain the situation of the dams which are to bank up the streams into lakes. We can therefore only speak generally. We have already mentioned that the rivers Elan and Claerwen flow through valleys on either side of a dividing range of hills. At the base of this range they meet and unite at a point in the Claerwen Valley, called Nant Gwilt, and thence under the single name of the Elan the conjoined streams flow on into the Wye near Rhayader. At Nant Gwilt, just below the confluence of the streams, it is intended to construct the principal dam, and to form the chief storage lake; the exact site is named on the Ordnance map as Caban Côch. Here the retaining dam will stretch across the valley at a height of 80 feet, and the top level of the water will be 800 feet above sea level. The lake will not be one sheet of water visible at a glance, but will follow the lines of the valleys and the hillsides, being half a mile across at its broadest, narrowing in its numerous reaches and inlets, and varying in its depth according to the configuration of the landscape contours. Its total length will be something over three miles, its total area will be 497 acres, and its total storage capacity will be 7,540 million gallons of water. These figures are scarcely capable of being realised, but a standard of comparison may be afforded by the statement that our present reservoirs at Whitacre have an area of 90 acres and a storage capacity of 600 million gallons. All the water in the Caban Côch will not, however, be at the disposal of Birmingham, for we shall have to make compensation to the rivers below the great storage lake, and the overflow will consequently run into them. But no one need be alarmed at the prospect of this necessary compensating arrangement, for the complete system contemplated includes five other reservoirs, situated higher up than the great lake of Caban Côch. Two of these are to be placed upon the river Elan, and three upon the river Claerwen. The names, areas and contents of the whole of the reservoirs are as follow:—

	Area in Acres.	Storage Capacity in Million Gallons.	Height above Sea Level.
(*a*) Caban Côch . .	497	7,540	800
(*b*) Dol-y-Mynach . .	148	1,500	900
(*c*) Pen-y-Gareg . .	124	1,320	945
(*d*) Craig-yr-Allt Côch .	217	2,000	1,040
(*e*) Cil Oerwynt . .	269	3,100	1,095
(*f*) Pant-y-Beddau . .	244	1,900	1,175
Totals . .	1,499	17,360	—

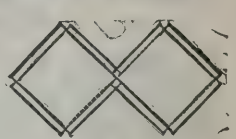
Caban Côch, as already mentioned, is below the confluence of the Elan and the Claerwen; Dol-y-Mynach, Pant-y-Beddau and Cil Oerwynt are on the Claerwen, and Pen-y-Gareg and Craig-yr-Allt Côch are on the Elan. All these storage reser-

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voirs, however, will not be made at once. Caban Côch, the largest, will come first, and probably two of the others will be constructed immediately afterwards. The rest will be brought into use as they are wanted for future supply—twenty years hence perhaps or more than that, while the highest of all, Pant-y-Beddau, may not be required for fifty years to come, when the whole service of over 60 million gallons daily may be necessary for the supply of Birmingham and its neighbourhood.

We have now described the sources of the supply and the arrangement and capacity of the storage reservoirs. We have next to see how the stored-up water is to reach the consumers in Birmingham. Eighty miles have to be traversed before the delivery is accomplished, and on the route chosen by the engineers it will be possible to bring the supply in what is virtually a straight line, involving no special engineering difficulties. The delivery will start with a short tunnel from the Caban Côch reservoir, and will then be continued by varying means—iron pipes, cut-and-cover work (that is, a covered conduit), and occasional tunnels through intervening rock. The course will run past Rhayader, Knighton, Ludlow, Cleobury Mortimer, Bewdley, Hagley, to Frankley, where a reservoir will be constructed, and from that reservoir the supply will flow on to the Monument Road reservoir, and thence it will be pumped up to a higher reservoir to be made at Warley, for the convenience of the highest portion of the district which cannot be satisfactorily reached by gravitation. The proportion of tunnels, conduits and pipes may be roughly stated as about nine miles of tunnel, 35 miles of "cut-and-cover" conduit, and 35 miles of iron pipes. The conduit and the tunnels will be made of the full capacity required for the ultimate full supply, namely, 8 feet in diameter. The iron pipes will be 42 inches in diameter. When the scheme is completed—say fifty years hence—five of these pipes will be required. For the present only two pipes will be laid, additions being made as the demand increases. The first portion of the work, it is computed, will be completed in ten years from the passing of the Act of Parliament needed to authorise the execution of this vast project.

Now, finally, for the cost. Here we can do no more than transcribe the estimates of the engineers, for they alone are capable of making an estimate, and with them the responsibility of it necessarily rests. Two reports are presented on this part of the matter—one by Mr. Mansergh, and the other by Mr. Gray. The estimate of Mr. Mansergh is that for the first portion of the work—all that we shall need to execute for many years to come—the cost will be 3,340,700*l.* This will include the making of the great reservoir, and probably two others, the provision of the full-sized tunnels and conduits and of two lines of iron pipe. For the ultimately complete scheme, including the six reservoirs and five lines of pipe, Mr. Mansergh's estimate of the cost is 5,654,953*l.* In these estimates we observe Mr. Mansergh includes a very large allowance for contingencies, amounting in the complete scheme to no less than 1,027,676*l.*—an allowance which is sufficiently cautious, doubtless an error on the right side, if it is an error at all. Mr. Gray reports that, having made an independent estimate of "the works on the Elan and Claerwen streams, and of the aqueduct, reservoirs, filter-beds and main pipes necessary to deliver the waters from these streams to the reservoir of the department at Monument Road," he is of opinion that "the estimated cost of these works [that is the first portion], amounting to 3,340,700*l.*, is sufficient for the works therein stated"—that is, in Mr. Mansergh's estimate. Some other works, estimated by Mr. Gray at 281,250*l.*, for the improvement of our present service within ten years, will have to be provided for in the proposed Bill, and provision will also have to be made for the extension of mains for forty years to come; but these latter amounts will of course be applied only as the demand for them requires. The finance of the scheme is described in the report of the Water Committee. The committee expect to cover the cost in three ways:—First, by raising the water-rents by the sum of 28,000*l.* a year, thus reimposing part of the reductions conceded some years ago, accumulating this amount until it is needed by the expenditure on the scheme; second, by postponing the repayment of capital for, say, ten years from the commencement of the scheme; and third, by the growth of water-rents, which, it is calculated, will have so increased by the year 1918 as to allow the water-rents to be again reduced. These calculations have been tested by Messrs. Howard Smith & Co., the accountants to the department, and—allowing, of course, for unforeseen contingencies—may be assumed to be well founded. These, then, are the main features of a project which is the greatest that Birmingham has yet undertaken—one of the greatest undertaken by any municipality in the three kingdoms. That it will be entered upon with a light heart we cannot say, but we do say that it is not so much justified as compelled by necessity. Whatever the cost, we must have an adequate and unfailing supply of pure and wholesome water, for without it we cannot live or have our being, whether as individual consumers or as members of a great commercial and industrial community.

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REGISTRATION OF PLUMBERS.

A LARGE and influential meeting of the Master Plumbers' Association of Glasgow and suburbs was held in the Waterloo Rooms, Glasgow, recently, Mr. William Rattray, the president, in the chair, to consider the present position of the Association in regard to registration. The Chairman explained the objects of the movement and its present position, showing how largely it had spread by the powerful aid of the Worshipful Company of Plumbers, London, since its first inception at the International Health Exhibition in London in 1884. A long and interesting debate *pro* and *con* succeeded, in which Messrs. Campbell, Caldwell, Calderwood, Alex. Brown, W. P. Buchan, D. Fulton, Symington, Day, Arnott and W. Anderson took part. On the motion of Mr. Costello, seconded by Mr. McPheat, it was carried unanimously—"That this Association approves highly of the National Registration of Plumbers, and does all in its power to support the movement." The master plumbers of Glasgow were represented at the original Plumbers' Congress in London in 1884, and a number of the chief masters joined the registration movement directly it was set on foot. The majority of the qualified master plumbers of Glasgow and the district have since become registered, but hitherto the Master Plumbers' Association as a body has not officially declared its opinion in favour of registration, so the recent resolution of the Association is deserving of notice.

The work of the session's plumbers' class, Glasgow, commenced with distributing the prizes given through the Plumbers' District Council and the prizes and certificates of the City and Guilds Institute for the work of last session. Mr. Thomas Russell, chairman of the governors of the college, presided. Dr. Henry Dyer and Mr. Ebenezer Kemp, two of the governors, also attended. The District Council was represented by Professor Jamieson; Messrs. David Thomson, architect; A. M. Scott, writer; Buchan, Rattray, Speirs, Stevenson, master plumbers; and M'Culloch, operative plumber. There were also present:—Mr. Coles, of London, the representative of the Plumbers' Company; Mr. M'Donald, master plumber, Edinburgh; and Mr. Willoughby, of the United States Department of Labour, Washington. There were upwards of 100 students in attendance. After Mr. Scott had intimated apologies for non-attendance the chairman distributed the prizes. The District Council's prizes for the Glasgow class were nine in number, and for the Greenock class seven. These prizes were in the form of books bearing directly or indirectly on the craft of the plumber. William M'Alpine, of the Greenock class, was presented with the first City and Guilds' honours grade prize in the United Kingdom, viz. a silver medal and 3*l.* in money. Robert Young, of the Glasgow class, received the third City and Guilds' prize in the ordinary grade for the United Kingdom, viz. a bronze medal and 1*l.* in money. Some fifty City and Guilds' certificates for passes were also presented. The students were addressed by the chairman, Dr. H. Dyer, and Messrs. Coles, Thomson, Rattray, M'Culloch, M'Donald, Fulton (the class lecturer) and Buchan. It was mentioned in the course of the speaking that an Ayrshire technical school for plumbers affiliated to the college was being promoted.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

16391. James Tate, for "Burning and drying bricks."

16403. John Finlay Peddie, for "Improvements in apparatus for testing sewers, drains, soil-pipes and the like."

16434. Arthur Mills, for "Improvements in padlocks."

16570. Arthur Warner, for "Improvements in springless locks or latches."

16641. Joseph Lewis, for "An improved coupling for lightning-conductors."

16645. Edmond Keith Abbott, for "Improved device for preventing windows from shaking."

16668. Malcolm McLean, for "An improved safety lock and key."

16690. Conrad Koch, for "Improvements in hinges."

16768. Herbert Hy. Green, for "Improvements in or relating to lifting latches."

16830. Conciano Canciani, for "Improvements applicable to extension ladders."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CASSELL, Patent Agents, 37 Chancery Lane, London, W.C.

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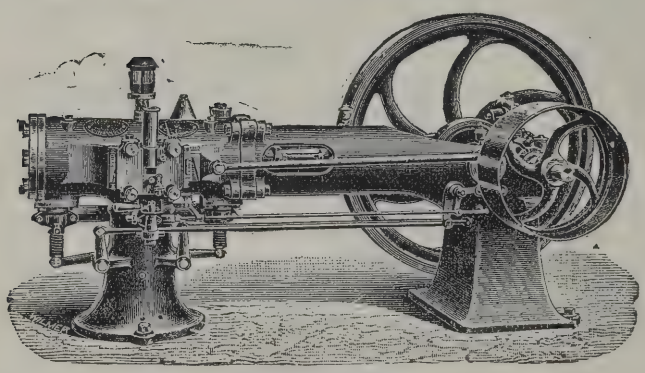
THE

"GRIFFIN" GAS ENGINE.

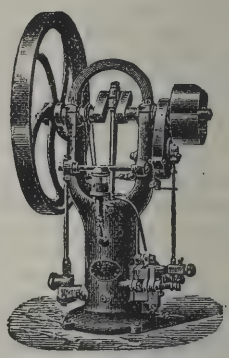
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Friday, October 16, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, OCTOBER 23, 1891.

TENDERS, ETC.

*** *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

BATH.—Oct. 31.—Designs are invited for Additions to Municipal Buildings. Mr. John Stone, Town Clerk, Guildhall, Bath.

BURTON-ON-TRENT.—Nov. 21.—Designs are invited for Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

FESTINIOG.—Oct. 31.—Plans and Estimates are invited for Electric Lighting. Mr. R. Walker Davies, Solicitor, Blaenau, Festiniog, North Wales.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

LICHFIELD.—Nov. 21.—Designs are invited for proposed Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

MERTHYR TYDFIL.—Nov. 12.—Plans are invited for School Buildings. Mr. E. Stephens, School Board Offices, Merthyr Tydfil.

CONTRACTS OPEN.

BLACKPOOL.—For Erection of Four-storeyed Buildings surrounding the Tower. Messrs. Maxwell & Wood, Architects, 29 Princess Street, Manchester.

BLACKPOOL.—Oct. 30.—For Building Four Houses, for the Claremont Park Company. Messrs. Garlick & Sykes, Architects, 12 Church Street, Blackpool.

BLACKPOOL.—Oct. 24.—For Extension of Open Market. Mr. J. Wolstenholme, Borough Engineer, Town Hall, Blackpool.

BRADFORD.—Oct. 29.—For Rebuilding Exchange Mills. Mr. T. C. Hope, Architect, 27 Kirkgate, Bradford.

BROMLEY.—Oct. 28.—For Alterations, Additions and Repairs to Vestry Hall. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

CARDIFF.—Nov. 2.—For Building Lodge, Preswylfa. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CARDIFF.—Nov. 11.—For Building Assembly Rooms, Shops and Premises. Mr. E. A. Lansdowne, Architect, 26 High Street, Newport, Mon.

CATFORD.—Oct. 26.—For Building Ten Houses, Doggett Road. Messrs. F. & W. Stocker, Surveyors, 90 and 91 Queen Street, E.C.

CINDERFORD.—Nov. 7.—For Building Wesleyan Sunday School and Classrooms. Mr. John Wills, Architect, Derby.

CLUN.—Oct. 24.—For Construction of Lych Gate, Walls and Railings. Mr. John G. Buchanan, Clerk to the Burial Board, Clun, Shropshire.

CONWAY.—Oct. 31.—For Levelling, Metalling and Making-up Roads. Mr. Wm. Menzies, Surbiton House, Englefield Green, near Egham.

DOWNPATRICK.—Oct. 31.—For Constructing Waterworks. Mr. J. W. Montgomery, Union Offices, Downpatrick.

EDMONTON.—Oct. 27.—For Building Porter's Lodge and Waiting-room. Mr. W. S. Cross, Architect, 18 Outer Temple, Strand, W.C.

EXETER.—Oct. 26.—For Building House. Mr. James Crocker, Architect, Exeter.

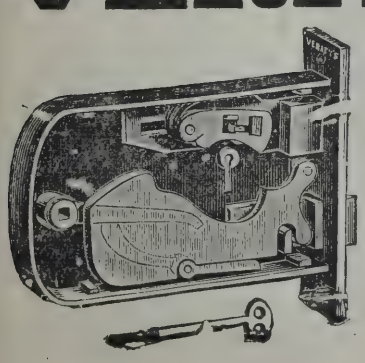
FARSLEY.—Oct. 27.—For Erection of Office Buildings and Willey House, and Extension of Shed at Cape Mills. Mr. C. S. Nelson, Architect, 10 Park Row, Leeds.

GLASGOW.—Oct. 26.—For Construction of Boat-shed. Mr. T. R. Mackenzie, Secretary, Clyde Navigation Chambers, 16 Robertson Street, Glasgow.

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GORSEINON.—Nov. 2.—For Building Board School. Mr. D. Isaac, 7 Rutland Street, Swansea.

GUILSBOROUGH.—Nov. 3.—For Construction of Filter Beds, Coton Mill. Mr. John Eunson, Engineer, Nottingham.

HALIFAX.—Oct. 29.—For First Portion of Scheme in Building Arcades and Shops to Old Market and Russell Street. Messrs. Leeming & Leeming, Architects, Victoria House, 117 Victoria Street, Westminster.

HALIFAX.—Nov. 6.—For Building Shop Premises. Messrs. George Buckley & Son, Architects, Tower Chambers, Halifax.

HAMMERSMITH.—Oct. 26.—For Building Four Houses. Messrs. F. & W. Stocker, Surveyors, 90 and 91 Queen Street, E.C.

HOVE.—Oct. 26.—For Electric Lighting. Mr. Charles A. Woolley, Town Clerk, Town Hall, Hove.

HUDDERSFIELD.—Oct. 29.—For Building Two Dwelling-houses. Mr. J. Berry, Architect, 9 Queen Street, Huddersfield.

HUDDERSFIELD.—For Engines and Sludge Pressing Machinery. Mr. H. S. Dugdale, Borough Surveyor, 1 Peel Street, Huddersfield.

HUDDERSFIELD.—Nov. 2.—For Building Shop and Four Dwelling-houses. Mr. J. Berry, Architect, 9 Queen Street, Huddersfield.

KEELBY.—Oct. 29.—For Building Parish Room. Mr. Herbert C. Scaping, Architect, Victoria Chambers, Grimsby.

KIDDERMINSTER.—Oct. 26.—For Boundary Wall and Wrought-iron Fencing and Gates at Workhouse Premises, Blakebrook. Mr. J. T. Meredith, Architect, Bank Buildings, Kidderminster.

LLANDUDNO.—For Building Theatre, Pier Head. Mr. Samuel Hughes, Secretary, Pier Offices, Llandudno.

MALVERN.—Nov. 2.—For Constructing Waterworks. Mr. John E. Palmer, Surveyor, Local Board Offices, Great Malvern.

MORTHOE.—Oct. 31.—For Building Four Cottages. Mr. Arnold Thorne, Architect, Cross Street, Barnstaple.

NEW TREDEGAR.—Oct. 31.—For Building Infants' School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

OLDHAM.—Oct. 27.—For Building County Court and Offices. Assistant Surveyor, H.M. Office of Works, General Post Office, Manchester.

NOTTINGHAM.—For Enlargement of Board School. Messrs. Evans & Jolly, Architects, Wheelergate, Nottingham.

PEEL.—Nov. 6.—For Building Court House. Mr. H. Story, Government Offices, Douglas, Isle of Man.

PENRYN.—For Building Mission Church, Mylor Bridge. Mr. H. C. Rogers, Architect, 7 Carteret Street, Westminster, S.W.

ROCHESTER.—Oct. 26.—For Classrooms, Offices, &c., to Grammar School. Mr. J. W. Nash, Architect, Medway Terrace, Rochester.

ROTHERHAM.—Oct. 27.—For Building Police Station. The Borough Surveyor.

RUGELEY.—Oct. 27.—For Building Infants' School. Mr. John Greensill, Architect, Great Wyrley, Walsall.

SLAITHWAITE.—Oct. 26.—For Building Local Board Offices. The Clerk to the Local Board, Slaithwaite.

SOUTH SHIELDS.—For Alterations to Neville Hotel. Mr. B. F. Simpson, Architect, 12 Grey Street, Newcastle-on-Tyne.

TOTNES.—Oct. 29.—For Adapting Grammar School for Police Station. The Superintendent of Police, Totnes.

TREWALCHMAI.—Oct. 28.—For Building Police Station. Mr. J. Lloyd Griffith, Clerk of the Peace, Stanley House, Holyhead.

UPPER EDMONTON.—Oct. 27.—For Building Porter's Lodge and Waiting-Room at Union School. Mr. W. S. Cross, Architect, 18 Outer Temple, Strand, W.C.

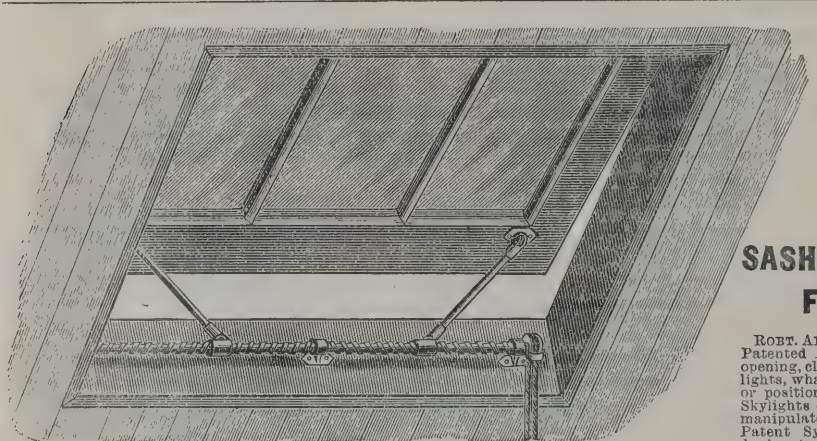
WEST BROMWICH.—Oct. 28.—For Building Board Schools for 1,110 Children. Mr. Alfred Long, Architect, 319 High Street, West Bromwich.

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J. Henry, Belfast	3,600 0 0
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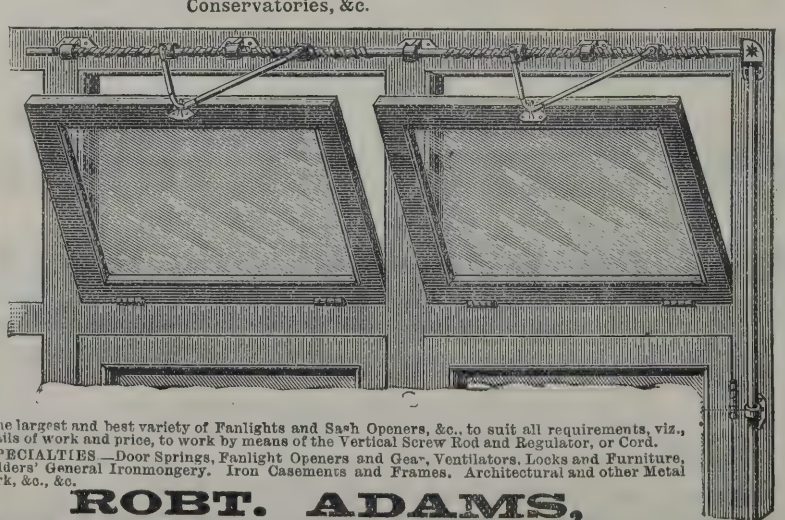


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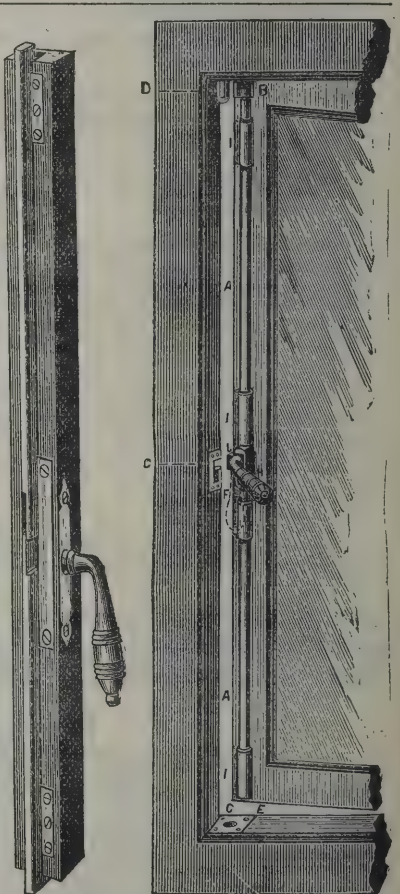




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BELFAST—*continued.*

For Building Church, Duncairn Gardens, Belfast. Mr. H. Seaver, Architect, 128 Royal Avenue, Belfast.

H. & S. Martin, Limited, Belfast	£2,926 0 0
Dixon & Campbell, Belfast	2,830 0 0
H. Laventy & Sons, Belfast	2,820 0 0
J. Lester, Belfast	2,800 0 0
J. Lowry & Co., Belfast	2,775 0 0
W. McCammond & Sons, Belfast	2,754 0 0
Campbell & Lowry, Belfast	2,751 10 8
M. Hearst, Belfast	2,700 0 0
J. Kidd, Belfast	2,700 0 0
I. Hewitt, Belfast	2,650 0 0
R. Corry, Belfast	2,620 0 0
T. McMillan, Belfast (*accepted*)	2,425 0 0

CORK.

For Building the Gibbings' Memorial Ward, &c., North Infirmary, Cork. Mr. Arthur Hill, B.E., F.R.I.B.A., Architect.

D. O'Callaghan	£13,030 0 0
S. Hill	12,677 0 0
J. McDonnell	12,649 0 0
E. & P. O'Flynn (*accepted*)	12,324 0 0

LONDON.

For Alterations to the Two Brewers, High Street, Vauxhall, for the New London Brewery Co., Limited. Mr. W. M. Brutton, Architect, 171 Queen Victoria Street.

Romaine & Co.	£476 0 0
Gregory & Co.	419 0 0
Edwards & Medway	410 0 0
G. W. Ford	392 0 0
G. S. Archer	390 0 0

For Alterations to the Red Lion, Duke Street, Manchester Square, for Mr. M. L. Carpenter. Mr. W. M. Brutton, Architect, 171 Queen Victoria Street.

G. S. Archer	£330 0 0
H. Ashwell	305 0 0
G. W. Ford	295 0 0
Edwards & Medway	292 0 0
Romaine & Co. (*accepted*)	276 0 0

LONDON—*continued.*

For Pulling-down and Rebuilding the Abbey Tavern, Kentish Town Road, for Mr. W. Cowling. Mr. J. T. Alexander, Architect.

Woodrow	£6,320 10 0
Mattock Bros.	6,255 0 0
Patman & Fotheringham	6,155 0 0
Rowe Bros.	5,980 0 0
Walker Bros.	5,970 0 0
Gould & Brand	5,831 0 0
Harris & Fagg	5,769 0 0
Edwards & Medway	5,644 0 0
S. R. Lamble	5,557 0 0

For Erection of Pantechnicon Warehouse and Stables, Market Road, Caledonian Road, for Mr. John Southern. Mr. R. Owen Allsop, Architect. Quantities supplied.

	Whole Building.	Without First-floor Stables.
E. J. Chant	£1,675 0 0	£1,132 0 0
N. Lidstone	1,610 0 0	1,201 0 0
Gould & Brand	1,596 0 0	1,149 0 0
Royal & Co.	1,585 0 0	1,093 0 0
Mattock Bros.	1,533 0 0	1,161 0 0
G. H. & A. Bywaters	1,494 0 0*	1,043 0 0

* Accepted.

For Pulling-down and Rebuilding No. 62 Farringdon Street, for Mrs. Homewood. Messrs. Romaine-Walker & Tanner, Architects. Quantities supplied by Messrs. Pryce-Cuxson & Leigh.

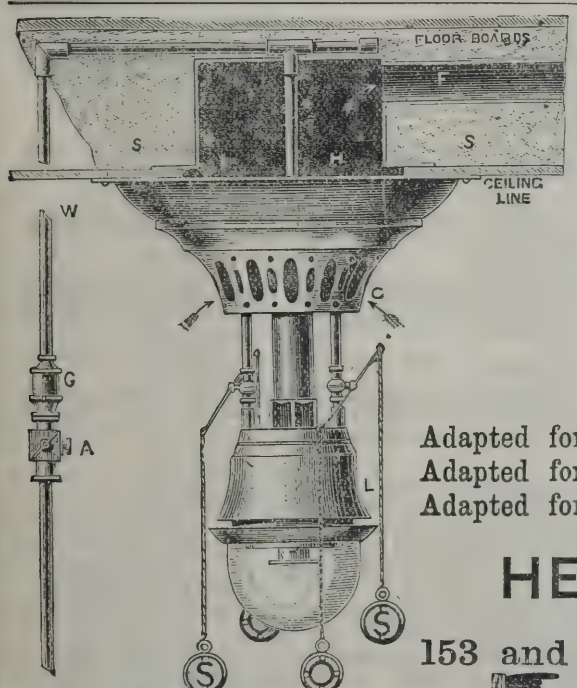
	Main Building.	Half-Party Wall.	Beech Shop Front.	Mahogany Shop Front.
Balaam Bros.	£1,600	£54	£41	£50
Holloway Bros.	1,550	54	24	38
Scrivener & Co.	1,504	51	38	48
B. E. Nightingale	1,493	54	35	47
Burman & Sons (*accepted*)	1,430	56	32	36

For Rebuilding No. 127 Lower Marsh, for Mr. Crane. Mr. W. M. Brutton, Architect, 171 Queen Victoria Street.

R. C. Scutt (*accepted*)	£700 0 0

For Repairs, &c., to Nos. 79 and 80 Milton Street. Mr. Herbert Knight, Architect, 129 Cheapside.

F. Prater (*accepted*)	£177 0 0



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Most "INTENSE WHITE," Brilliant Gaslight.
Most Economical, Simple, Durable.
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Burner, being a circular slit, does not choke up.
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Grey Stone and White Flare Lime. Great Culand Cliff Hydraulic Lime.
Gault and Clamp Burnt Bricks, Cornice Tiles and Tubes, Pether's Patent Diaper, Bricks, &c.

LONDON—*continued.*

For Building Municipal Lodging-house, Parker Street, Drury Lane.

J. Frampton	£18,500 0 0
P. S. Robertson	16,953 0 0
E. Lawrance & Sons	16,597 0 0
F. & H. F. Higgs	16,575 0 0
Holliday & Greenwood	16,375 0 0
Scharien & Co.	16,226 0 0
B. E. Nightingale	16,079 0 0
Co-operative Builders, Limited	15,722 0 0
A. Kellett	15,685 0 0
Killby & Gayford	15,674 0 0
Patman & Fotheringham	15,589 0 0
W. Marriage	15,560 0 0
M. Gentry	15,200 0 0
J. Allen & Son	15,100 0 0
Reed, Blight & Co.	15,043 0 0
C. Wall	14,850 0 0
Perry & Co.	14,746 0 0
Holloway Bros.	14,300 0 0
J. Godfrey & Son	14,297 0 0
F. T. Chinchen	13,988 0 0

For Pulling-down and Rebuilding the Denmark Arms Public-house, Barking Road, East Ham, for Messrs. Taylor, Walker & Co. Mr. FRED A. ASHTON, Architect, Stratford.

Hearle & Farrow	£3,495 0 0
W. Watson	3,456 0 0
F. Voller	3,370 0 0
J. Morter	3,345 0 0
J. & H. Cocks	3,335 0 0
North Bros.	3,320 0 0
Coulsell Bros.	3,192 0 0
J. JOHNSTON (*accepted*)	3,039 0 0
W. Shurmur	2,997 0 0

For Alterations to the Albion, Caledonian Road, for the New London Brewery Company, Limited. Mr. W. M. BRUTTON, Architect, 171 Queen Victoria Street.

G. W. Ford	£400 0 0
Edwards & Medway	390 0 0
G. S. Archer	390 0 0
Romaine & Co.	390 0 0
J. Arnold	389 0 0

LONDON—*continued.*

For Alterations to the Three Tuns, Blackheath, for Mr. G. T. Riddall. Mr. W. M. BRUTTON, Architect, 171 Queen Victoria Street.

H. Bridle	£735 0 0
G. W. Ford	680 0 0
W. L. Simpson	635 18 0
E. J. Ford	628 0 0
J. MEAD (*accepted*)	609 0 0

NOTTINGHAM.

For Building Five Sculleries, with Bathroom over, Scullery fitted with Hot and Cold Water, for Mr. George Boultby, Nottingham.

W. White, Nottingham	£319 10 6
A. B. Clarke, Nottingham	300 0 0
E. Sharp, Nottingham	283 15 0
G. Sadler, Nottingham	276 0 0
T. Barlow, Nottingham	268 0 0
A. Andrew, Nottingham	264 0 0
J. Inger, Nottingham	262 0 0
J. Cooper, Nottingham	241 6 6
W. SAVAGE, Nottingham (*accepted*)	250 0 0

PENZANCE.

For Additions, &c., to Leskinnick House, Penzance.

Ford, Penzance	£478 0 0
R. Hill, Penzance	450 0 0
POOLEY, Penzance *	439 5 0
A. Trythall, mason and plumberwork, Penzance	304 10 0
I. James, carpenter and plumber, Penzance	275 0 0

* Accepted at 400*l.*

READING.

For Alterations and Additions to Borough Police Station, Reading. Mr. ARTHUR E. COLLINS, Assoc.M.Inst.C.E., Borough Engineer and Surveyor, Reading.

Goodchild, Reading	£666 0 0
Taylor, Reading	638 10 0
Wernham, Reading	598 10 0
G. S. Lewis, Reading	565 0 0
Pilgrim, Reading	543 15 0
Searle, Reading *	516 0 0
Borough Engineer's estimate	530 0 0

* Recommended for acceptance.

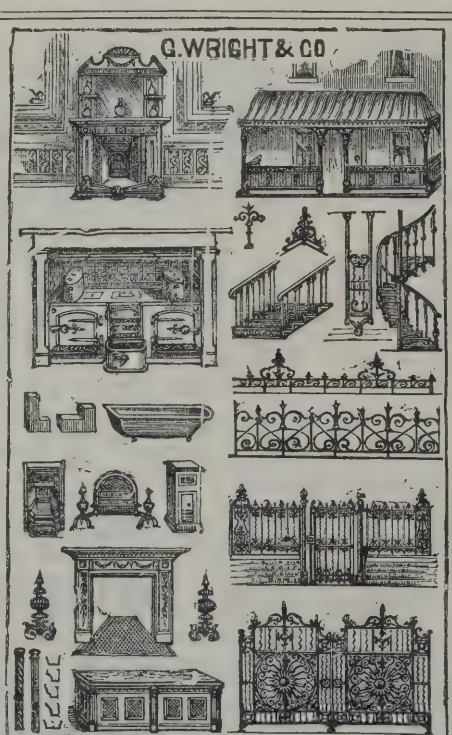
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"THE GOLD MEDAL RANGE"
With Lifting Fire.
WORKS, ROTHERHAM. Estab. 1854.

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NEW COCKBURN QUICK-BREAK
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With Adjustable and Rubbing Contacts.
ALSO COCKBURN
PATENT FUSES & CUT-OUTS
The most accurate and reliable made, whereby all risk of Fire is eliminated.

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Woolwich Arsenal
General Post Office
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Garrick Theatre
St. James's Hall
The Moore & Burgess Minstrels
The Tivoli Theatre
Junior United and other Clubs
The Langham Hotel
Hotel Windsor, and others
The Café Monico
Baron de Rothschild's
Sir David Salomons
The Security Co.
Messrs. J. & P. Coats, Limited, Paisley &c.

MAIN & BRANCH SWITCH BOARDS.
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NEW TWISTED STRIP AMMETERS AND VOLTMETERS.
Ceiling Roses, Lampholders, Glass Shades Flexible and other Wire, and all Electric Accessories in Stock.
PRICE LISTS ON APPLICATION.
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Telephone No. 7629.

PLUMSTEAD.

For Alterations and Repairs to Shops, Nos. 15 and 16 Plumstead Road. Mr. HENRY H. CHURCH, Architect, Woolwich.

Hutton	£478 0 0
How	263 0 0
Coombs	256 0 0

SALISBURY.

For Building Cottage near to the Entrance to Bugmore Meadows, for the Salisbury Urban Sanitary Authority. Mr. J. C. BOTHAMS, City Surveyor.

Webb & Co., Salisbury	£383 0 0
Williams, Salisbury	378 0 0
Grant, Salisbury	377 16 0
Tryhorn, Salisbury	329 10 0
Dibben, Salisbury	323 0 0
H. COOPER, Salisbury (*accepted*)	294 10 0

SCARBOROUGH.

For Works in connection with Widening Cloughton Bridge, near Scarborough. Mr. W. STEAD, County Surveyor, Northallerton, North Riding.

T. Retch, Scarborough	£150 0 0
W. BLACKBURN, York (*accepted*)	103 15 10

WOOLWICH.

For Erection of Three Shops in Wellington Street, for Messrs. Lloyd & Son. Mr. HENRY H. CHURCH, Architect, Woolwich. Quantities by Mr. William Henry Strudwick.

Coombs	£3,258 0 0
Allen & Sons	2,950 0 0
Multon & Wallis	2,840 0 0
Hart	2,649 0 0
Battley	2,589 0 0
Holloway	2,587 0 0
Wallis & Sons	2,544 0 0
CHAPMAN (*accepted*)	2,495 0 0

TRADE NOTES.

ON November 2, Mr. Gilbert Dalziel will publish from *Judy* office "The Round Table Annual" for 1892, being a series of stories written by A. Dewar Willock, and entitled "Taradiddles." The book is fully illustrated by W. F. Thomas.

A THREE-LIGHT window has been fixed in the south chapel of the new church, Fenton, Stoke-on-Trent, by the Turner family; the subject, "Our Lord as the Great Physician" in the centre light, and the "Sick coming for Healing" in the side-lights. The figures are placed under canopies of fourteenth-century treatment, and in the tracery angels bear the text, "The leaves of the tree were for the healing of the nations." The window was executed from the design of Mr. T. W. Cannon, at his studio, High Street, Smethwick, near Birmingham.

MR. JOHN GRUNDY, of 30 Duncan Terrace, City Road, London, is now supplying his patent warm-air ventilating fire-grates to the Leicester Asylum.

AN ornate oak lectern has just been presented to Brooking Church, Totnes. It was designed by Mr. Edmund Sedding, of Plymouth, and executed by Messrs. Rashleigh, Pinwell & Co., of the same town.

SHORLAND'S patent warm air ventilating Manchester grates are being used in the new workhouse, Abergavenny. They are supplied by Mr. E. H. Shorland, of Manchester.

THE "Tenor" bell, about 9 cwt., at Pedmore Church, near Hagley, has just been rehung by Messrs. Charles Carr & Co., who also have secured the contract to rehang and quarter the peal of six bells at Cookley Church, near Kidderminster.

A LARGE clock has been erected in the tower of the parish church, Sawston, near Cambridge, which will supply a long-felt want, and no doubt be highly appreciated by the village and the district around for many miles. The clock has been made throughout by the well-known firm of Messrs. Potts & Sons, at their clock factory, Guildford Street, Leeds. The clock at Sawston shows the time on two external dials, 5 feet diameter, bolted into the walls of the tower; the hands, figures and minutes are gilded, and the background, painted black, makes the time to be distinctly seen at a distance. The clock also strikes the hours upon the large new tenor bell and the Cambridge or Westminster musical four quarters upon four others of the new peal. The clock is well made on the best principles from the designs of Lord Grimthorpe (Sir E. Beckett, Bart, Q.C.), the great authority on clocks, and has his gravity escapement, compensated pendulum and many other of his inventions and improvements, which will, with ordinary care and attention, enable it to be a first-class timekeeper.

THE *Birmingham Post* says:—The Moxley Ironworks, which were carried on for many years by Messrs. T. & C. Wells, but which have been standing for some time since the

Head Office & Works:—
POWNALL ROAD,
DALSTON.

Telephone No. 1140.

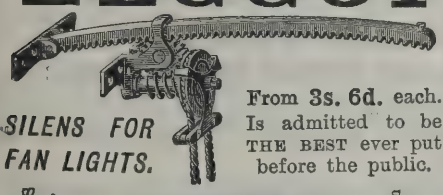
ELECTRIC LIGHTING.
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Glasgow Branch:—
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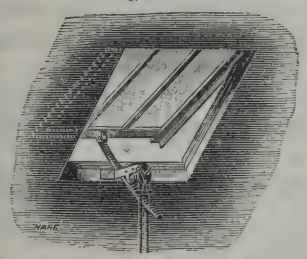
PATERSON & COOPER beg to give notice that they have Opened West End Offices and Showrooms at the above address.
ESTIMATES FOR ELECTRIC LIGHTING OR OTHER ELECTRIC WORK FREE OF CHARGE.

MANUFACTURERS TO H.M. GOVERNMENT.
GREAT REDUCTION IN PRICE LIST OF
LEGGOTT'S ADJUSTMENT



SILENS FOR FAN LIGHTS.

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These SKYLIGHT OPENERS are unsurpassed, from 4/9 each.

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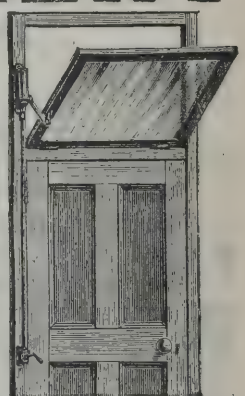
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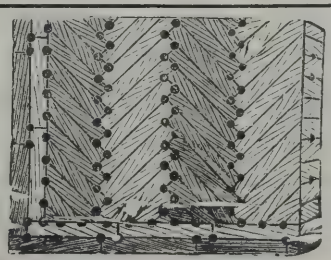
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WOOD BLOCK FLOORS.
Patent Disc-Key System.
Complete Estimates sent upon receipt of Particulars and Plan.

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PARQUET FLOORS.
Materials Supplied or Laid Complete.
Price Lists and Samples on application.

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demise of those gentlemen, have been taken by Mr. William Nock, and will be restarted in a short time.

THE tender of Messrs. R. Neill & Son, Manchester, has been accepted by the directors of the Blackpool Tower Co., for the massive concrete foundations for the tower. The work will be proceeded with immediately, and the contracts for the steel superstructure, 500 feet high, will be placed shortly.

THE laying of the new marble pavement in Peterborough Cathedral has been commenced. The cost, 2,000*l.*, will be defrayed by Dean Argles. It is intended to erect a reredos, which will be brought forward so as to restore the arrangement as it existed in the old Benedictine choir.

"WATCHES, Clocks, Jewellery and Plate" is the title of a pamphlet just published by Mr. Benson, which contains over 200 pages of illustrations, &c. It is by far the largest and most complete work of its kind issued. It will be sent post free to any part of the world by Mr. J. W. Benson, of the steam factory, 62 and 64 Ludgate Hill, E.C., or from his West-End house, 25 Old Bond Street, London, W.

THE ventilation of New Cook Street Church, Belfast, is being carried out by Messrs. Baird, Thompson & Co., ventilating engineers, London and Glasgow, who have introduced their latest improved self-acting exhaust roof-ventilators for the extraction of the vitiated air, and their improved "Panel" air-inlet wall ventilators for the supply of pure fresh air without draughts.

A SHORT time ago the Queen of Holland had her palace at The Hague fitted up with English fire appliances. The Khedive of Egypt has just followed Her Majesty's example and bought a "Metropolitan" pattern steam fire-engine, with hose and accessories, from the same firm, Messrs. Merryweather & Sons, of London. This engine will always be kept ready for use in case a fire may occur in the palace. It may be mentioned that the firm mentioned built a floating steam fire-engine for Alexandria a few years ago, which has done excellent work.

FOR some time past extensive alterations have been in progress at the Newtown (Mon.) Gasworks. The effect of the improvements will be to produce a largely-increased quantity of gas at a less cost. The contract for the ironwork was let to Messrs. R. & J. Dempster, Newton Heath, Manchester; that for the retorts to Messrs. J. Drake & Sons, Halifax; and that for the brickwork to Messrs. Morris & Sons, builders, Newtown. The practical completion of the work was celebrated by a dinner given to the workmen.

AN important correspondence is proceeding between the Board of Trade and the London County Council in regard to the present unsatisfactory standard of light adopted in the Acts controlling the gas-supply of London.

IT is stated that aluminium substituted for cast-iron in the tower of the new public buildings in Philadelphia will save 400 tons in weight, and avoid the constant expense of painting.

BUILDING AND BUILDERS.

A NEW Roman Catholic church, erected from the designs of Messrs. Pugin & Pugin, has been opened at Paisley, affording accommodation for nine hundred worshippers.

THE handsome pavilion erected by the Peninsular and Oriental Steam Navigation Company from designs by Mr. T. E. Collcutt at the Naval Exhibition, was brought under the hammer at the Mart, Tokenhouse Yard. The building was purchased for 500*l.*, and it is understood that a permanent home for it will be found in the grounds of the Devonshire Park Club at Bournemouth.

A MOVEMENT is on foot for the restoration of the church of St. Mary's, Salcot. The building is in a very dilapidated and even dangerous state. Only a part of the original nave is left, the other part, with the chancel, having fallen years ago. The remaining walls are very much out of the upright. It is estimated that 1,200*l.* will be required to carry out the work.

AS a matter of precaution, a sea-wall is to be built to protect the Rhyl Pavilion. Two grand side entrances are also to be erected.

GOVERNMENT works, according to the *Leeds Mercury*, are usually carried out with a deliberation which does not ordinarily characterise private undertakings. Though the preparatory operations on the site of the new General Post Office in Leeds were commenced three or four months ago, the erection of the building has not yet been begun. The foundations have been dug and the area walls built, but for some weeks what was previously a scene of activity has presented a deserted appearance. The reason for this delay is probably only known at the office of the Board of Works. Owing, it is said, to the architect having received wrong information respecting the level of the sewer with which the drains must be connected, the concrete foundations will have to be raised a foot or two; but the necessity for this alteration was discovered several weeks since,

Awards—Gold Medal, Saltaire, 1887; Silver Medal, Brussels, 1888; Silver Medal, Paris, 1889; Gold Medal, Brighton, 1889.

PORTLAND CEMENT (REGISTERED) SKELSEY'S ADAMANT (TRADE MARK) HULL

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SKELSEY'S
"ADAMANT" PORTLAND CEMENT.

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CONTRACTOR TO THE MANCHESTER SHIP CANAL.
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BRITANNIA TIN AND COPPER WORKS.
TO ARCHITECTS AND BUILDERS.

Fountain Street, Bury, and Shiffnall Street, Bolton:
February 13, 1891.

Gentlemen,—We have pleasure in announcing that we have opened extensive Show Rooms at 117 QUEEN VICTORIA STREET, LONDON (opposite Civil Service Stores).

We have been very successful in Lighting and Ventilating Public Buildings in all parts of the Country.

We have a large stock of Sunlights, Turrets, Exhaust Roof Outlets, Tobin's Tubes, Air Grids, &c., &c., at our Show Rooms.

We feel confident that our DESIGNS, as well as our system of Lighting and Ventilating will commend themselves to all who are interested in having BRILLIANTLY LIGHTED and WELL-VENTILATED ROOMS.

A visit to our Show Rooms will be esteemed a favour. If inconvenient to call, send for one of our illustrated Catalogues, inspect our Designs, and read our Testimonials.

Trusting to receive your favours, which shall have our prompt attention,
We remain, Gentlemen, yours obediently, J. H. PICKUP & CO.

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LONDON AND GENERAL WATER PURIFYING COMPANY'S, LIMITED,

House Cistern, fitted with a Cistern Filter.



PATENT CISTERN FILTERS, Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. *Vide* Professor Frankland's Reports to the Registrar-General, July 1866; November 1867; and May 1870. The *Lancet*, January 12, 1867.
Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.
Price, £1 10s. and upwards. Portable Filters on this System, £1 5s. to £3.
Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Bagshot Park, by H.R.H. the Duke of Cambridge, the *élite* of the Medical Profession, and at the London, Middlesex, St. George's, St. Mary's, Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4*s.* 6*d.* and 6*s.* each. Household and Fancy Filters, from 10*s.* Water-Testing Apparatus for detecting Impurities in Water, 10*s.* 6*d.* and 21*s.* each.

Portable Cistern Filters.



157 STRAND, W.C. (Four Doors from Somerset House), LONDON.

and yet the work remains to be done. We learn, however, that the alteration in the plans, which was conceded by the Post Office authorities in deference to the representations made on behalf of the Corporation and other local bodies, has been completed, and that in all probability the structure when raised will be more in harmony with the desires then expressed than it would have been had the original design been adhered to.

At the meeting of the Stratford-on-Avon Rural Sanitary Authority plans were submitted for the proposed joint sanatorium, the estimated cost having been reduced to 5,700*l.*

The late Herr Aders, who died a little while ago in Düsseldorf, left over a million marks for the benefit of the working-classes of his native town. The responsible authorities, after due consideration, have decided how to use Herr Aders's munificent gift. It is proposed to build comfortable houses for worthy working-men and their families. The cottages are to be erected in the suburbs, and within a reasonable distance of the men's work.

The Board of Guardians for Beverley have again discussed the question of providing a new workhouse infirmary. The Local Government Board had approved of plans for a structure to cost between 3,000*l.* and 4,000*l.* A section of the Board was in favour of a smaller scheme to cost not more than 2,000*l.* A resolution was adopted that the architects should prepare an estimate of the exact sum which the larger scheme would cost.

The Dean of Guild Court, Edinburgh, have granted a warrant to the trustees of the Sick Children's Hospital to take down and remove the present hospital, and to the Edinburgh Co-operative Building Company to erect three tenements at Hollybank Terrace.

VARIETIES.

The Durban Corporation have recently formally appointed Mr. W. H. Radford, C.E., of Nottingham, consulting engineer for the new sewerage of the borough, to act in conjunction with the resident borough engineer, Mr. John Fletcher, C.E. It is proposed to lay about twenty miles of sewers at once, special care being taken to make them watertight in consequence of sandy waterlogged subsoil. The sewage will be pumped into a set of storage and screening tanks, from which it will be discharged into the Indian Ocean on the ebb tide. The sewage outfall has been selected, after careful tidal, wind and wave investigations, and it will be near the end of the "Point," at the entrance to the Durban Harbour and Bay. Powerful engines and pumps will be put down, and probably part of the power will be derived from refuse destructors. The Corporation have obtained powers to borrow 150,000*l.* for the sewerage, but the first section is estimated to be completed for 70,000*l.* Durban is the chief Natal port, and is a most enterprising, wealthy and rapidly increasing town; and, in addition to the sewerage, the above engineers are associated with extensive additions to the waterworks, now approaching completion, and also with additions to the tramway system.

At the meeting of the Leeds County Council a letter was read containing a copy of the following resolution, passed by the Pious Use Committee:—A letter from the Mayor of Leeds to the vicar, as chairman of this committee, having been read, it was resolved that this committee, understanding that the Corporation have an opportunity of acquiring the Quebec estate, contribute the sum of 2,000*l.* towards the expense of making the site an open space with as little delay as possible, and that if this offer be accepted this committee at once take steps to procure the necessary legal authority to carry it out. The Council have decided to offer 33,000*l.* for the estate, towards the purchase of which the Midland Railway Company contribute 3,000*l.*

Two thousand five hundred pounds have been subscribed towards building a vicarage at Scunthorpe, Lincolnshire.

A proposal by the Corporate Property Committee of the Leeds County Council to expend 2,812*l.* in improving the sanitary arrangements of the Town Hall, according to the Borough Engineer's plans, has been referred back to the committee, a number of the members objecting to the placing of pipes outside the building, as was suggested.

It has been decided to enlarge the harbours of Candia, Rethymo and Canea, in the island of Crete. Specifications, &c., and particulars of the work to be had on application to the Governor-General of the Island.

The Main Drainage Committee of the London County Council have recommended the reconstruction of 2,000 feet of the Limekiln Dock sewer, and that plans and specifications should be got out and tenders invited. Also the acceptance of the tender of Messrs. Spurr, Inman & Co. to supply two high-pressure steel Lancashire boilers for Crossness station at 460*l.* per boiler.

The representative committee appointed by the Liverpool City Council to consider the details connected with the starting

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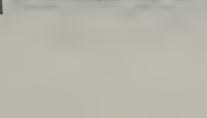
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of a nautical school at Liverpool have decided to recommend that such a school be founded. It is stated that about 1,000*l.* is required to fit up a building for the purposes of the school, and that the annual cost of the institution will not exceed 2,500*l.*

AT the meeting of the Idle Local Board a letter was read from the Local Government Board stating that shortly they would hold an inquiry into an application made for sanction to the expenditure of 25,000*l.* on sewerage works.

A REPORT has been submitted to the Aberdeen Town Council by a committee as to the propriety of providing for increased storage and additional filter-beds at Invercannie in connection with the Corporation waterworks. The construction is recommended of an additional storage or settling reservoir at Invercannie, capable of holding about 35,000,000 gallons, with six new filter-beds. The cost of the land and works is estimated at 67,000*l.*, which includes the site for a second storage reservoir. The committee has been empowered to consult a professional engineer on the whole question of the water-supply for the city, also to institute proceedings for preventing the contamination of the Dee by the discharge of sewage at certain villages.

THE *Manchester Guardian* understands that steps will be shortly taken for carrying out the long-contemplated reflooring of the nave of Manchester Cathedral. Towards this object a considerable amount has now been subscribed. Nothing has been decided, so far, as to the material for carrying out the work, but the principal mover in the undertaking is strongly in favour of the reflooring being carried out in black and white marble.

THE construction of a tunnel under the Danube, similar to that under the Thames, is projected. It is proposed to construct it for tramways, as well as passenger and vehicular traffic.

AT the meeting of the Court of Common Council it was referred to the County Purposes Committee to consider and report on the state of the law as to lamps in common domestic use for the consumption of dangerous mineral oils, and to make suggestions thereon.

AT a meeting of ratepayers of Denny and Dunipace, a report was read from Professor Dittmar, Anderson's College, Glasgow, in which he condemned as unfit for internal use the gravitation-supply introduced into Denny a year ago at a cost of about 14,000*l.*

THE Khojak Tunnel, the *Indian Engineer* says, ranks as the eleventh longest in the world; of the other ten, six are on the continent of Europe, three in England and one in America. With the one exception of the Hoosac Tunnel in America the Khojak is far longer than any other in Asia, Africa, America or Australia.

A RAILWAY scheme for New York advocates underground railways on each side of the city and across the town underneath Union Square and Fourteenth Street; express trains running on special lines at the rate of forty miles an hour; electricity for power and lighting; the block system and the latest methods of ventilation. The proposed railways would be thirty miles in length, embracing 100 miles of single line.

THE Swansea Corporation have decided to go to Parliament for permission to spend 230,000*l.* on a new water scheme, the new source of supply being the watershed of the river Usk. Thus an estimated additional supply of 5,500,000 gallons a day would be obtained. It was also decided by the Corporation to institute an inquiry into the advisability of amalgamating the Harbour Trust with the Corporation, it being estimated that were Parliament to sanction this a saving of 10,000*l.* a year in interest alone might be effected owing to the cheaper rate at which the Corporation can borrow.

THE Leith Town Council have resolved, in view of the proposed new dock, to write the Dock Commission that it would be desirable, for the convenience of the public, to continue the promenade from Seafield right along to the East Pier, and to afford convenient access for the public either from the shore or from Constitution Street.

IN connection with the proposed scheme for lighting Inverness by electricity, Mr. Fraser and Mr. Lowe, engineers, London, have made an examination of the Caledonian Canal, accompanied by members of the Town Council. Several sites were found suitable, but the general feeling was in favour of taking the water from the Canal at a point opposite Holm Mills, where a fall of about 35 feet should be obtained. This, it is calculated, would give about 400 horse-power, and be more than ample to light the principal streets and public buildings.

MR. FELIX JOSEPH has presented to the Derby Art Gallery specimens of old Derby crown china, representing various periods of its manufacture. The gift is worth at least 3,000*l.* In recognition of his munificence the Town Council have held a special meeting, and presented Mr. Joseph with an address,

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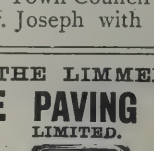
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A visit has been paid to the proposed source of a new water-supply for Shrewsbury and Chester. Mr. E. Griffith, speaking on the occasion, said he had taken them that day to the birth-place of the River Ceiriog, and, if they built an embankment 50 feet high, they could get a capacity for holding 600,000,000 gallons, and if they carried it 12 feet higher it would almost double the capacity. He put down Chester at 50,000 inhabitants and Shrewsbury at about 30,000. The distance to each of these places from Chirk is twenty-one miles, and ten miles to the reservoir. The pipes to Shrewsbury would be 11 inches and to Chester 14 inches. They would have no engineering difficulty, nor any with the landowners.

The Borough Surveyor of Southampton has, as ordered by the committee, applied to different towns for information relative to the receipts and expenditure of Turkish baths, and has received returns from ninety towns; from the information contained in them the committee were of opinion, having regard to the population of Southampton, it would be a loss to the town to establish Turkish baths. The cost would be 1,000*l.*, which would have to be paid out of revenue account, and according to estimate given by the surveyor, the working expenses would amount to 220*l.* yearly.

CHICAGO EXHIBITION NOTES.

More than 15,000,000 feet of lumber will be used in the construction of the huge building for manufactures and liberal arts.

The foreign commissioners—Sir Henry Wood and James Dredge, of England, Herr Wermuth, of Germany, and Dr. Emil Meyer, of Denmark—are greatly impressed and pleased at the building plans and extensive preparations for the exposition. Mr. Dredge says:—"I have examined the plans very carefully. They contemplate the erection of magnificent buildings. They are bold, striking and, I may say, far in advance of our anticipations. From an architectural point of view I do not believe they could be improved. And I am assured that the landscape effects will be in harmony with the architectural features. Mr. Olmstead is the greatest landscape-engineer in the world. The work he has done for the World's Fair shows that."

American jewellers are contemplating the project of massing their exhibits at the exposition, believing that a more effective showing can be made in that manner. The matter s not yet decided. Foreign jewellers are preparing to make an exhibit of unprecedented extent and value.

The Association of Civil Engineers of the City of Mexico will attend the exposition in a body.

M. O. Jaensch, of Wahoo, Neb., writes to Chief Allison offering to the exposition a valuable collection of arms. The collection includes 100 pieces, including swords, pistols, guns, &c., being a complete showing of all the different swords and firearms made from the time of the invention of gunpowder down to the Franco-Prussian war. Mr. Jaensch says the collection was left him by will. He offered it to the exposition without cost.

Lieutenant Baker, special commissioner for the World's Fair to Mexico, reports that Mr. Berringer, a prominent merchant and landholder in Tabasco, will send to the exposition a magnificent collection of the cabinet-woods of Mexico. He promises to show a specimen of every variety of cabinet-wood in the republic of Mexico.

A Turkish flag was hoisted at the World's Fair grounds on Sept. 20 with appropriate ceremonies. It was raised on the site which Robert Levy, of Constantinople, has secured for his Turkish specialties. He will reproduce a Constantinople street, show most of the striking features of Turkish life, and have a novel and interesting collection of Turkish goods and curios.

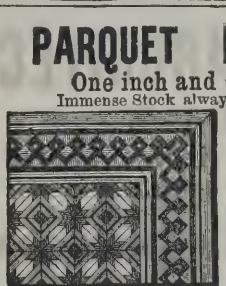
The Massachusetts building at the exposition will be modelled after the historic old Hancock House, which stood on Beacon Street, Boston, for fully 125 years. Built by his uncle in 1737, this mansion was occupied by John Hancock, the signer of the Declaration of Independence when Governor of Massachusetts, and there he entertained Washington, Lafayette and many other distinguished revolutionary patriots. Massachusetts will spend 35,000 or 40,000 dols. in imitating at the World's Fair this famed mansion. The building will be used almost exclusively as a State head-quarters and club-house.

The National Brick Manufacturers' Association has appointed a committee of five to secure an international exhibition of clayworking machinery for the World's Fair, and the committee has issued an address inviting the views of the trade.

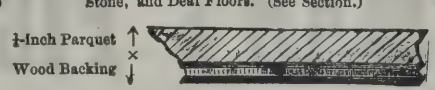
Sir Henry Wood, of the British Royal Commission, says that it is the present intention of the Commission to build at the exposition a typical old English manor, or hall, as the English head-quarters. He says also that an exact reproduction of Shakespeare's house at Stratford-on-Avon will be built if the necessary space can be secured.

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The Grounds and Buildings Committee decided to advertise for the construction of a building to accommodate four saw-mill plants. The structure will be located south of the agricultural annexe, on piles driven in what is now a natural lagoon. The building will be 130 feet by 200 feet, and will cost 25,000 dols.

Two granite columns for the Woman's Building have been contributed by Mrs. Alice Houghton, lady manager, of Washington. The columns are 15 feet high, 20 inches in diameter, and will be placed in the main entrance on the east side of the Woman's Building.

The horticultural exhibit will be on a scale never before attempted in the history of the world. Mr. Thorp, of the floriculture division, estimates that the equipment of the horticultural building, including the purchase price of plants, will be 350,000 dols. and the total expense of the display 750,000 dols.

The Brazilian Government intends to make a magnificent display at the exposition, and will invest not less than half a million dollars in carrying out the plans for its representation. It is proposed not only to erect a building in which to display the magnificent resources of Brazil, but to surround that building with practical illustrations of the methods of agriculture and industry. There will be a sugar mill in operation, a coffee quinta, at which the method of gathering and curing coffee for the market will be illustrated, and the manner in which rubber is gathered and prepared for market will be shown in a similar way. There will be also several facsimiles of native huts, with native families living as they live at home and pursuing their industries. It is proposed also to have the national band of Brazil in attendance.

Rudolph Cronau, author and scientist, of Leipzig, Germany, has tendered to the exposition his extensive collection of paintings, sketches and photographs, representing scenes in the life of Columbus and places visited by Columbus during his voyages to the new world. Dr. Cronau has spent a great part of his life in the study of early American history, and has published a work on the subject, based entirely upon his personal investigations.

Chief Ives, of the Department of Fine Arts, has written to Director-General Davis, from Paris, that he has no longer any doubt of the Fine Arts section of the Fair being a notable success. A grand art exhibit from France is assured. It has been thought by many that the only particular in which the Columbian exposition would fail to surpass the recent Paris exposition was in the fine arts exhibit. Now it appears that because of America being the most promising market for art productions, England, France and Germany will make special efforts to provide a notable exhibit in that line. While, in respect to an exhibit of the productions of the old masters, the Chicago exposition may be inferior to the late Paris show, it seems probable that it will surpass it in the exhibition of the best efforts of modern artists.

The Colorado Marble and Mining Company has offered to donate sufficient marble to erect the Colorado State building at the World's Fair. The only conditions the company makes are that its members shall be consulted with reference to the construction of the building, so that the effect and beauty of the marble can be brought out to the best advantage, and that the State pay the railroad freight on the material from Colorado to Chicago. It is claimed that in durability, tone, colour and finish the Colorado marble is equal to any that is imported from Italy.

Lord Stanley has promised to do all he can to have the Dominion of Canada make a creditable exhibit at the exposition. Many prominent Canadians are equally interested, and have promised their aid. This result is due in a large measure to the exertions of J. Allen Hornsby, of the Department of Electricity of the exposition, among the delegates to the recent National Electric Light Association at Montreal.

E. T. Jeffery, chairman of the Grounds and Buildings Committee of the exposition, made the following estimate of necessary exposition expenses for submission to the recent meeting of the National Commission:—Buildings, 7,295,000 dols.; grading and filling, 450,000 dols.; landscape, 323,490 dols.; viaducts and bridges, 125,000 dols.; piers, 70,000 dols.; waterway improvements, 225,000 dols.; water supply and sewerage, 600,000 dols.; railways, 500,000 dols.; steam plant, 800,000 dols.; electricity, 1,500,000 dols.; statuary on buildings, 100,000 dols.; vases, lamps and posts, 50,000 dols.; fuel and light during construction, 20,000 dols.; seating, 8,000 dols.; World's Congress, 200,000 dols.; improvement of lake front, 200,000 dols.; general expenses of Construction Department, 500,000 dols.; organisation and administration, 3,308,563 dols.; police, watchmen and other expenses, 1,550,000 dols. Total 17,825,453 dols.

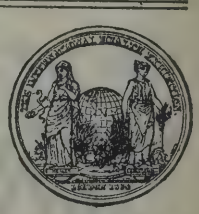
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On the first floor will be office-room for cattle and horse associations, dog and pet-stock associations, and all remaining live-stock organisations. On the second floor will be an assembly hall, 172 feet long and 74 feet wide. Here the farmers will be given a chance to hold meetings. Special rooms are provided for the Farmers' Alliance, the National Grange and similar associations. The entire structure has been so planned as to give the farmers and live-stock men generally all they could ask in the way of accommodation at the World's Fair. The building will in form resemble the letter T, one portion being 500 feet long and the other 200 feet.

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ATTENTION should always be called to a really serviceable material such as we believe the "Anthydor" Compound to be, and which will probably be most useful to many whose requirements will be better suited by using the Anthydor than any other of the excellent varieties of paints and covering compounds now in the market. The Anthydor, manufactured by the Anthydor Compound Company, Billiter Buildings, E.C., is an entirely novel substitute for oil-paints and distemper. Made in various tints the compound is intended for inside and outside work. The compound may be had washable or otherwise as ordered. It does not become discoloured as some compounds do, owing to changes resulting from the admixture of chemical agents. In many cases, especially in outside work, the washable Anthydor will be most useful as proof against weather and elements. In another form the compound can be removed without much difficulty if required. It may be as well to allude to the claims advanced by the company for the Anthydor. It is, they say, manufactured by a new process and of the best materials, and has proved to surpass in beauty, colour, covering properties and durability, all paints or distempers hitherto introduced. Another great advantage is that these compounds are absolutely lime-resisting, which, of course, is a very great feature. It is easily applied on any paper, inside and outside walls of all kinds, woodwork, iron, &c. It requires nothing added but tepid water to thin it down to the consistency of cream, and can be applied with either distemper or paint brushes, which it will not injure. It works like paint, and woodwork requires no special preparation beforehand. It is cheaper than wall-papers, dries smooth and bright, keeps its colour, and is most effective for high-class decorative work. It is claimed to be in every way much better than the ordinary distemper, which is known to be of a perishable nature and not at all conducive to health. It is a sanitary agent, is imperishable, and there is no decomposition whatever. It will keep any length of time. It is superior to all other distempers in its covering properties, as 1 cwt. will cover from 700 to 800 superficial yards. It is made for outside and inside walls and ceilings of public and private buildings, Government offices, banks, colleges, schools, warehouses, offices, railway stations, factories, workhouses, asylums, hospitals, churches, chapels, cottages, coachhouses, stables, laundries, &c. Its covering properties are much greater than oil-paint, it is more durable, damp-resisting, will keep its colour, thoroughly washable, is non-poisonous, works freely and smoothly, dries hard, does not blister or flake and will not crack with heat. It is superior to whitewash for ceilings and will cover paint and paper, and when varnished is more durable than oil-paint.

SANITATION OF ST. PETERSBURG.

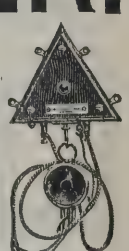
THE unsatisfactory condition of the Russian capital in more than one respect is discussed by the British Consul there in his last report. Mr. Michell says that, according to the census taken in December 1890, the population, exclusive of the suburbs, numbered 956,226, being an increase of 31,760 as compared with 1889, and of 22,443 as compared with 1888. The rate of mortality is still abnormally high, owing chiefly to insanitary conditions. There is a total absence of sewers, their place being mainly taken by primitive cesspools and to some extent by rain-water drains, and the death-rate during the past five years has varied between 26·2 and 29·6 per 1,000. At the request of the Municipality, Mr. Lindley, C.E., drew up a plan of sewers for the whole town in 1880. It still remains under consideration. In addition to the sanitary disadvantages, St. Petersburg is frequently exposed to the danger of inundation during a prevalence of strong winds blowing from the west, south and north-west. Hardly an autumn passes without some of the low-lying suburbs being submerged to the depth of several feet, exposing the poorer classes of inhabitants, who occupy these parts of the town, to considerable danger, suffering and material losses. To prevent these it has been proposed to build a sea-wall from Oranienbaum, on the southern side of the gulf, to Lissy Noss, on the northern, leaving open the

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present southern channel at Cronstadt. Such a wall would, it is said, by preventing a flow of water during westerly and south-westerly gales in the direction of the mouth of the Neva, effectually preserve St. Petersburg from being buried under the waters of the Gulf of Finland and partly those of the Baltic. The existence and imminence of the danger are exemplified by previous inundations, especially that which took place in 1824, when the water rose 13½ feet above its ordinary level. In 1691 the overflow is stated to have been still more serious, the water attaining a height of more than 15½ feet. During the past year there were two successive inundations in August, which at one time threatened to prove very calamitous. When the overflow had reached the height of 10 feet above the usual water-level the wind luckily subsided, and the water shortly regained its normal height. There is no indication at present of any intention to carry out the sea-wall referred to, the resources of the Government being already too heavily taxed for other and more pressing requirements.

RUSSIAN CHURCHES.

IT is the opinion of Professor Meiklejohn that influenza in Russia originates in the churches :—

I have just returned from Russia (he writes), and I think I can throw some light on the origin of the plague which has visited us during the last two years, and which wrought such havoc in the House of Commons. I believe I can also make a suggestion towards diminishing its ravages in this country. The most frequented buildings in Russia are the churches and cathedrals, and they are frequented by crowds of the poorest classes. They are "open" from morning till night; but this being "open" is strictly limited by the two or three doors which separate the porch from the main body of the building. The windows, too, are closed; they cannot be opened, and it is doubtful if a cubic foot of fresh air succeeds in making its way inside in the course of twenty-four hours. Just inside the doors the floor of the church is beset by a number of beggars infected with various kinds of loathsome disease. The air of these cathedrals is effete, dead, clay-cold, and especially in the corners and side-chapels. The air, such as it is, has been breathed over and over again thousands of times by the dirtiest and most depressed people in Europe, and hence it forms the appropriate *nidus* for the germs of such diseases as attack the mucous membrane and the breathing apparatus. A poison of the intensest virulence is brewed and rebrewed by the inhalations and exhalations of these miserable people. The *bis decies* distilled result is imported into this country by the steamers that carry the trade of the Baltic. You will remember that Hull was the first place attacked and that Parliamentary witnesses from Hull imported the disease into the House of Commons. Brewed in Russia, conveyed in Baltic ships, imported into Hull, distributed in the House of Commons—that is the short story of the Russian influenza.

Now the Houses of Parliament, considered as a whole, are not much better ventilated than the cathedrals of Russia. There are at present no means of sending a wave of fresh air through the various rooms in the building so as to clear out the poisonous germs that lurk in the numerous corners which are provided by its architectural structure. If a great sweep of fresh air could be driven through each room every morning, the dead atmosphere in which disease-germs grow and multiply would be expelled and the rooms would be tolerably healthy for the rest of the day. I have frequently observed the presence of dead air even in the lobby of the House of Commons, and, till this is remedied, there will always be a danger of the return of the influenza and other depressing diseases.

THE MANCHESTER SHIP CANAL.

A MEETING of the North-Western Branch of the Society of Medical Officers of Health has been held in Manchester, when a paper was read by Dr. Kenyon, Chester, entitled "Some Sanitary Notes on the Ship Canal." He said that the rapid concourse of such a large body of men as had been brought together for the construction of the gigantic work of the Ship Canal, and their residence for several years in temporary dwellings, afforded some material for the study of health problems. At any rate, it was worth while to put on record the experience, which was on the whole of a highly satisfactory nature. He would only refer to that part of the canal which was in his own district, and which included the important entrance works at Eastham and seven miles inland. The men were housed in excellent wooden huts clustered into villages. They were generally of one storey, with abundant cubic space and well lighted. Each house had several rooms, and was in charge of a married couple, who took a certain number of single men as lodgers. It was a peculiar fact, from a medical point of view, that in one of these villages, with over 100 houses,

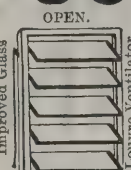
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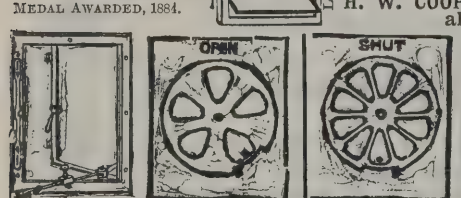
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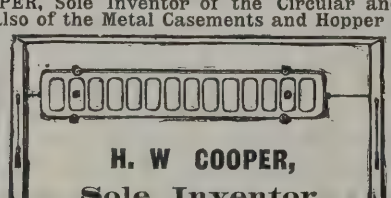
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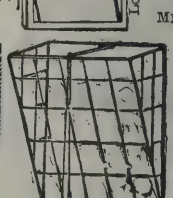
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there was for twelve months generally one hut with cases of scarlet-fever among the children, and yet the disease did not spread, although, beyond keeping the children from school, no special means of isolation were adopted, and the party walls between the huts had numerous chinks. He did not think that in any single instance did the infection find its way through the chinks so as to affect the children in the next house. There was always a fair space round the huts. At Ellesmere Port a convenient hospital was built, which proved extremely useful for cases of typhoid fever, of which, however, the number was not great. The moral was that with reasonable care, on practically new ground in the open country, it was possible to house a large but well-fed industrious population and keep them free from infectious disease. Of course the population in this case was a picked one, and everyone brought to the place as accessories—shopkeepers and the rest—was in a flourishing condition. The conditions, indeed, offered a marked contrast to those which obtained in slums. In the latter case it was not so much questions of drainage as the degraded character of the occupants of the houses which caused the high death-rate.

The Chairman said the experience on the Ship Canal was instructive. The buildings erected for the accommodation of the workmen were certainly not of a character that would be permitted in permanent structures. Nevertheless they had been inhabited for four or five years with fairly satisfactory results. No doubt the ventilation afforded by chinks and crevices gave the houses a great pull over those in stuffy courts and alleys in the large towns.

Dr. Vacher remarked that the results seemed to show that it was unwise to dogmatise on statistics gathered from small areas.

A vote of thanks was given to Dr. Kenyon for his paper.

ST. CLAIR TUNNEL.

In recording the opening of this tunnel the Philadelphia *Railway World* says :—This triumph of modern engineering has been achieved under the swift outlet of Lake Huron to supersede the ferry system of transporting the traffic of the Grand Trunk route from the American to the Canadian banks. Long ago the clumsiness of the ferries and particularly the exasperating delays in winter on account of ice-floes, made apparent the necessity for some surer and more expeditious means of interriparian transportation. A tunnel was considered least objectionable because the immense vessel interests were stoutly opposed to a bridge, on the ground that it would prove a hindrance and often a danger to navigation. But the nature of the sub-aqueous soil, clay and sand, made the feasibility of digging a tunnel a perplexing question. However, it was decided to make an attempt at constructing one. Two huge shields were started toward each other, one from the American, the other from the Canadian side. They bored their way, like mammoth moles, down under the river bed, curling their slow trails as they advanced until they met about under the middle of the river. It took twelve months to eat out the passage.

Three shields were made of heavy wrought-iron, with sharp edges, 15 feet 3 inches long and 21 feet 6 inches in diameter. Each shield was pushed forward by 24 hydraulic rams, the barrel of each ram being 8 inches in diameter, with a stroke of a little more than 18 inches. Each ram exercised a force of 125 tons.

The actual tunnel itself under the river is 6,026 feet long—over a mile. It is lined throughout with solid cast-iron plates bolted together in segments. Each segment is 5 feet long, 18 inches wide and 2 inches thick, with flanges 5 inches deep. The whole lining weighs 28,000 tons. The bolts and nuts for connecting the segments together weigh 2,000,000 lbs. The permanent way through the tunnel is laid with steel rails weighing 100 lbs. to the lineal yard. The interior diameter of the tunnel is 20 feet, and ample means have been provided for thorough ventilation and for lighting it throughout, when required, with electricity.

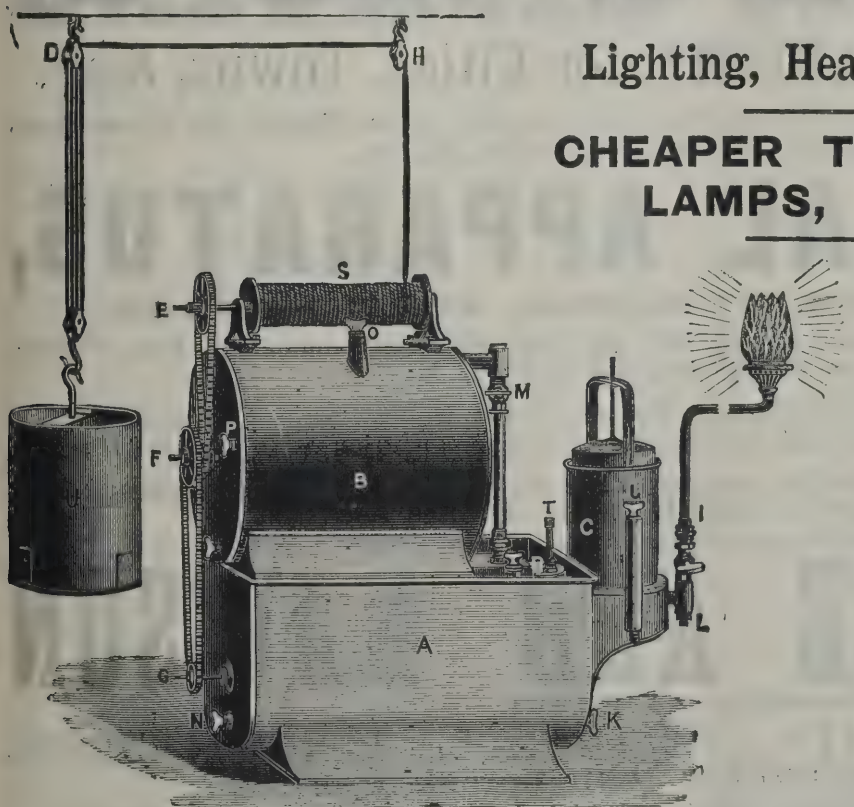
The road is practically level under the river, with approaches at each end under gradients 1 foot in 50. The total length of the tunnel end approaches is 11,553 feet—over two miles. At the ends of the approaches are junctions with the Grand Trunk Railway on the Canadian side and the Chicago and Grand Trunk Railway on the American side of the river. In connection with these junctions ample ground has been levelled and prepared, and 10 miles of shunting sidings have already been laid on each side of the river.

The cost of the tunnel proper was 1,460,000 dols. The Grand Trunk people believe that when the tunnel is in actual use it will offer facilities for through-communication between Chicago and all points east, which will be greatly appreciated by passengers in the palatial trains and freight shippers. It shortens the distance to the seaboard about 6 miles, and saves two hours in time.

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BESSEMER IRON AND STEEL.

AT the last meeting of the Iron and Steel Institute Sir Henry Bessemer described an extension of his original process by which large plates as well as bars, rails and ingots can be produced. It is advantageous at such a time to study the original description of the Bessemer process by which, as was announced, malleable iron and steel can be produced without the direct agency of fuel. The following paper by the inventor was read at the meeting of the British Association at Cheltenham in 1856:—

The manufacture of iron in this country has attained such an important position that any improvement in this branch of our national industry cannot fail to be a source of general interest, and will, I trust, be a sufficient excuse for the present brief and, I fear, imperfect paper. I may mention that for the last two years my attention has been almost exclusively directed to the manufacture of malleable iron and steel, in which, however, I had made but little progress until within the last eight or nine months. The constant pulling-down and rebuilding of furnaces and the toil of daily experiments with large charges of iron had already begun to exhaust my stock of patience; but the numerous observations I had made during this very unpromising period all tended to confirm an entirely new view of the subject which at that time forced itself upon my attention, viz. that I could produce a much more intense heat without any furnace or fuel than could be obtained by either of the modifications I had used, and consequently that I should not only avoid the injurious action of mineral fuel on the iron under operation, but that I should at the same time avoid also the expense of the fuel. Some preliminary trials were made on from 10 lbs. to 20 lbs. of iron, and, although the process was fraught with considerable difficulty, it exhibited such unmistakable signs of success as to induce me at once to put up an apparatus capable of converting about 7 cwt. of crude pig-iron into malleable iron in thirty minutes. With such masses of metal to operate on, the difficulties which beset the small laboratory experiments of 10 lbs. entirely disappeared. On this new field of inquiry I set out with the assumption that crude iron contains about 5 per cent. of carbon; that carbon cannot exist at a white heat in the presence of oxygen without uniting therewith and producing combustion; that such combustion would proceed with a rapidity dependent on the amount of surface of carbon exposed; and, lastly, that the temperature which the metal would acquire would be also dependent on the rapidity with which the oxygen and carbon were made to combine, and consequently that it was only necessary to bring the oxygen and carbon together in such a manner that a vast surface should be exposed to their mutual action in order to produce a temperature hitherto unattainable in our largest furnaces.

With a view of testing practically this theory, I constructed a cylindrical vessel of 3 feet in diameter and 5 feet in height, somewhat like an ordinary cupola furnace, the interior of which is lined with firebricks, and at about 2 inches from the bottom of it I insert five tuyere pipes, the nozzles of which are formed of well-burnt fireclay, the orifice of each tuyere being about three-eighths of an inch in diameter; they are so put into the brick lining (from the outer side) as to admit of their removal and renewal in a few minutes when they are worn out. At one side of the vessel, about half-way up from the bottom, there is a hole made for running in the crude metal, and on the opposite side there is a tap-hole stopped with loam, by means of which the iron is run out at the end of the process. In practice this converting vessel may be made of any convenient size, but I prefer that it should not hold less than one, or more than five tons, of fluid iron at each charge. The vessel should be placed so near to the discharge-hole of the blast furnace as to allow the iron to flow along a gutter into it; a small blast cylinder will be required capable of compressing air to about 8 lbs. or 10 lbs. to the square inch. A communication having been made between it and the tuyeres before named, the converting vessel will be in a condition to commence work; it will, however, on the occasion of its first being used after relining with firebricks be necessary to make a fire in the interior with a few baskets of coke, so as to dry the brickwork and heat up the vessel for the first operation, after which the fire is to be all carefully raked out at the tapping-hole which is again to be made good with loam. The vessel will then be in readiness to commence work, and may be so continued without any use of fuel until the brick lining in the course of time becomes worn away and a new lining is required. I have before mentioned that the tuyeres are situated nearly close to the bottom of the vessel; the fluid metal will therefore rise some 18 inches or 2 feet above them. It is therefore necessary, in order to prevent the metal from entering the tuyere holes, to turn on the blast before allowing the fluid crude iron to run into the vessel from the blast furnace. This having been done, and the fluid iron run in, a rapid boiling-up of the metal will be heard going

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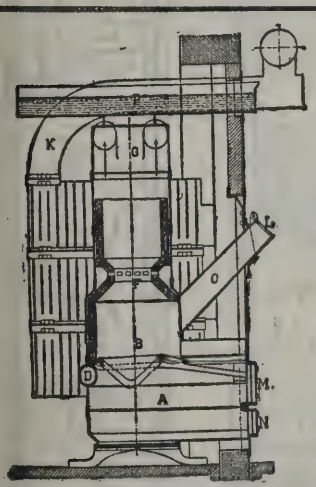
on within the vessel, the metal being tossed violently about and dashed from side to side, shaking the vessel by the force with which it moves. From the throat of the converting vessel flame will then immediately issue, accompanied by a few bright sparks. This state of things will continue for about fifteen or twenty minutes, during which time the oxygen in the atmospheric air combines with the carbon contained in the iron, producing carbonic acid gas, and at the same time evolving a powerful heat.

Now, as this heat is generated in the interior of, and is diffusive in innumerable fiery bubbles through the whole fluid mass, the metal absorbs the greater part of it and its temperature becomes immensely increased, and by the expiration of the fifteen or twenty minutes before-named, that part of the carbon which appears mechanically mixed and diffused through the crude iron has been entirely consumed. The temperature, however, is so high that the chemically-combined carbon now begins to separate from the metal, as is at once indicated by an immense increase in the volume of flame rushing out of the throat of the vessel. The metal in the vessel now rises several inches above its natural level and a light frothy slag makes its appearance, and is thrown out in large foam-like masses. This violent eruption of cinder generally lasts about five or six minutes, when all further appearance of it ceases, a steady and powerful flame replacing the shower of sparks and cinder which always accompanies the boil. The rapid union of carbon and oxygen, which thus takes place, adds still further to the temperature of the metal, while the diminished quantity of carbon present allows a part of the oxygen to combine with the iron, which undergoes combustion and is converted into an oxide. At the excessive temperature that the metal has now acquired, the oxide, as soon as formed, undergoes fusion, and forms a powerful solvent of those earthy bases that are associated with the iron. The violent ebullition which is going on mixes most intimately the scoria and metal, every part of which is thus brought in contact with the fluid oxide, which will thus wash and cleanse the metal most thoroughly from the silica and other earthy bases which are combined with the crude iron, while the sulphur and other volatile matters, which cling so tenaciously to iron at ordinary temperatures, are driven off, the sulphur combining with the oxygen and forming sulphurous acid gas.

The loss in weight of crude iron during its conversion into an ingot of malleable iron was found on a mean of four experiments to be 12½ per cent., to which will have to be added the loss of metal in the finishing rolls. This will make the entire loss probably not less than 18 per cent., instead of about 28 per cent., which is the loss on the present system. A large portion of this metal is however recoverable by treating with carbonaceous gases the rich oxide thrown out of the furnace during the boil. The slags are found to contain innumerable small grains of metallic iron, which are mechanically held in suspension in the slags, and may be easily recovered. I have before mentioned that after the boil has taken place a steady and powerful flame succeeds, which continues without any change for about ten minutes, when it rapidly falls off. As soon as this diminution of flame is apparent the workman will know that the process is completed, and that the crude iron has been converted into pure malleable iron, which he will form into ingots of any suitable size and shape by simply opening the tap-hole of the converting vessel and allowing the fluid malleable iron to flow into the iron ingot moulds placed there to receive it. The masses of iron thus formed will be perfectly free from any admixture of cinder, oxide or other extraneous matters, and will be far more pure and in a forwarder state of manufacture than a pile formed of ordinary puddle-bars. And thus it will be seen that by a single process, requiring no manipulation or particular skill, and with only one workman, from three to five tons of crude iron passes into the condition of several piles of malleable iron in from thirty to thirty-five minutes, with the expenditure of about one-third part the blast now used in a finery furnace with an equal charge of iron, and with the consumption of no other fuel than is contained in the crude iron.

To those who are best acquainted with the nature of fluid iron it may be a matter of surprise that a blast of cold air forced into melted crude iron is capable of raising its temperature to such a degree as to retain it in a perfect state of fluidity after it has lost all its carbon and is in the condition of malleable iron, which in the highest heat of our forges only becomes softened into a pasty mass. But such is the excessive temperature that I am enabled to arrive at with a properly-shaped converting vessel and a judicious distribution of the blast that I am enabled not only to retain the fluidity of the metal, but to create so much surplus heat as to remelt the crop ends, ingot runners, and other scrap that is made throughout the process, and thus bring them without labour or fuel into ingots of a quality equal to the rest of the charge of new metal. For this purpose a small arched chamber is formed immediately over the throat of the converting vessel, somewhat like the tunnel head of the blast furnace. This chamber has two or more openings on the

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sides of it, and its floor is made to slope downwards to the throat. As soon as a charge of fluid malleable iron has been drawn off fro m the connecting vessel the workman will take the scrap intended to be worked into the next charge, and proceed to introduce the several pieces into the small chamber, piling them up around the opening of the throat. When this is done he will run in his charge of crude metal and again commence the process. By the time the boil commences the bar ends or other scrap will have acquired a white heat, and by the time it is over most of them will have been melted and run down into the charge. Any pieces, however, that remain may then be pushed in by the workman, and by the time the process is completed they will all be melted, and ultimately combined with the rest of the charge, so that all scrap-iron, whether cast or malleable, may thus be used up without any loss or expense. As an example of the power that iron has of generating heat in this process, I may mention a circumstance that occurred to me during my experiments. I was trying how small a set of tuyeres could be used, but the size chosen proved to be too small, and after blowing into the metal for one hour and three-quarters I could not get up heat enough with them to bring on the boil. The experiment was therefore discontinued, during which time two-thirds of the metal solidified and the rest was run off. A larger set of tuyere pipes were then put in, and a fresh charge of fluid iron run into the vessel, which had the effect of e ntirely remelting the former charge, and when the whole was tapped out it exhibited as usual that intense and dazzling brightness peculiar to the electric light.

To persons conversant with the manufacture of iron it will be at once apparent that the ingots of malleable metal which I have described will have no hard or steely parts, such as is found in puddle iron, requiring a great amount of rolling to blend them with the general mass, nor will such ingots require an excess of rolling to expel cinder from the interior of the mass, since none can exist in the ingot, which is pure and perfectly homogeneous throughout, and hence requires only as much rolling as is necessary for the development of fibre ; it therefore follows that, instead of forming a merchant bar or rail by the union of a number of separate pieces welded together, it will be far more simple and less expensive to make several bars or rails from a single ingot ; doubtless this would have been done long ago had not the whole process been limited by the size of the ball which the puddler could make.

The facility which the new process affords of making large masses will enable the manufacturer to produce bars that on the old mode of working it was impossible to obtain ; while, at the same time, it admits of the use of some powerful machinery whereby a great deal of labour will be saved, and the process be greatly expedited. I merely mention this fact in passing, as it is not my intention at the present moment to enter upon any details of the improvements I have made in this department of the manufacture, because the patents which I have obtained for them are not yet specified. Before, however, dismissing this branch of the subject, I wish to call the attention of the meeting to some of the peculiarities which distinguish cast-steel from all other forms of iron, namely, the perfect homogeneous character of the metal, the entire absence of sand-cracks or flaws, and its greater cohesive force and elasticity as compared with the blister-steel from which it is made, qualities which it derives solely from its fusion and formation into ingots, all of which properties malleable iron acquires in like manner by its fusion and formation into ingots in the new process. Nor must it be forgotten that no amount of rolling will give to blister-steel (although formed of rolled bars) the same homogeneous character that cast-steel acquires by a mere extension of the ingot to some ten or twelve times its original length.

One of the most important facts connected with the new system of manufacturing malleable iron is that all the iron so produced will be of that quality known as charcoal iron, not that any charcoal is used in its manufacture, but because the whole of the processes following the smelting of it are conducted entirely without contact with or the use of any mineral fuel ; the iron resulting therefrom will in consequence be perfectly free from those injurious properties which that description of fuel never fails to impart to iron that is brought under its influence. At the same time, this system of manufacturing malleable iron offers extraordinary facility for making large shafts, cranks and other heavy masses ; it will be obvious that any weight of metal that can be founded in ordinary cast-iron by the means at present at our disposal may also be founded in molten malleable iron, and be wrought into the forms and shapes required, provided that we increase the size and power of our machinery to the extent necessary to deal with large masses of metal. A few minutes' such reflection will show the great anomaly presented by the scale on which the consecutive processes of iron-making are at present carried on. The little furnaces originally used for smelting ore have from time to time increased in size until they have assumed colossal proportions, and are made to operate on 200 or 300 tons of materials at a time, giving out 10 tons of fluid metal at a single run.



The manufacturer has thus gone on increasing the size of his smelting furnaces, and adapting to their use the blast apparatus of the requisite proportions, and has by this means lessened the cost of production in every way; his large furnaces require a great deal less labour to produce a given weight of iron than would have been required to produce it with a dozen furnaces, and in like manner he diminishes his cost of fuel blast and repairs, while he insures a uniformity in the result that could never have been arrived at by the use of a multiplicity of small furnaces. While the manufacturer has shown himself fully alive to these advantages, he has still been under the necessity of leaving the succeeding operations to be carried out on a scale wholly at variance with the principles he has found so advantageous in the smelting department. It is true that hitherto no better method was known than the puddling process, in which from 4 to 5 cwt. of iron is all that can be operated upon at a time, and even this small quantity is divided into homœopathic doses of some 70 lb. or 80 lb., each of which is moulded and fashioned by human labour, carefully watched and tended in the furnace, and removed therefrom one at a time, to be carefully manipulated and squeezed into form. When we consider the vast extent of manufacture, and the gigantic scale on which the early stages of progress is conducted, it is astonishing that no effort should have been made to raise the after processes somewhat nearer to a level commensurate with the preceding ones, and thus rescue the trade from the trammels which have so long surrounded it.

Before concluding these remarks, I beg to call your attention to an important fact connected with the new process, which affords peculiar facilities for the manufacture of cast-steel.

At the stage of the process immediately following the boil, the whole of the crude iron has passed into the condition of cast-steel of ordinary quality; by the continuation of the process the steel so produced gradually loses its small remaining portion of carbon, and passes successively from hard to soft steel, and from soft steel to steely iron, and eventually to very soft iron; hence at a certain period of the process any quality of metal may be obtained. There is one in particular, which by way of distinction I call semi-steel, being in hardness about midway between cast-steel and soft malleable iron. This metal possesses the advantage of much greater tensile strength than soft iron; it is also more elastic, and does not readily take a permanent set, while it is much harder, and is not worn or indented so easy as soft iron; at the same time it is not so brittle or hard to work as ordinary cast-steel. These qualities render it eminently well adapted to purposes where lightness and strength are specially required, or where there is much wear, as in the case of railway bars, which from their softness and lamellar texture soon become destroyed. The cost of the semi-steel will be a fraction less than iron, because the loss of metal that takes place by oxidation in the converting vessel is about 2½ per cent. less than it is with iron; but, as it is a little more difficult to roll, its cost per ton may fairly be considered to be the same as iron; but, as its tensile strength is some 30 or 40 per cent. greater than bar iron, it follows that for most purposes a much less weight of metal may be used, so that taken in that way the semi-steel will form a much cheaper metal than any we are at present acquainted with.

In conclusion, allow me to observe that the facts which I have had the honour of bringing before the meeting have not been elicited from mere laboratory experiments, but have been the result of working on a scale nearly twice as great as is pursued in our largest ironworks, the experimental apparatus doing 7 cwt. in thirty minutes, while the ordinary puddling furnace makes only 4½ cwt. in two hours, which is made into six separate balls, while the ingots or blooms are smooth even prisms, 10 inches square by 30 inches in length, weighing about equal to ordinary puddle balls.

TURKISH BATHS, WEST HARTLEPOOL.

These new baths have just been opened. The Turkish bath has become an institution in this country; a very large number of people use it as a luxury, as well as for purposes of cleanliness, besides being extensively used for remedial purposes. Many medical men are frequently found taking an active part in establishing Turkish bath companies and joining the board as directors. The Hartlepool Bath Company was formed to provide what was felt to be a pressing want. After purchasing the land, which was barely sufficient for their requirements, the directors consulted Messrs. J. Constantine & Son, of Manchester, as to the most economical mode of laying it out and providing the necessary baths, a Turkish and seven lounge baths, with all the necessary fittings to each. Every foot of land has been utilised, and a compact, complete and useful suite of baths has been provided. The building is good and substantial and of good design, and in its erection there has been no waste nor extravagance. It is doubtful if any town in Eng-

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land has been provided with such a set of baths at the same moderate cost. Mr. Constantine, sen. (J. Constantine & Co.), patentee of the convoluted stove, has had over forty years' experience in working and fitting of baths, and opened baths in Manchester as far back as 1850. What was required was the effectual and economical heating and ventilation of the Turkish bath, and maintenance of a high, steady and uniform temperature at a cheap rate. The importance and the necessity was seen of a rapid and constant change of air in the hot-rooms, to carry away the effluvia from perspiration. The chief difficulty was the defective heating apparatus then in use. Several years' experiments resulted in the invention of the convoluted stove, which effected a saving of fully half the fuel. With the invention of this apparatus the heating and ventilation of the Turkish bath became at once a definite and reliable science. The necessary size and heating power of apparatus for the cubical area to be heated, the size of inlet flues for warm air and outlet for vitiated air, is a mere matter of calculation.

ST. BARTHOLOMEW'S HOSPITAL.

AT a meeting of the City Commission of Sewers on Tuesday, at which Mr. G. Manners presided, Dr. Sedgwick Saunders, the medical officer of health, reported upon the plans submitted for the approval of the Commission for the drainage of St. Bartholomew's Hospital by the governors of that institution. He said it was extremely gratifying to find that the authorities intended to divide their drainage system into three sections on precisely the plans suggested by him in his report. So far, therefore, as the general disposition of the sewage was concerned, the Commissioners might give the plans their cordial approval; but he thought the pipes to be used were in excess of present or future requirements, and might be reduced to one-third with advantage. He also took exception to the "man-hole" arrangements, which he considered too far from the main drainage, and the junctions of the pipes ought to be made accessible. It was proposed to remove all the old brick-sewers and to fill in and make good the cavities, and this was a matter which should be specially insisted upon. The engineer (Colonel Haywood) also approved of the plans, and the Commissioners passed them as satisfactory, and requested Colonel Haywood to see that they were carried out, with the various modifications and suggestions which he and the medical officer had pointed out.

BIRMINGHAM STONEMASONS AND SCHOOL BOARD CONTRACTS.

AT the meeting of the Birmingham Trades Council on Saturday evening the secretary of the Stonemasons' Society moved the following resolution:—"That after the information regarding the stonework of Rea Street Schools which has been given to the Sites and Buildings Committee of the School Board, this Council regrets to find that they have not done justice to the ratepayers of Birmingham by having the stonework properly executed according to specification; and that we request all our local governing bodies to insert a clause in all building contracts prohibiting sub-contracting; and, further, we call upon the working men of Birmingham to vote at every election against the candidate who will not give his adherence to such request." He said that for the extension of Rea Street School there were specified Stackstead stone for the steps and landings and Coxbench stone for the heads and sills. Having received information from men in his trade, he went over the building with Mr. Jephcott, a member of the School Board. As a stonemason, he instantly saw that the stones in the steps and landings were not Stackstead, while all the sills were of coarse Hollington stone instead of Coxbench. Mr. Jephcott communicated with Mr. G. H. Kenrick, chairman of the Sites and Buildings Committee. The consequence of that was the subcontractor was compelled to pull down the staircase. But he believed that although some Stackstead stone had been put in, some of the old steps had gone in again. The last time he went over the building with Councillor Stevens he found that the Hollington stone sills had not been removed, and since then other two representatives of his society had gone over the building and found that the Hollington sills still existed; that one of them was broken in two and patched with cement, and that another was pieced with shellac. They also found a landing with a patch of Portland cement as big as the palm of a man's hand, and a step chipped in such a way that any one who put his heel upon it would go to the bottom of the stairs pretty quickly. When he first went over the building the sills were neither one thing nor another; when he ran his eye along them they looked about as straight as a dog's hind leg. Since that time the sub-contractor had had masons at work upon them, and had made them a little bit better. It was the bounden duty of their public bodies to appoint men of every trade to supervise their building work. It was impossible for a carpen-

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ter to understand stonework; a stonemason could not be expected to understand carpentry, and it was impossible for a bricklayer to understand either. Theoretical knowledge was not sufficient; there must be practical knowledge. The resolution condemned the system of sub-contracting. The practice of sub-contractors in the mason trade was to take jobs at prices at which honest builders could not compete with them. When the Victoria Courts were being built the contractor let the stonework to a Nottingham man, and this man used Shipley stone instead of the Green Moor stone that was specified. The Masons' Society communicated with the Corporation, and the sub-contractor had to put in the proper stone. Was it not time that they as trades unionists put an end to such things? There was nothing for it but to put an end to sub-contracting. In justice to the stonemasons of Birmingham he had felt bound to bring this matter forward. They had been told that stone would not stand in Birmingham. Was it likely, when stone not specified was put in, and when it was put in "bed-faced" instead of being put in as it grew in the quarry?

A member seconded the motion, and as one of those who had been over the Rea Street Schools endorsed the statements of the secretary. He also said that Stackstead stone was being introduced to prove that stone would stand as a building material in Birmingham. They were losing an honourable trade through the cursed way of doing business.

Another member said that a man had only to open his mouth loudly enough on a political platform to get appointed a clerk of the works in Birmingham. He believed that the reason why terra-cotta was pushed in Birmingham was that architects were interested in the sale of it. He should like to see a list of the shareholders in all the great terra-cotta companies published before the municipal elections.

Mr. Jephcott, as the member of the School Board with whom the secretary had communicated, explained the steps he had taken to bring the matter before Mr. G. H. Kenrick, the chairman of the Sites and Buildings Committee. In the last letter he received from Mr. Kenrick it was stated that the architects were disputing with the contractor the genuineness of the stone supplied, and that neither the steps nor the window-sills had been passed. Mr. Kenrick also said that he thought the architects could not be blamed for what had not yet been approved of by them. For himself, Mr. Jephcott said, he could not see how sub-contracting could be entirely done away with. According to the secretary, there were only four firms in Birmingham who could undertake the entire work of a building, and they could not very well limit public work to these four firms. Mr. Kenrick agreed with him in thinking that in all contracts the Sites and Buildings Committee should always hold the contractor responsible for all the sub-contracted work. One contractor should be responsible for the whole of the work. Another thing that was wanted was to have at least one labour representative on each of the spending committees. He had reason to believe that at least one would be placed on the Sites and Buildings Committee of the School Board after the election.

After some further discussion, the secretary said that the stone had been in the building three months, and it was time that the dispute was settled. A practical man could see at once that the stone was not what was specified. This was not the only complaint to be made about the building. He found in the basement about 18 inches of water, and was told that this was due to the foundations being below the height of the river Rea at the time they were laid. A cement casing, about a foot high and 1½ inch thick, had been put round the basement, but this was not a sufficient remedy. The water could run in and could not get out, so that whenever the river rose there would be water sapping the foundations.

The motion was carried unanimously.

PUBLIC WORKS IN GREENOCK.

THE annual statement has just been made by Provost Rodger on town improvements. He first referred to the proposed East-end Drainage Scheme, estimated to cost 7,650*l.* On account of its flatness, the ground in that part of the town was exceptionally difficult to drain. The Harbour Trust, through an overlook when their Bill of 1872 was passed, had found it impossible to implement obligations with regard to drainage placed upon them by that Bill. They could hardly go into a large scheme with the Police Board to drain the whole district, and the result was a compromise by which the Trust paid 1,500*l.* to the Police Board to get rid of the obligations. Besides, however, the Trust would have to pave the frontage as any other feuar, so that ultimately they would have to pay some thousands of pounds. Regarding the gradient, they had been told that a drain of this kind with a gradient of 1 in 600 would simply be a huge cesspool. As the question was discussed things had improved, and now they had agreed upon a gradient of 1 in 400, with flushing tanks on the upper streets to

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slush out the drain. On the question of the nuisance at Cartsdyke Harbour, it was proposed to carry an iron pipe further out, which, although it meant a little money, was a very simple matter; but it would improve the condition of the harbour, which was absolutely necessary. As to the Gas Trust, they were now putting in a new gas-holder at a cost of 6,000*l.*, and which would be finished at the end of this month. He was glad to be able to state that up till this date there had been, as compared with the corresponding period of last year, an increased make of gas representing 400*l.* It was most probable, therefore, that at the close of the year they would be able to reduce the price 2½*d.* per 1*l.*, or possibly something more.

BUILDING REGULATIONS IN GLASGOW.

THE New Buildings Regulation Bill drafted by the special committee of the Glasgow Police Commissioners appointed last spring in terms of a motion proposed by Mr. Ure Primrose for providing building regulations for the city and for other purposes has, the *Glasgow Herald* says, now been printed, and will be in the hands of the members of the Town Council in a few days. The committee have spent a great deal of time over the adjustment of the clauses, and we believe the Bill will be found to be a comprehensive and valuable measure. It opens with the usual defining and interpreting clauses. Next there is a provision empowering the Police Commissioners to make by-laws in connection with the various subjects embraced, and further, giving them authority to repeal and re-enact by-laws at pleasure, due notice being given by advertisement in two daily newspapers published in Glasgow. The clauses following relate to the powers of the Dean of Guild Court. It is provided that when decree of lining has been granted by the Court it shall be a depending process until the work sanctioned has been completed; and the Master of Works is authorised at any time to stop the work and request the intervention of the Dean of Guild Court; and a lining is not to be held as completed until a report is submitted by the Master of Works. In regard to noxious trades the Bill sets forth that the Dean of Guild Court shall not grant a warrant for the erection or the extension of a building for the carrying on of such trades without the consent of the Local Authority. The Master of Works, or any inspector appointed by him or by the Commissioners, is empowered to enter and inspect all buildings in course of erection or alteration, and likewise to enter all public buildings while open to the public, and any obstruction offered to such official renders the offenders liable in a penalty of 5*l.*

In the clauses relating to the laying out of new streets, it is provided that squares or parallelograms shall have through ventilation either by intersecting lanes or spaces left between the buildings at the corners of squares. A penalty is made exigible in the event of a barricade being continued on the street after the time granted by the Dean of Guild Court. Power is given to the Commissioners to construct and thereafter maintain bridges, tunnels, passages or subways, with the necessary accesses or approaches, over any street, and they may grant such power to any owner of lands and heritages fronting or abutting on any street. The height of a building is limited according to the width of a street, and it is proposed to enact that the building shall be measured, not from the top of the front wall as at present, but from the floor to the ceiling of the highest inhabited room or apartment in such building, or the top of the parapet, whichever may be highest. The amount of free space for dwellings and sleeping apartments is defined. Warehouses or tenements are limited to not more than 300,000 cubic feet of space between the walls. Any warehouse or tenement exceeding such space must be subdivided by party-walls.

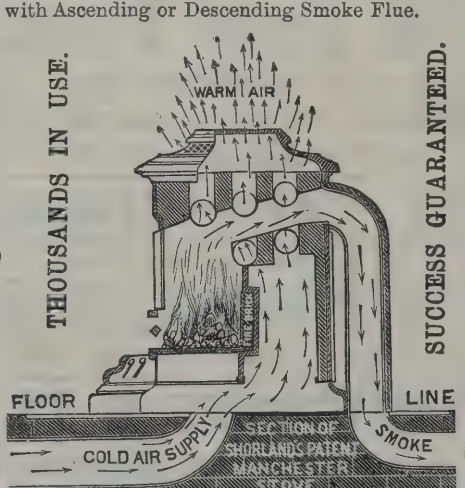
The Dean of Guild Court has at present powers in regard to the size of the apartments in dwelling-houses. In the new Bill it is provided that in reducing by subdivision large-sized houses, houses of one apartment shall contain at least 1,000 cubic feet, two apartments 1,600 cubic feet, and three apartment 2,400 cubic feet, exclusive of lobbies, closets, presses and recesses. All sleeping apartments, except in attic-rooms, shall be at least 9 feet high from floor to ceiling, and every attic storey shall be at least 8 feet from floor to ceiling throughout at least one-half of the area of the room. In building or rebuilding dwelling-houses it shall not be competent to adopt such form of construction that more than sixteen separate occupancies shall enter from one common stair or passage, or more than twenty-four separate occupancies from one stair or balcony outside the tenement, or more than one house from one landing. Enclosed beds are prohibited. The master of works may by notice require the owner of any occupied building to make alterations so as to provide sufficient means of lighting, ventilation and drainage, and on failure of the owner to comply with such notice, the Dean of Guild Court is empowered to interdict the use of such building until effect is given to the terms of the notice.

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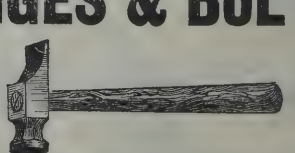
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structed of non-combustible material, and at the end of seven years after the passing of the Bill all then existing buildings which do not comply with the terms of the Act shall be altered under penalty. The Court may grant exemption in regard to blocks of labourers' houses, hotels and public buildings generally. Wooden buildings or erections are prohibited, unless separated by a space equal to their height from any other building. Foundations must be laid to the satisfaction of the Master of Works of cube stones, concrete, bricks laid in cement or other suitable material. Chimney-stacks must be built as high as the chimney-top of any chimney within 100 yards distance, or the Dean of Guild Court may order such stack or flue to be carried up to a sufficient height to carry off the products of combustion without offence to the occupants of neighbouring buildings. Any person intending to add to the number of furnaces connected with a chimney must give notice of such intention and obtain a warrant from the Dean of Guild Court authorising him to do so. No building shall be occupied until the soil-pipes have been examined by the sanitary inspector and certified to the Dean of Guild Court as satisfactory. Water-closets must in future be placed in external walls of buildings, and must be sufficiently ventilated to the outside. Every closet must have a cistern distinct from the house-supply; the soil-pipes and waste water-pipes must not be connected but must be carried independently to the drains.

The chief officer of the Fire Brigade is empowered to remove dangerous buildings damaged by fire, to enclose and barricade streets, lanes and courts; and the expenses incurred in the execution of these powers are recoverable from the owners of the property. When a building, or part of a building, is occupied as a theatre, music hall, or for making, storing or selling hazardous goods, it is declared unlawful for any owner to let, or for any person to take a lease, or to suffer to be used as a dwelling-house any part of such building situated above such theatre or other premises, unless such dwelling-house is completely disconnected from the other parts of the building. This provision applies to all existing buildings not already occupied in the manner described, and on the expiry of seven years it shall be enforced in respect to all buildings in the city, non-compliance involving a penalty of 1*l.* per day.

Where a warehouse occupies more than two floors of a building, it is declared unlawful to have workrooms above the first storey in which more than ten persons are employed, unless such workrooms are provided with a separate passage or staircase giving access to the street or passage. Where more than forty persons are employed on an upper storey, or in a building the access to which is from a lower storey and not by separate stair, the occupier must provide at least two separate stairs or means of exit from such storey 25 feet apart. These clauses will apply to all buildings on the expiry of seven years after the passing of the Act, under a penalty the same as that in the preceding clause.

Every factory, mill, workshop or similar work which is more than one storey in height and 30 feet in length shall have an escape-staircase of fireproof construction placed not less than 5 feet clear of such factory or work, with a fireproof gangway from each floor of not less than 4 feet wide, and the doors of the gangway are to open outwards, and remain unlocked during the working hours. Every factory or workshop more than 80 feet in length shall have one escape-staircase and gangway for each 80 feet in length. It is declared to be unlawful to fit up on an upper floor of any new or existing building any steam-engine, gas-engine, boiler or heavy machinery unless such building is specially constructed for the purpose, or unless such engine or other machinery shall rest upon beams or columns of stone, brick or other incombustible material. Heavy machinery means machinery exceeding 280 lbs. per square foot of floor space occupied by such machinery. No theatre accommodating more than 1,000 persons shall, it is provided, be built unless it has free space on three sides of at least 15 feet in width, and sufficient means of egress into two streets.

When the Master of Works or any of his inspectors finds any operation in progress contrary to the Act or the Act of 1866, or of any by-law made in virtue of these Acts, they are empowered forthwith to stop such work, and to take precautions, by the appointment of a watchman or otherwise, that it shall not be resumed until such officer has had an opportunity of bringing the same before the Dean of Guild Court, and constables of police are to be bound to render the Master of Works or his inspector such assistance as he may require. Workmen contravening the Act or by-laws are to be liable to a penalty not exceeding 5*l.*

In the by-laws appended to the Act it is provided that no building shall be erected at greater height than the width of the street. Unless where the foundation of a building consists of sand, gravel, or virgin soil, it must be covered with a layer of concrete 6 inches thick. Clauses are inserted regarding the composition of mortar, concrete and other materials used in building. Projections abutting on the street are prohibited,

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except for architectural ornament. Balconies and platforms or galleries are not allowed over any window or sleeping apartment at a height of less than 12 feet above the floor of such apartment. In buildings one storey in height of stone or concrete the walls must be 16 inches thick; of two storeys, 18 inches; three storeys, 20 inches; four storeys, 24 inches. In buildings exceeding four storeys in height the thickness of each of the first two storeys shall be increased by 4 inches for each additional storey. In brick buildings of one storey the thickness shall be 9 inches; of two storeys—first storey 14 inches, second 9 inches; of three storeys—first 18 inches, the second and third 14 inches; of four storeys—first 22 inches, second 18 inches, and third and fourth 14 inches. In all the buildings above four storeys in height the thickness shall be increased by 4½ inches for each additional storey, and no part of the wall shall be less than 14 inches thick. Any wall more than one storey in height, or longer than 45 feet, or which is used as a bearing wall for a span more than 60 feet, shall be thicker to the extent of one-third than the several dimensions mentioned for an external wall of the same description. Iron columns shall be composed of malleable iron, or, if of cast-iron, shall be surrounded by plaster or cement. Openings in party walls must be secured with double iron doors, and the frames must be bolted through the walls. The gable wall of every dwelling-house must be carried 15 inches above the roof, and in warehouses 3 feet through the roof. Every hoist exceeding 6 square feet must be closed within incombustible walls, and must be carried through the roof to the extent of 3 feet, and the communicating doors on each floor must be of iron. The carrying timbers of buildings are increased from 30 to 50 per cent. Chimneys must be guarded with iron railings of suitable height. There are clauses relating to the insertion of timber near fireplaces and in regard to the alteration of chimneys originally erected for domestic purposes when used for ranges, hot-plates, ovens, or other commercial or manufacturing purposes. Other clauses provide for the construction of fireplaces and chimney-openings of incombustible material, and wooden mantelpieces must not project beyond the face of the jamb more than 1 inch for every 2 inches of vertical distance from the fireplace opening. Stoves, ovens or boilers used for the purposes of trade must not be placed on a wooden floor unless it is laid on a bed of concrete, brick or other incombustible material. Mansard roofs, or roofs steeper than 45 degrees, are prohibited in warehouses and business premises. Every owner desiring drains or pipes tested by the sanitary inspector must give a written notice to the inspector. Drains passing under dwelling-houses must be completely surrounded with Portland cement, and no drains or junctions connecting drain-pipes and plumberwork shall be covered up until after the owner has given the Master of Works three days' notice to enable him to examine and test the same. Only hard-metal gas-pipes are to be used in any new or existing building other than a dwelling-house. Provisions are also made regarding the safety of the public in connection with electric installation. Passages, corridors, staircases and stairs in all public buildings must be of stone or brick or other incombustible material, and must be so placed that from every part of the building there shall be easy exit. All stairs must have handrails on each side. Exits from public buildings shall be not less than 1 foot in width for every seventy persons who can be accommodated within the building. Provision is made for safe and easy exit for performers, and it is laid down that their dressing-rooms must not be of inflammable materials.

ROOF-DRENCHERS.

THE following statement appears in the *Glasgow Herald*:—

In an important commercial centre such as Glasgow anything which tends to minimise the risks of fire is deserving of earnest attention. As it happens, the proprietors of the *Glasgow Herald* have had only too good reason to dread the outbreak of fire which on three occasions within the last fifteen years has swept round their establishment. These perils have arisen not from any default of our own, but from the misfortunes of others. The greatest conflagration of this nature was that which occurred near the end of 1883 in Messrs. Wylie & Lochhead's premises in Buchanan Street. On that occasion the shooting flames and flakes overleapt and set fire to the roofs of the three buildings between Buchanan and Mitchell Streets, which together constitute the offices of the *Herald*. Hissing beyond, the flames communicated with a building in Mitchell Lane, which, like the huge pile belonging to Messrs. Wylie & Lochhead, was burned to the ground. The *Herald* buildings, thus threatened on both sides, and with the roofs actually alight, were saved chiefly through the well-directed energy of the employés, who used to good purpose the fire-extinguishing appliances always kept on the premises. In two other instances the establishment almost as narrowly escaped sharing to the full the calamities of its neighbours. This would seem to show

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Solid 1-inch Oak, straight boards, laid and polished, at £6 18*s.* a square.
Solid ¼-inch Oak Parquet for covering Deal Floors, laid and polished, from £5 a square.
Oak Wood Tapestry Dadoes, from 1*s.* per foot super.
Walnut or Mahogany, from 1*s.* 3*d.* per foot super.
Ditto, with Heavy Mouldings, 4*d.* foot extra.
Ditto, ditto, with Carved or Painted Panels, prices according to sketches.

Prices given for all Interior Work, Doors, Architraves, Over-doors, Chimney-pieces, Stoves, and Hearths.
Architects' and Surveyors' attention particularly called to the above quotations for

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that the *Herald* offices bear a charmed life. It is pleasant to think so, but the argument is one which would avail little with an insurance company, and accordingly we have endeavoured so far as possible to reduce the risks which must be run by the adoption of all the latest appliances for the prevention and extinction of fire. The various departments have been fitted up with the Grinnell automatic sprinklers, consisting of pipes carried along the ceiling of every apartment, from which plentiful streams of water are at once released at an emergency. Outside the main building, and at a considerable height, a water-tower has been erected containing 3,500 gallons, always available, and in the machine-room, a little below the level of Mitchell Street, is a tank containing 3,000 gallons of water drawn from the street mains. This tank was originally erected for the supply of the Grinnell sprinkler installation, but has now the important auxiliary of a Worthington force pump, by means of which the water may be carried to the highest point of the building, or beyond it, at a minute's notice. While a good deal had been done in the direction indicated, the fact remained that our dangers in the past had always arisen from fire in adjoining properties being communicated to the roofs and windows of the *Herald* buildings. Mr. Alexander Sinclair, manager of the *Herald*, gave the subject long and anxious consideration, and in the end he devised a scheme at once simple and effective for drenching the roofs and exposed windows instantaneously and keeping them under flowing water for an indefinite time. As we have seen, there is an ample supply of stored water always at command. By the agency of the force-pump, which works automatically, the water is forced to the roofs, along the highest part or rigging of which, and also over all the windows, are carried malleable iron pipes, finished with zinc to prevent rusting and perforated every 3 inches to 18 B.w.g. In a few seconds after the water has been turned on the roofs and windows are drenched by an unbroken stream, and this, as we have said, may be maintained for any length of time, the 6,500 gallons in store being renewed as the flow proceeds. When the water has been turned off the pipes are run absolutely dry, so as to avoid the risk of freezing in cold weather. The roof-drenchers are used periodically to keep them at all times in perfect working order. So far as we are aware, no such method exists elsewhere of rendering fireproof the outsides of buildings, where, as our own experience has shown, the danger of borrowing a conflagration from one's neighbours is greatest. The roof-drenchers have been subjected to a practical test in presence of Lord Dean of Guild Guthrie Smith, Mr. Whyte, master of works; ex-Deacon Convener Mason; Mr. William Ure; Mr. David Dunlop, district manager of the Palatine Insurance Company; Mr. D. L. Laidlaw, general manager of the North British and Mercantile Insurance Company, &c. At the close the Dean of Guild, Mr. Whyte, and the other gentlemen expressed to Mr. Sinclair the greatest satisfaction with the results of the experiments. This system of roof-drenching, it may be added, has not been patented, and may be applied to places of business in the city.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

16894. Edward Moloney, for "The drainage of damp basements of houses."

16929. Joseph Slater Lewis, for "An improved method of manufacturing metal window-sashes or frames."

16984. Reuben Robisher and Edwin Greenhalgh, for "Improved means for raising and lowering windows."

17006. Ivan Lange, for "Apparatus for sanding bricks and the like."

17025. Thomas Ledward, for "Improvements in bench and other vices."

17031. Mark Lawton, for "Improvements in sockets of window-fittings."

17100. Wm. Douslin, for "An improvement in mortice-locks."

17105. John Stephen Walley, for "The fastening of stable doors," and proposed to call "The Combermere patent combined lock and stable-door fastening."

17112. Peter Parker, for "An improved coffin-lid."

17176. Hugh Donald Fitzpatrick, for "Improvements in locks." (Hugo Steinke, Germany.)

To INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CASSELL, Patent Agents, 37 Chancery Lane, London, W.C.

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Designs and Prices on Application.

JAMES EGAN
(Ten years with MORRIS & Co.),
DECORATOR & STAINED GLASS PAINTER.
Estimates and Designs for the Decoration of Public and Private Buildings submitted on application.
38 BROAD STREET, GOLDEN SQUARE, W.
(Late 34 BERNERS STREET, LONDON, W.)

HENRY KING
(Late GREEN & KING),
HOUSE PAINTER, UPHOLSTERER AND GENERAL CONTRACTOR,
Lower Seymour St., Portman Sq., W.
Late of 100 NEW BOND STREET).
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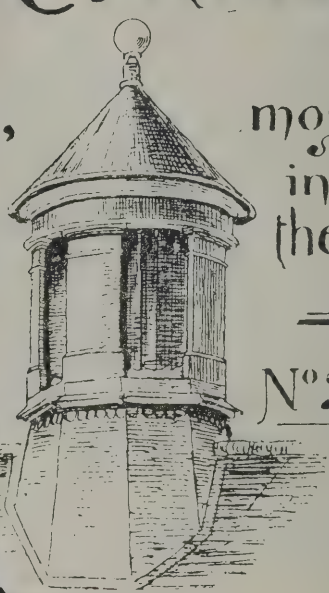
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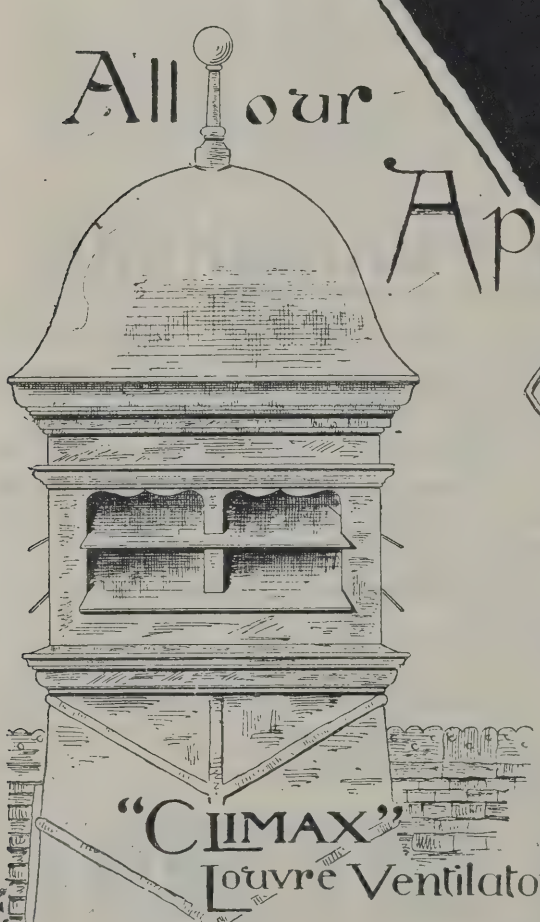
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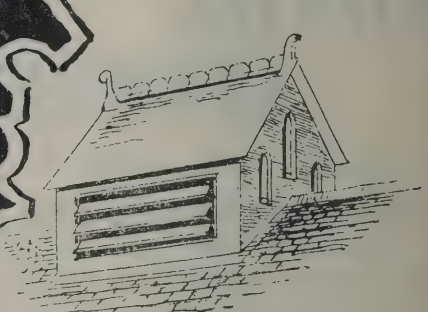
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Friday, October 23, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, OCTOBER 30, 1891.

COMPETITIONS OPEN.

BATH.—Oct. 31.—Designs are invited for Additions to Municipal Buildings. Mr John Stone, Town Clerk, Guildhall, Bath.

BELFAST.—Dec. 1.—Competitive Plans are invited for a Hospital for Diseases of the Chest. Details can be had from Mr. F. Howard Sinclair, M.D., hon. sec. med. staff, 76 Pakenham Place, Belfast. Plans to be sent in in a sealed envelope, accompanied by a motto.

BURTON-ON-TRENT.—Nov. 21.—Designs are invited for Truant School. Mr. W N. Graham, School Board Offices, Burton-on-Trent.

FESTINIOG.—Oct. 31.—Plans and Estimates are invited for Electric Lighting. Mr. R. Walker Davies, Solicitor, Blaenau, Festiniog, North Wales.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

LICHFIELD.—Nov. 21.—Designs are invited for proposed Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

MERTHYR TYDFIL.—Nov. 12.—Plans are invited for School Buildings. Mr. E. Stephens, School Board Offices, Merthyr Tydfil.

CONTRACTS OPEN.

ABERDARE.—Oct. 31.—For Building Hotel, &c. Mr. William Thomas, Bryntawell, Aberdare.

ANTRIM.—Nov. 10.—For Building Organ-chamber and Internal Alterations to Parish Church. Mr. S. F. Close, Architect, 53 Waring Street, Belfast.

BARRY DOCK.—Nov. 14.—For Constructing Lock. Mr. J. Wolff Barry, 21 Delahay Street, Westminster, S.W.

BANCHORY.—Nov. 4.—For Building House for Dr. M'Hardy. Messrs. Jenkins & Marr, Architects, 16 Bridge Street, Aberdeen.

BLACKPOOL.—Oct. 30.—For Building Four Houses, for the Claremont Park Company. Messrs. Garlick & Sykes, Architects, 12 Church Street, Blackpool.

BLAENGARW.—Oct. 31.—For Building Reading and Library Rooms. Mr. Evan Griffiths, International Colliery Offices, Blaengarw, near Bridgend.

CARDIFF.—Nov. 2.—For Building Lodge, Preswylfa. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CARDIFF.—Nov. 11.—For Building Assembly Rooms, Shops and Premises. Mr. E. A. Lansdowne, Architect, 26 High Street, Newport, Mon.

CINDERFORD.—Nov. 7.—For Building Wesleyan Sunday School and Classrooms. Mr. John Wills, Architect, Derby.

CLEVEDON.—Nov. 30.—For Constructing Pier-head, with Band Stand and Pavilions. Mr. G. N. Abernethy, Engineer, 4 Delahay Street, Westminster, S.W.

CONWAY.—Oct. 31.—For Levelling, Metalling and Making-up Roads. Mr. Wm. Menzies, Surbiton House, Englefield Green, near Egham.

CORK.—Nov. 3.—For Fitting-up Lavatories, Baths and Heating Appliances at the Extension Buildings of Lunatic Asylum. Mr. Hill, Architect, 15 Marlborough Street, Cork.

DOWNPATRICK.—Oct. 31.—For Constructing Waterworks. Mr. J. W. Montgomery, Union Offices, Downpatrick.

FULHAM.—Nov. 4.—For Making-up and Paving Roads, and Supplying and Laying Pipe Sewer. Mr. W. Sykes, Surveyor, Town Hall, Walham Green.

GLASGOW.—Nov. 5.—For Alterations to Western Police Buildings. Mr. J. Lang, City Chambers, Glasgow.

GOOLE.—Nov. 5.—For Building Stores for Hull Brewery Company. Mr. C. A. B. Tudor, Architect, Carlisle Terrace, Goole.

GORSEINON.—Nov. 2.—For Building Board School. Mr. D. Isaac, 7 Rutland Street, Swansea.

GREAT YARMOUTH.—Oct. 31.—For Alterations to Theatre Royal. Mr. Frank Matcham, Architect, London.

GUILSBOROUGH.—Nov. 3.—For Construction of Filter Beds Coton Mill. Mr. John Eunson, Engineer, Nottingham.

HALIFAX.—Nov. 6.—For Building Shop Premises. Messrs. George Buckley & Son, Architects, Tower Chambers, Halifax.

HOMERTON.—Nov. 4.—For Constructing Iron Balconies and Staircases. Mr. J. Owen-Perry, Hackney Union, Homerton, N.

HOMERTON.—Nov. 4.—For Building Chimney Stacks. Mr. Keith D. Young, Architect, 17 Southampton Street, Bloomsbury, W.C.

HUDDERSFIELD.—Nov. 2.—For Building Shop and Four Dwelling-houses. Mr. J. Berry, Architect, 9 Queen Street, Huddersfield.

ISLINGTON.—Nov. 2.—For Constructing Brick and Stoneware Pipe Sewer, with Manholes, &c., and Supplying and Fixing Iron Bar and Wire Fencing. Mr. J. Patten Barber, Chief Surveyor, Vestry Hall, Upper Street, N.

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KENSINGTON.—Nov. 5.—For Constructing Fire-Escape Staircase. Mr. J. W. Aldwinckle, Architect, 1 Victoria Street, S.W.

LEYTON.—Nov. 3.—For Sewer Works. Mr. William Dawson, Surveyor, Town Hall, Leyton.

MALVERN.—Nov. 2.—For Constructing Waterworks. Mr. John E. Palmer, Surveyor, Local Board Offices, Great Malvern.

MORTHOE.—Oct. 31.—For Building Four Cottages. Mr. Arnold Thorne, Architect, Cross Street, Barnstaple.

NEW TREDEGAR.—Oct. 31.—For Building Infants' School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

PEEL.—Nov. 6.—For Building Court House. Mr. H. Story, Government Offices, Douglas, Isle of Man.

SHEFFIELD.—Nov. 4.—For Building Police-station and Constables' Dwellings. Mr. C. F. Wike, Borough Engineer, Bower Spring, Sheffield.

TOTTENHAM.—Nov. 3.—For Constructing Pipe Sewer and Making-up Road. Mr. J. E. Worth, Engineer, Coombes Croft House, High Road, Tottenham, N.

WEST LOOE.—Nov. 17.—For Building Coast Guard Station. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

WESTMINSTER.—Nov. 11.—For Constructing Swimming-Bath. Messrs. Spalding & Cross, Architects, 15 Queen Street, Cheapside, E.C.

WINCHESTER.—Nov. 14.—For Building County Offices. Mr. James Robinson, Architect, County Hall, Winchester.

WITHAM.—Nov. 9.—For Building Schoolrooms, &c. Mr. Humphreys, Superintendent, South Metropolitan School, Witham, Essex.

TENDERS.

BIRKENHEAD.

For Street Improvement Works, Birkenhead and Tranmere. Mr. T. C. THORBURN, Borough Surveyor.

W. Maddocks & Co., Birkenhead	£573 15 9
J. & F. Savage, Seacombe	548 4 6
W. H. Bleakley & Co., Birkenhead	500 0 0
W. F. CHADWICK, Liverpool (*accepted*)	499 14 10

BRADFORD.

For Building Co-operative Store and Four Houses, Heaton and Firth Roads, for the Bradford Provident Industrial Society, Limited. Messrs. RYCROFT & FIRTH, Architects, Bank Buildings, Manchester Road, Bradford.

Accepted Tenders.

Brown & Craven, mason work.
G. H. Clark & Co., joiner work.
Matthew & Slinger, plumber work.
J. Smith & Son, plasterer work.
Hill & Nelson, slater work.
W. Townson, painter work.

HALIFAX.

For Building Fire Brigade Station, Halifax, including Eight Dwelling-houses.

Accepted Tenders.

Adam Foster, mason	£2,923 0 0
John Mansley, joiner	792 17 0
John Naylor & Son, plumber and glazier	395 0 0
John Marshall, plasterer	349 0 0
John Berry, ironfounder	292 1 0
Murgatroyd Brothers, painter	67 2 0
Total	4,819 0 0

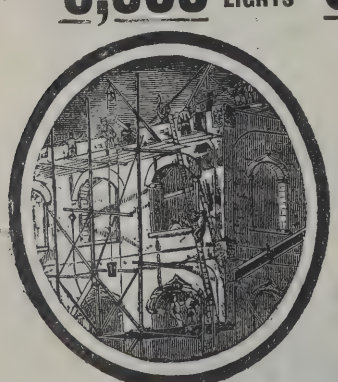
The tender of Thos. Try, London, for providing and fixing automatic apparatus to sets of front doors, one set of back doors, and two stable doors at the station for 160*l.* has been accepted, and of F. E. Stuart, of Twickenham, for supplying and fixing an electric-call system from the watch-room to the firemen's bedroom and the superintendent's bedroom and sitting-room for 40*l.*

LEWES.

For Building Public Hall, and Additions, Alterations and Improvements to Municipal Buildings, Lewes. Mr. SAMUEL DENMAN, Architect, 26 Queen's Road, Brighton. Quantities by the Architect.

C. & F. Cheesman, Brighton	£7,600 0 0
J. Langley & Co., Crawley	7,582 0 0
Wallis, Balham	7,446 0 0
V. P. Freeman, Brighton	7,400 0 0
W. Botting, Brighton	6,750 0 0
P. Peters, Horsham	6,750 0 0
J. FLOYD, Lewes (*accepted*)	6,657 15 0

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LEEDS.

For Alterations to 166 and 167 Briggate, Leeds. Mr. W. H. Beevers, Architect, 22 Bond Street, Leeds.

T. Hannam, Leeds (*accepted for the whole*)	£459	15	0
Supplementary estimate	24	13	0

LONDON.

For Erection of Building of Two Rooms and a Bathroom at South Wharf, Rotherhithe, for the Metropolitan Asylums Board.

F. C. Stokes & Co., Walworth	£181	4	0
Jones & Groves, Greenwich	164	0	0
J. R. Hunt, Bow Common	162	0	0
J. Frampton, East Dulwich	147	0	0
W. Fowler, Hampstead Heath	145	0	0
W. & E. Mills, Westcombe Park	124	10	0
J. Richards, Borough (*accepted*)	120	0	0

MELTON.

For Works for Supplying Water to County Asylum, Melton, near Woodbridge. Mr G. Hodson, F.G.S., Engineer, Abbey Buildings, Prince's Street, Westminster, S.W.

R. R. Facey, Taunton	£5,427	0	0
W. Neil, Bow, E.	5,288	0	0
G. Double, Ipswich	5,249	0	0
F. Bennett, Ipswich	5,100	0	0
H. Wilcock, Wolverhampton	5,085	0	0
J. J. Robson, Westminster	4,861	0	0
E. Adams, Woodbridge	4,705	0	0
J. W. Bray, Great Yarmouth	4,680	0	0
G. Grunwood & Sons, Ipswich (*accepted*)	4,597	0	0

MORLEY.

For Improvement Works, Fountain Street. Mr. M. H. Sykes, Borough Surveyor, Morley.

T. Lane, Lincoln	£3,247	0	0
J. Speight, Leeds	3,120	8	2
T. & G. Wilson, Wakefield	2,950	0	0
G. Walker, Leeds	2,882	17	2
D. Speight, Leeds	2,795	0	0
W. Binns, Bradford	2,752	11	0
J. & J. Sugden, Morley (*accepted*)	2,432	9	0

PRESTON KIRK.

For Supplying the Grundy Patent Warm Air Ventilating Grates to Newbyth, Preston Kirk, N.B., the Residence of Sir David Baird, Bart.

J. Grundy, 30 Duncan Terrace, London (*accepted*).

SALFORD.

For Iron and Steelwork in Construction of Sherbourne Street Bridge, for the Salford District Highway Committee.

De Bergue & Co.	£4,441	4	8
Abutments.			
A. Kellett	2,300	0	0

STOKE POGES.

For Alterations and Additions to Stables and Lodge at Carton Tower, Stoke Poges, Bucks. Mr. J. M. Ferguson, Architect, 55 Chancery Lane, W.C.

Silver & Sons, Maidenhead	£218	0	0
Hartley, Wexham	170	0	0
Almond, Burnham	148	0	0

WARWICK.

For Decorating Rooms in Court-house, Warwick.

Holt & Co., Warwick (*accepted*)	£250	0	0
Plucknett & Co.	250	0	0

Messrs. Plucknett will be paid Five Guineas as an honorarium for the preparation of a scheme.

WEYMOUTH.

For Painting Interior of Guildhall, Weymouth.

L. Jesty	£65	0	0
R. A. Ayles	50	0	0
R. A. Rendall (*accepted*)	49	15	0

TRADE NOTES.

Messrs. Gillett & Johnston, clock manufacturers and bell-founders of Croydon, have just succeeded in obtaining the order (in competition with some of the best firms in the country) for a large clock, to be constructed to strike the hours on a 20 cwt. bell, chime the Westminster quarters, and show the time on four 7 feet 6 inch dials, for Eastbourne Town Hall. The clock, &c., is to be of the best materials and workmanship, and to have all the latest improvements.

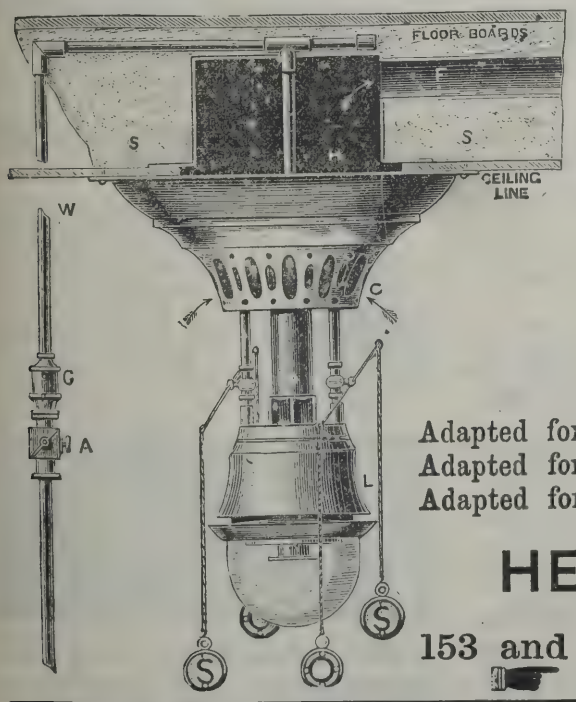
The tendering for the New Front Road improvements, Ramsgate, was of a very close character. With the exception of two tenders, which were evidently not meant for competition, they varied from 35,600*l.* to 45,948*l.*, the average of the whole being 39,801*l.*, against the engineer's (Mr. Wm. R. Valon) estimate of 39,149*l.* for this part of the work. This speaks well for the correctness of the drawings, specification and quantities. The engineer's estimate for the total structural

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work was given in the first instance at 45,000*l.*, which sum was increased to 48,047*l.* at the desire of the quantity surveyors, Messrs. Hovenden & Berridge, so as to leave a safe margin. By the price of the accepted tender, however, it seems that the original estimate of the engineer will not be exceeded.

A LOCAL GOVERNMENT BOARD inquiry has been held at Kegworth by Major-General Carey, R.E., with respect to an application for sanction to borrow 5,000*l.* for sewerage and sewage disposal purposes. Mr. W. H. Radford, C.E., of Nottingham, is the engineer for the scheme, and he explained the plans. It is proposed to construct new pipe-sewers to deliver the sewage by gravitation to the sewage disposal site, where it would be pumped a lift of about 12 feet, and purified by broad irrigation on 8 acres of suitable land.

THE contract for the foundations for the Eiffel Tower, Blackpool, as we announced last week, has been let to Messrs. Robert Neill & Sons, builders and contractors, of Manchester. Their estimate, we learn, amounts to 2,447*l.* The architects for the work are Messrs. Maxwell & Tuke, 29 Princess Street, Manchester.

THE Electric Lighting Committee of the Glasgow Town Council, it is understood, have, on the recommendation of Sir William Thomson, decided to have a scheme of electric lighting on the "low-tension system" prepared for the city by Professor A. B. W. Kennedy, of London.

THE electric tramway along Roundhay Road, Leeds, which has been constructed by the Thomson-Houston Electric Company, has been satisfactorily tested. The formal opening was to take place yesterday.

A NEW clock has been supplied for the village of Hoyland, near Barnsley, manufactured by Messrs. Potts & Sons, Leeds. The clock shows the time on four illuminated dials 5 feet in diameter, made of skeleton cast-iron frames and glazed with white opal glass. The clock has four sets of strong dial or motion wheels for carrying the hands with double and single universal joints, all gun-metal or the best hard brass; four pairs of strong copper hands, correctly balanced or counterpoised within. The clock at Hoyland is from the designs and plans of Lord Grimthorpe, and is constructed on a solid horizontal cast-iron bed-frame, planed perfectly flat; all bushes are of gun-metal, screwed into the frame so that each or any wheel can be taken out separately if required in case of alteration or accident. The large main wheel of the going part has maintaining power attached to keep the clock going during the time of winding up. The clock has also Lord Grimthorpe's double three-legged gravity escapement, the finest improvement ever introduced for making a clock to keep correct time, and also compensated pendulum attached with heavy cylindrical-shaped bob, so that the clock will not be affected by any variations of temperature. The striking part, large or main wheels, has the necessary cams attached for lifting the hammer suitable for striking upon the fine bell in the tower, which bell is made of best bell-metal and weighs 4 cwts. The clock has also patent steel cords, cranks, levers, hammer, weights, block pulleys, bushed with brass and pivoted in, automatic gas apparatus for turning the light up or down according to the season of the year.

THE last of the series of massive iron girders and columns required for the colossal new holder now being constructed for the Westhoughton Gas Company at their works in Bolton Road, has been, the *Bolton Chronicle* says, fixed up. The holder-plates are being put together on the ground, and the whole work is expected to be completed, and the holder put in use, during December. It will have a capacity for storing upwards of 200,000 cubic feet of gas. The tank is 84 feet in diameter and 24 feet deep, and will require 3,000 tons of water to fill it.

IT was resolved at the meeting of the Gloucester City Council that, where practicable, city contracts should be given to local tradesmen, and that no contractor should be employed unless he paid not less than the maximum standard rate of wages, and that the Corporation should pay its workmen the standard wages.

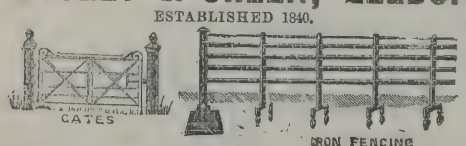
A TRIAL is being made in Paris of a new system of wood-paving. It consists of pieces of oak about 4 inches long, split up similarly to the ordinary firewood, and laid loosely on end in fine sand on a bed of gravel from 4 inches to 4½ inches in thickness. A layer of fine sand is then spread over them, and they are alternately watered and beaten several times. In about forty-eight hours the humidity has completely penetrated and caused the wood to swell, and it is claimed that the mass becomes thus absolutely compact and homogeneous, and capable of supporting the heaviest traffic.

THE Cargofleet Iron Company, Limited, have been boring for some time in search of ironstone between the Whitby and Skelton roads, near Guisborough. They have proved a good seam of ironstone of varying thickness up to 11 feet, and arrangements will shortly be commenced for sinking a shaft.

THE personal estate of the late Mr. John M'Andrew, iron-founder, Glasgow, has been returned at 229,482*l.*

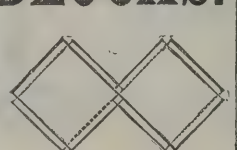
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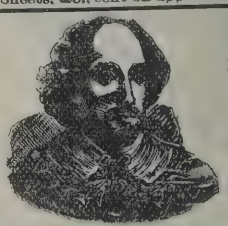
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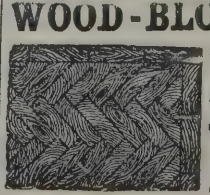
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A NEW well and pumps have been inaugurated at Kidderminster. The well is sunk to a depth of 105 feet, and below that is a boring of 12 inches in diameter for a depth of 272 feet, and below that a further 6-inch boring to a depth of 246 feet, making a total depth of 623 feet. A connection is made with the old well by a heading 30 feet in length, in which a 24-inch iron pipe has been fixed, and a sluice-valve fixed so that the wells can be cut off from each other if required. The new engine-house is of red stock bricks, laid with encaustic tiles, and the engines are of the horizontal compound surface-condensing class of thirty nominal horse-power. The water is raised to the surface by a lift-pump 18 inches in diameter, and having a 4-feet stroke. When working at its maximum speed, it will lift 814 gallons a minute.

AT the meeting of the Worcester Watch Committee, Mr. Swete, electrical engineer, reported that he had canvassed the citizens of Worcester on the question of electrical works being established. His canvass had proved that a satisfactory demand for electric light and power existed, in that out of only 388 circulars distributed he received 189 replies taking up arc incandescent lamps or motors equivalent to 13,660 incandescent lamps of 10-candle power. He had but little doubt that if the inquiry were extended an equivalent to 16,000 lamps would be wanted.

AT the meeting of the Wolverhampton Town Council the tender of Mr. H. Holloway, amounting to 423*l.*, was accepted for the making of Bone Mill Lane between Ruckley siding and the pumping-station.

THE new workhouse infirmary, Grantham, is being warmed and ventilated by means of Shorland's patent Manchester stoves and exhaust ventilating shafts, the same being supplied by Mr. E. H. Shorland, of Manchester.

ZION CHAPEL, Neate Street, Camberwell, which had become very much dilapidated, has been thoroughly repaired, redecorated, lighted and well ventilated. The work has been done by Mr. E. F. Wells, builder and decorator, of The Crescent, Southampton Street, Camberwell, Messrs. Kite's automatic inlet ventilators being used. The walls are painted with damp-proof paint. The cornice round the chapel has been picked out in tints, and a stencil border over the dado all round the walls giving the place a very bright and cheerful appearance. The building has been heated by Wright's patent hot-air stove. A series of entertainments, commencing 31st inst., will be given every Saturday evening during the winter months, the proceeds to go towards paying off the debt incurred by the renovation of the building. Messrs. Neighbour & Cauldwell will superintend the entertainments.

THE Aberdeen County Council have approved of a recommendation to construct a bridge of stone at a cost of 1,260*l.*, in preference to iron at a cost of 935*l.*, over the Ythan at Boat of Ardlethen.

BUILDING AND BUILDERS.

PLANS for the theatre proposed to be erected at Llandudno by the Pier Company were submitted at this week's meeting of the Improvement Commissioners and sanctioned.

IT is rumoured, the *Glasgow Herald* says, that the Hydropathic Buildings, Oban, which have been in a ruinous condition for a number of years, have been acquired by an English syndicate, who propose to complete the buildings and convert a portion into an hotel and the remainder into residential flats.

THE corner-stone of a new tower for St. Michael's Church, Waddesdon, Bucks, has been laid. The old tower was built in the twelfth century. About 1,200*l.* has been obtained towards the 3,000*l.* required to complete the new structure.

IT is proposed to extend the Hospital Buildings of the Edinburgh Royal Infirmary so as to provide accommodation for 200 additional beds. The cost of the extension is estimated at 73,500*l.*, plans for which have been prepared by Messrs. Sydney Mitchell & Wilson.

AT the meeting of the Saltley Local Board, Birmingham, it was reported that during the year from March last plans for the erection of 158 dwelling-houses, one new works and for six additions to works and premises already erected, had been passed.

AT the monthly meeting of the Wrexham Town Council it was resolved to improve the Smithfield by the erection of covered sheds, with concrete floors, at a cost of 1,350*l.*

FIVE tenders have been received for building the Avonmouth Police Station. The lowest, that of Mr. James Greenslade, of Stroud, amounting to 1,887*l.*, has been recommended for acceptance.

AT a meeting of the Glasgow Police Commission the Watching and Lighting Committee reported that they had remitted to the city engineer and the inspector of fires to prepare an estimate of the cost of proposed buildings for a fire station

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ANCASTER NEAR GRANTHAM

and for the accommodation of the lighting department on ground adjoining the Burgh Buildings at Maryhill. It was also recommended that new district fire stations should be erected on the site of the present police and fire stations, Old Keppechhill Road, and in the vicinity of Allison Street, Strathbungo.

PLANS for a new reception-house to be built at Clune Brae Foot, Port Glasgow, have been approved by the Dean of Guild Court. The reception-house consists of a one-storey building and attics, and has six rooms and kitchen. A separate building is to be erected, some yards apart, as a wash-house, with disinfecting-room. The buildings will be erected by Mr. Patrick Jamieson, at an estimated cost of about 700*l.*

THE Liverpool Dock Board have decided to spend about 152,000*l.* upon erecting several new sheds at the North-end, and a rubbish depôt and destructor at Hornby Branch Dock, the cost of the latter being estimated at 1,600*l.*

WITHOUT reflecting upon the faithfulness to duty of the Inspector of Buildings for the city of Toronto, it should be declared, the *Canadian Architect* says, that the inspection is a farce. Under present conditions it could be nothing else. During the present year the building restrictions which formerly applied only to the central districts have been extended so as to cover the whole city. Notwithstanding that the area covered by the by-law has thus been doubled, the building inspector is still expected single-handed to see that its provisions are complied with. Not only so, but he is saddled with other duties as well. The proper inspection of buildings in a large and rapidly-growing city like Toronto is in itself beyond the ability of a single individual to properly perform. As a result, the building by-law is being violated in all directions.

THE Emperor of Germany has inspected a model house in Berlin built by a company lately started for constructing dwellings for the working classes. His Majesty was so pleased with the dwelling in question that he ordered two such houses to be constructed for himself, which he will present to deserving workmen. These houses are small, self-contained, two-storey dwellings, and are let to workmen at a rent of 280 marks, or 14*l.* per annum. The payment of this sum, however, gradually enables the workman to become the owner of his dwelling.

IT has been decided to purchase for 450*l.* 3,200 square yards of land for the erection of a new police-station at Solihull.

AT Farnworth, during the demolition of the old Prestolee Chemical Works this week, one of the buildings collapsed, killing four men.

VARIETIES.

AT the last meeting of the Liverpool Health Committee for the present municipal year, Mr. J. B. Smith, the chairman, alluding to the engineer's department, said they had constructed during the year over three miles of impervious paving, and the total number of miles of this paving now was 101¼. Single-line tramways had been renewed for 794 yards; 3,584 yards of rail had been packed with liners which would make them last longer, and 318 yards of additional tram-lines had been laid. The sewers that had been constructed and reconstructed on the capital account were in length four miles, and there had been the usual work of cleaning and repairs. During the year 613 dwelling-houses had been erected. Under the Insanitary Property Act 215 houses had been demolished in the course of the year and other houses had been pulled down by the owners, but in regard to these the engineer had no record.

TWO memorial brasses have been uncovered in the south-east or Artists' Corner of the crypt of St. Paul's, to mark the place where Sir Edgar Boehm was recently buried. One is a massive and beautiful brass which covers the grave, and the other is fixed in the adjoining wall at the head of the tomb. The middle panel of the first brass contains a cross, with the name and date of birth, and the words, which were suggested by the Queen, "Died at his work."

THE restoration works at Crowland Abbey, which were suspended some time ago, are now again in active progress. Two of the arches which carry the steeple were in a most dangerous condition; these are being thoroughly restored. The beams which support the bell chamber have been found to be very much decayed and require under-beams to render them secure. The work of restoration was begun in 1888, and, although a great deal has been done, much more is required, including a new roof for the whole of that portion now used as a parish church.

THE Technical Instruction Committee of the Salford Town Council propose that application should be made to the Local Government Board for power to borrow 55,000*l.* for the purpose of the proposed technical school to be erected in Marlborough Square.

THE Coventry City Council have adopted a report by the General Works Sub-committee in reference to the sewage treatment and disposal difficulty, recommending that one or more competent engineers be consulted to examine as to the suit-

Awards—Gold Medal, Saltaire, 1887; Silver Medal, Brussels, 1888; Silver Medal, Paris, 1889; Gold Medal, Brighton, 1888.

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ability of land suggested; the works necessary for, and the cost of, a broad irrigation scheme; and generally to report upon the present system and works, and the manager's suggestions for enlargement and extensions.

New filters at Mill Glen Waterworks, Ardrossan, which have cost about 4,000*l.*, have just been opened. The contractor, Mr. Urquhart, of Glasgow, presented Provost Hogarth with a silver cup on the occasion.

At the meeting of the Lord Provost's Committee of the Aberdeen Town Council the question of providing public baths and wash-houses for the city was under consideration. It was agreed to instruct the town clerk to collect information as to the working of such institutions elsewhere.

The Sanitary Committee of the Wigan Town Council propose to borrow 15,000*l.* for the purpose of effecting sanitary improvements in the borough.

At a special meeting of the Newbury Corporation it was resolved that an engineer should be employed to advise as to which of three schemes submitted for the drainage of the borough should be adopted.

The portrait of Mr. Thomas Glenister, whose second year of office as Mayor of High Wycombe is drawing to a close, is given in the local *Standard* of the 23rd inst.

The *Indian Engineer* for September 26 has an article on Woodhouse & Rawson United, Limited, accompanied by a portrait of Mr. F. L. Rawson.

At a special meeting of the Town Council, Stoke-on-Trent, a resolution to promote a Bill in Parliament for powers to erect new gasworks to meet the future requirements of the borough was carried by eleven votes against six.

At the meeting of the Foleshill School Board the question of obtaining a loan for the erection of proposed new schools in Brick-kiln Lane was considered, and it was decided to accept 3,700*l.* from the Ecclesiastical Commissioners for fifty years, repayable by yearly instalments at 2*l.* 12*s.* 6*d.* per cent. interest per annum. It was further decided to hold a special meeting for the signing of the building contract.

A scheme is on foot for replacing the Queen's Ferry at Chester by a swing-bridge over the Dee. The estimated cost of a swing-bridge made of steel is 10,000*l.*, or, including approaches and contingent expenses, about 13,000*l.*

A paper on "Recent Practice in the Ironworking and Engineering Industries of the Cleveland and North-East Coast Districts," was read by Mr. Sidney H. Wells at the opening sessional meeting of the Yorkshire College Engineering Society, Leeds.

It has been decided to commence the construction of an underground lavatory on a first-class scale in Union Street, Aberdeen, being the first of a series to be constructed throughout the city.

At the quarterly meeting of the Warwickshire County Council, the following motion proposed by the Marquis of Hertford was agreed to unanimously:—"That this Council desires to express its deep sense of the loss sustained in the death of Mr. Francis Willmot, county surveyor, and its recognition of the able and satisfactory manner in which all his duties were performed."

It is proposed to affiliate the Dundee Institute of Architecture, Science and Art with the Royal Institute of British Architects. The membership of the Dundee Institute is likely to receive numerous accessions. Ladies interested in art are now also eligible as Associates.

During the municipal year the widening and straightening of the streets has been undertaken in Leeds to the extent of nearly 20,000*l.* of outlay. Under the head of street improvements no less than a score important thoroughfares are concerned. For the future it has been recommended that back streets shall be 18 feet wide, instead of 12 feet as before, and that the main streets shall extend for 14 yards or more from building to building, instead of 12 yards as at present. During the next municipal year the paving to be done will reach to a length of five miles, no less than eighty streets having been placed on the list for such treatment.

According to the *Pall Mall Gazette*, it is proposed to connect Waterloo Station with the City by means of a subway, on which electric trains would be run.

Complaints have been made that the London County Council, in repairing the carriage-way of the Thames Embankment, have, contrary to the custom hitherto, shut up the whole width of the thoroughfare, and thereby caused great inconvenience and congestion of traffic in Fleet Street and the Strand.

Another volume of the *Magazine of Art* is begun with the November number. The new features introduced for the first time are those of a frontispiece in colours ("A Breezy Day," by H. Detmold), and the monthly paper, entitled "Our Illustrated Note-Book," wherein subjects pictorial, architectural, sculp-

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tural, &c., are placed before the reader in a manner not hitherto attempted in the magazine, and by means of which the art movement of the day will be kept up to date by pictorial as well as by descriptive illustration.

THE Christmas number of the *Art Journal* consists of a life of the well-known artist, Briton Riviere, R.A. The blocks and paper are printed in the best style imaginable, and the full-page illustrations are *par excellence*.

THE fourth season of the "A.A." Lyric Club was inaugurated by a smoking concert held at the headquarters, Mona Hotel, Covent Garden, on the 23rd inst. The programme arranged by the president, Mr. A. C. Bulmer Booth, was most successfully carried out, Messrs. Booth, Hunter, Smith, Perks and Captain Watson contributing songs, and Messrs. F. T. W. Miller and Perks recitations. Mr. C. D. Imhoff again proved a most efficient accompanist. The next concert takes place on November 20, and will be arranged by Mr. Earle, who promises a performance by the "A.A." String Band and other special items.

"A ROYAL DIVORCE" at the New Olympic Theatre has proved so successful that the manager, Mr. W. W. Kelly, has renewed his tenancy of the said theatre, and been obliged to cancel the provincial tour he had already booked for Miss Grace Hawthorne. The cast of "A Royal Divorce" has been greatly strengthened by the special engagement of Mr. Hermann Vezin, who will appear as "Napoleon" on and after to-morrow, Saturday.

AMERICAN NOTES.

THE New York correspondent of the *Standard* says:—The basis of Mr. Villard's plans for introducing electricity as the motive power upon the Northern Pacific Railway is Mr. Edison's invention, which has hitherto been regarded only as adapted to tramways. Mr. Edison asserts that three stationary engines will be adequate to the traffic on the Pennsylvania Railway between New York and Philadelphia at whatever speed may be desired. He seriously proposes during the World's Fair to run trains, say, at twenty minute intervals, between Chicago and Milwaukee. Details are withheld, but it is known that Mr. Edison uses neither a trolley nor a storage battery, the currents passing over the rails, and safety being secured by a pressure so low as scarcely to produce an appreciable shock.

AT a meeting of the Manchester Association of Engineers, Mr. Hans Renold described a visit recently paid by him to some leading American workshops. He went to America, he said, with very high expectations as to the wonderful engineering work he would see, and he confessed that what he saw far surpassed his expectations. At a shop he visited in Boston, for example, he saw patent milling cutters being made at the rate of sixty-four per hour by a dozen men: 1*l.* spent in wages produced 30*l.* to 40*l.* worth of goods. Tools were stored in safes as carefully as if they were worth their weight in gold. He was much struck with the clean, healthy appearance of the men. He thought that perhaps one secret of the success of the machine trade in America was the extent to which specialisation was carried. Yet another reason was that in comparison with the Americans we were lacking in capital. There was money enough to be found in this country for a Canadian railway or for a South American railway, or for a gold mine which existed only in the imagination of the company promoter, but in Manchester, for example, it was impossible—he spoke from experience—for a man with some brains to raise 200*l.* or 300*l.* to work with. This was not as it should be. In America, as it seemed to him, engineers put their savings into their businesses, for the purpose of improving and extending them, to a greater extent than we did in this country.

IT has been arranged that a sum of about 2,000,000 dols. are to be devoted out of the estate of the late Mr. Tilden, for providing a library for New York, in accordance with the wishes of the deceased gentleman.

CHICAGO EXHIBITION NOTES.

PENNSYLVANIA'S exposition building will cost 75,000 dols.

INDIANA will have a 100,000-dol. building at the Fair. It will not cost that much, however, as a large share of the material, all of which will come from that State, will be donated.

SOUTH DAKOTA is raising 80,000 dols. for its representation at the exposition. It proposes to erect a building 144 feet square.

CONTRACTS for the construction of the Government's exposition building have been let to four firms—three in Chicago and one in Indianapolis—for different parts of the

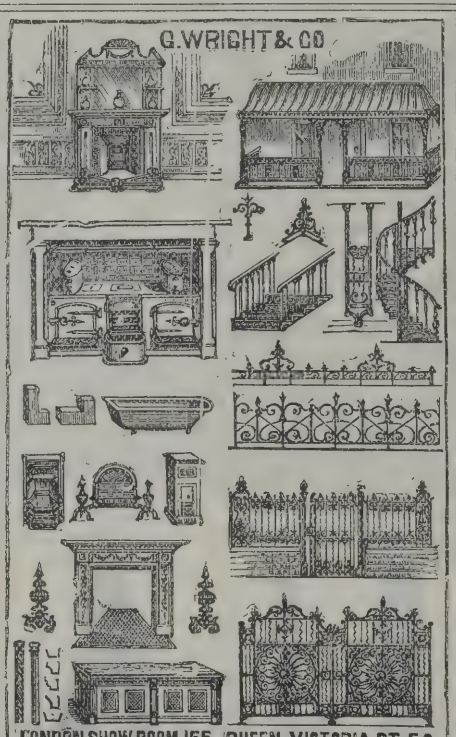
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Bradford Town Hall	Crawley Parish Church
St. James's Palace, London	Corbridge-on-Tyne Parish Church
Sherborne Abbey	Windermere Church
Sydney Town Hall, N.S.W.	Eiffel Tower, Paris
Durban Town Hall, S.A.	Royal Military Exhibition, &c., &c., &c.

GOLD MEDALS—HUDDERSFIELD, 1883; LONDON, 1885.
SILVER MEDAL—PARIS, 1889.

work. The aggregate amount of these contracts is 316,757 dols. which is less by 22,000 dols. than any single bid for the entire work.

The owners of one of the finest business corners in Chicago have decided to erect a 1,000,000-dol. sixteen-storey building, to be called "The Columbus," in honour of America's discoverer. The plans contemplate a structure strikingly artistic and ornate in appearance, of the Spanish style of architecture.

France has asked 25,000 and The Hague 11,000 square feet of space for their picture exhibits.

NEW CATALOGUES.

Church Furniture.—The catalogue of Messrs. West & Collier, of Hambleden, Henley-on-Thames, shows a fine assortment of church furniture, as manufactured by the firm in wood. It comprises fifty pages filled with illustrated designs of altars, lecterns, pulpits, litany desks, sedilias, choir and nave seats, church chairs, Glastonbury chairs, credence tables, altar crosses, &c. Attention is also given to the minor articles of church furniture, too numerous to mention, but among which are candlesticks, alms-boxes, collection-plates, &c., and umbrella stands. Exterior requirements are also dealt with, such as lych gates, churchyard gates, &c. The designs, Messrs. West & Collier wish it to be understood, in no way embrace the full extent and variety of their manufactures, and they will be pleased to forward other illustrations if purchasers will state the purpose for which the goods are required. More than enough, however, will be found in the catalogue to show the excellent style of work produced by Messrs. West & Collier.

We have received some price-list sheets issued by Mr. W. F. Stanley, of Great Turnstile, Holborn. Stanley's black drawing ink is well known in the offices of architects, engineers, surveyors, builders, &c. In manufacturing this the aim has been to produce a pure fluid black ink, entirely free from sediment, and an ink that should be perfectly permanent and unaffected by acids and alkalies. The drawing inks also include those in blue, red, green, orange and brown. Details also are given of Stanley's patent fluid professional colours, the use of which saves much time in colouring sections and details, and represent the materials to be employed—stone, brick, wood and metal. A time-saving appliance is "Gravet's Calculating Rule" for the use of architects, engineers, electricians, scientists, &c. Professor Fuller's Calculating Slide Rule is, it is stated, believed to be the simplest yet made to facilitate the numerous arithmetical calculations constantly required in office work. Stanley's "Treatise on Surveying and Levelling Instruments," written by the light of long experience, is for practical men more valuable than anything of the kind yet attempted, and has already been noticed in *The Architect*.

THE BREWERS' EXHIBITION.

A show, remarkable as well for its great variety as for the breadth of its interests, is now in progress at the Agricultural Hall, Islington, where is being held the thirteenth annual exhibition and market of the brewers and allied trades. No industrial exhibition at this hall has probably ever been so well attended, and as far as exhibitors are concerned, a great number, we hear, have had to be refused space, owing to all the available space being filled up at the outset.

The following firms, whose names we mention as likely to be of most interest to our readers, are exhibitors:—The Campbell Gas-Engine Company, of Halifax and London, varieties of gas-engines; Llewellins & James, brewers' engineers, Bristol, among other articles Day's patent gas-engine; Dan Rylands, Ltd., Barnsley and Manchester, glass tubing, which is invaluable in a sanitary sense, as a preventative of metallic contamination; C. Isler & Co., so well known for artesian bored tube wells, driven tube wells (supplied to the War Department), well-boring apparatus, Isler's patent registering turnstiles, &c.; Le Grand & Sutcliffe, their well-known artesian tube wells, pumps, driving apparatus (Norton's patent), boring tools, deep well pumps and registering turnstiles; F. Whitfield & Co., Birmingham and London, fire and thief resisting safes; H. Greene & Sons, gas engineers, Cannon Street, E.C., gas lamps, gas kitcheners, electric light fittings, general gasfittings and sundry novelties; James Stiff & Sons, Lambeth, stoneware bottles with tapholes and large stoneware screw stoppers; Sutcliffe, Wright & Son, Halifax, measuring and checking taps, measuring and recording (tell-tale) taps and "Empress" froth-pigs. William Bradford, architect and brewers' consulting engineer, Carlton Chambers, Regent Street, perspective drawings of breweries and maltings; Bradford's patent plastic malting floors; Bradford's patent cowl for malt kilns, &c.; E. S. Hindley, Bourton, Dorset, engineer, steam engines with and without boilers; Blackman Ventilating Company, Fore Street, E.C., the electric Blackman,

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THE MERSEY AQUEDUCT.

A REPORT has been prepared by the chairman and deputy-chairman of the Water Committee of the Liverpool Corporation upon the contract of Messrs. John Cochrane & Sons for the construction of the aqueduct tunnel under the Mersey. In consequence of the sad death of Mr. John Cochrane, an investigation into the affairs of the firm was necessary, and the result, so far as the contract with the Corporation is concerned, is exhaustively set forth in the report. The contractors undertook to construct the tunnel shafts and pipe-laying for 12,000*l.*, plus the cost of such castings and ironwork as might be necessary, over and above those taken over by the Corporation from Messrs. Monk & Newell. The estimated cost of these additional castings and ironwork was about 4,000*l.*, thus making the total cost of the works under the contract 16,000*l.* At the commencement of the contract the contractors deposited with the Corporation 1,500*l.* in lieu of providing sureties, and that sum was now in the hands of the Corporation. Up to September 24 last (the date of the last certificate granted by the engineer) the contractors, according to their own statement, had spent the following sums, viz.:—Plant and stores, 8,403*l.* 18*s.* 4*d.*; wages and salaries, 6,665*l.* 18*s.* 11*d.*—15,069*l.* 17*s.* 3*d.*; castings and ironwork, 3,158*l.* 3*s.* 7*d.*; total, 18,228*l.* 0*s* 10*d.* They had received under the engineer's certificates the following sums, viz.:—For work executed, 2,618*l.* 3*s.* 6*d.*; for castings, 1,685*l.* 4*s.* 3*d.*; total, 4,303*l.* 7*s.* 9*d.*; thus showing a sum of 13,924*l.* 13*s.* 1*d.* as the amount which they are out of pocket in expenditure on the works up to September 24 last. As a set-off against this loss is the retention money, amounting to 1,075*l.* 16*s.* 11*d.*; cost of castings on the ground, but not yet paid for under the certificates, 1,041*l.* 13*s.* 4*d.*; total, 2,117*l.* 10*s* 3*d.*; which, if paid to the contractors, would reduce their loss to 11,807*l.* 2*s.* 10*d.* The work done by the contractors comprises the Lancashire shaft and 185 feet of the tunnel, and on the Cheshire side the shaft had been sunk to the required depth. The work remaining to be done was the completion of the shafts and the driving and lining of 620 feet of the tunnel. The contractors have been relieved from their obligations under the present contract, and a new arrangement has been entered into whereby the contractor has assigned over to the Corporation the retention money of 1,075*l.* 16*s.* 11*d.*, the deposit of 1,500*l.*, and all plant, machinery and implements now on the works in which they have any interest. Although the chairman and deputy-chairman recommended that a new contract be entered into with the surviving partners of the firm of John Cochrane & Sons, the work will practically be done by the Corporation, who are retaining the staff of men now on the works. These men are to be under the constant supervision of Mr. Arthur Cochrane, who is to receive the sum of 5*l.* per week towards his personal expenses so long as he resides near the works. The work is to be completed under the directions of the engineer, Mr. Deacon.

THE LATE MR. GEORGE SIBLEY.

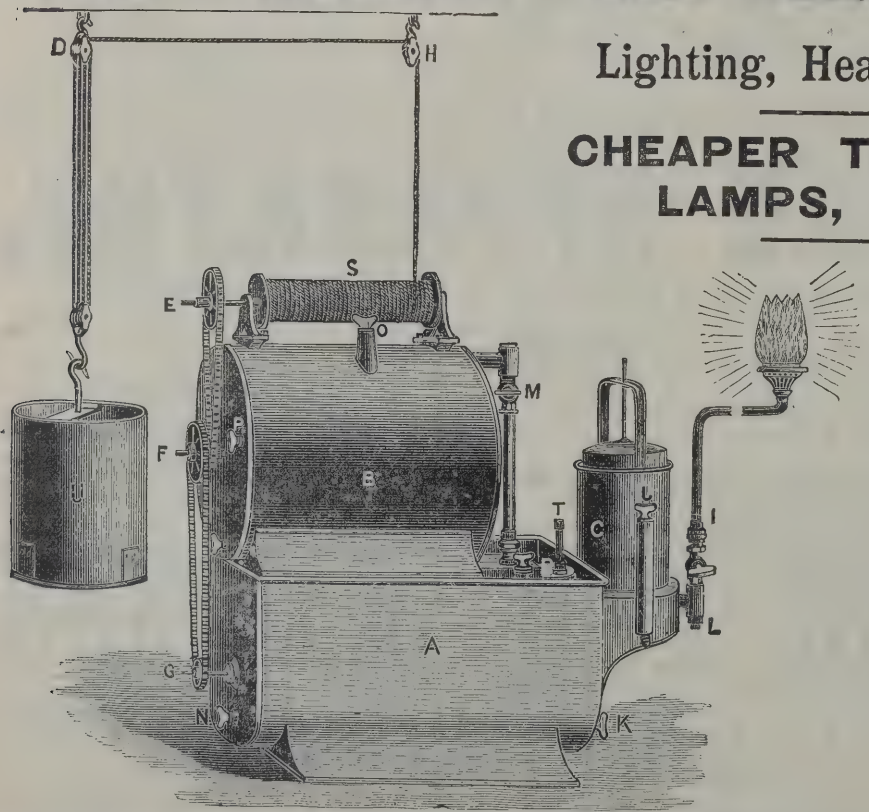
THE death is announced of Mr. George Sibley, C.I.E., Memb.Inst.C.E., F.R.G.S., on Sunday last, at his residence, The Mount, Whitehill, Caterham, at the age of sixty-seven. He was educated at University College School, London, from 1831 to 1836. On leaving school he served the usual period of apprenticeship with his father, who was an architect and civil engineer in London. In 1845 he was employed upon the Bristol and Exeter Railway, under Mr. Brunel, and afterwards under Sir Charles Hutton Gregory. In 1851 he went to India, and was engaged upon the East India Railway, under Mr. James Meadows Rendel. He gradually worked his way up, and in 1859 became the chief engineer of the North-Western Provinces Division, and in 1868 chief engineer of the whole line of 1,500 miles. He retired from the service and from the profession in January 1876. Among the more important works constructed under his supervision may be mentioned the Jumna Bridge, Allahabad, which was completed in 1866, and was, at

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that time, the largest bridge existing, being supported on fourteen piers, and having a railroad above and a carriage and footway beneath. Mr. Sibley was a great traveller, and there are but few parts of the world, even those remote and uncivilised, that he had not visited at some period or other in his life. He made various contributions to scientific, engineering and geographical journals, and it is understood that he has left a considerable legacy to the University of Calcutta for the purpose of founding engineering scholarships, and for other ways for the encouragement of native engineering students.

THE CHICAGO EXHIBITION, 1893.

THE following prospectus has been issued by the Royal Commission for the Chicago Exhibition—the Council of the Society for the Encouragement of Arts, Manufactures and Commerce :—

Under date of August 27, 1891, Her Majesty was pleased to issue a commission to the Council of the Society of Arts authorising them to act as Commissioners for the Universal Exhibition, which, pursuant to an Act of Congress, and in accordance with a proclamation made by the President of the United States of America, will be held at Chicago from May 1 to October 30, 1893.

The Royal Commission are now prepared to receive applications from artists, manufacturers and others desirous of taking part in the exhibition, to afford them all necessary information, and to offer them all available facilities which they may desire for this purpose.

Such applications must be made upon forms to be obtained from the secretary of the Commission, at their offices, Society of Arts, John Street, Adelphi, London, W.C. They must be sent in, properly filled up, not later than February 29, 1892, and addressed to the secretary as above.

As the funds granted by Her Majesty's Government will not suffice to defray all the expenses of the section, it is necessary that they should be supplemented by payments from the exhibitors. A charge will therefore be made to each exhibitor, based on the amount of space occupied, and calculated on the following scale :—For spaces not exceeding 100 square feet, 5*s.* per square foot ; for spaces exceeding 100 square feet and not exceeding 200 square feet, 4*s.* 6*d.* per square foot ; for spaces exceeding 200 square feet and not exceeding 300 square feet, 4*s.* per square foot ; for spaces exceeding 300 square feet and not exceeding 500 square feet, 3*s.* 6*d.* per square foot ; for spaces exceeding 500 square feet and not exceeding 750 square feet, 3*s.* per square foot ; for spaces exceeding 750 square feet and upwards, 2*s.* 6*d.* per square foot. The minimum charge will be 5*l.*

It is not expected that the total receipts from all sources will more than suffice to defray the cost of an adequate representation of British industry ; but should there be a sufficient surplus after the payment of all the costs of the section, the Royal Commission will refund the balance *pro ratâ* with the amounts contributed by the several exhibitors. The amount produced by the payments of exhibitors will therefore be treated as a guarantee fund, to be expended if necessary, but if not, to be refunded to the contributors.

The exhibition is situated in Jackson Park, within the southern limits of the city of Chicago. The principal buildings are devoted to the following main divisions :—(1) Fine arts ; (2) manufactures and liberal arts ; (3) agriculture ; (4) machinery ; (5) electricity ; (6) mines ; (7) transportation ; (8) horticulture. In all these space has been allotted to Great Britain, though it is expected that the principal British court will be that in the building of manufactures and liberal arts, since the privilege has been conceded to this country of massing all or most of its exhibits together, should such a course prove desirable.

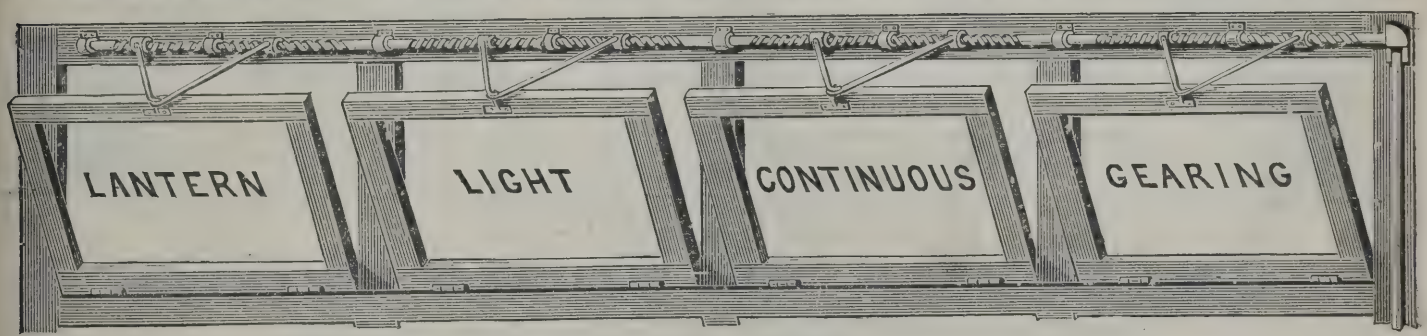
Exhibitors' goods will be transmitted direct in bond to Chicago, where the usual Customs examination will be made. Goods for exhibition only will not be liable to duty, but on goods sold the usual rates will have to be paid. Goods can be sold in bond, at prices independent of tariff, the duties being payable by the purchaser.

The American railroad companies propose to carry goods back from the exhibition free, charging the usual rates for the outgoing journey. These rates, it may be noted, are low in comparison with those usual in European countries. It is hoped that special terms for exhibition goods traffic may be obtained from the Atlantic steamship companies. Full information as to routes, traffic, rates, &c., will be provided in due course.

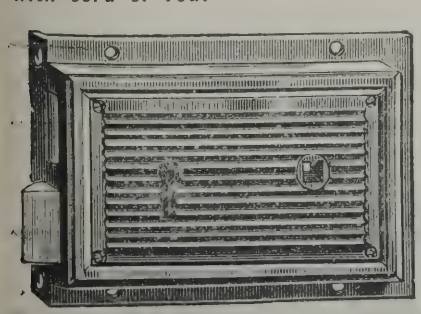
A general official catalogue will be published in English, French, German and Spanish. A special catalogue will also be published for the British section.

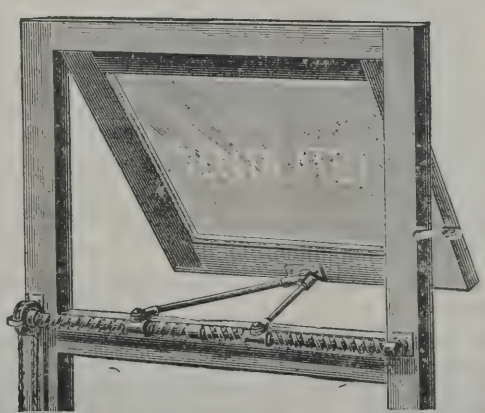
Exhibitions of live-stock will be held, and prizes will be offered in connection with them. A special circular has been issued giving information about these.

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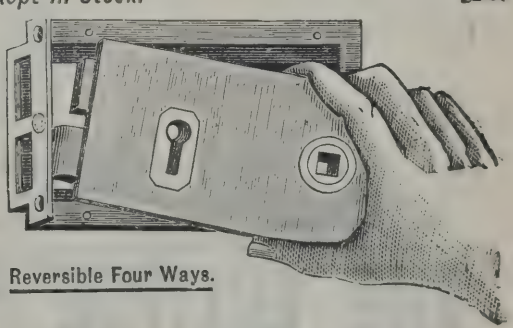




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A limited quantity of steam and water-power will be supplied gratuitously. Further supplies will be provided at a fixed rate. Counter-shafts, pulleys, belts, &c., must be provided by the exhibitor. Application for motive-power must be made on special forms which will be supplied on demand.

The general reception of articles at the exhibition buildings will commence on November 1, 1892, and no articles will be admitted after April 10, 1893. Foundations for heavy machinery may be put in and special constructive work commenced as soon as the state of the ground and the buildings permits.

Special regulations will be hereafter issued for the organisation of the international juries.

The Royal Commission are informed that the contract labour laws of the United States will not prevent exhibitors from importing foreign labour or from entering into binding contracts with their employés. Further information on this head will be supplied on application.

Every person who becomes an exhibitor in the British Section thereby agrees to be governed by the rules and regulations laid down by the Exhibition Executive, or by the Royal Commission through its executive officer.

SANITARY APPLIANCES.

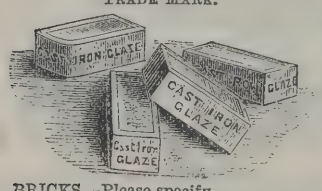
THE public are indebted to Mr. John Jones, of Sydney Street, Chelsea, for many valuable sanitary appliances. Mr. Jones is a native of Machynlleth, North Wales, and from early years appears to have had a natural turn for sanitary engineering, which has been still more developed by study and also long experience in the practice of sanitary engineering. Being gifted with the powers of invention and the ability to work out his ideas into practical shape in the readiest and most direct way, these qualifications alone would have caused him to be ranked as an authority in this branch of scientific work. But in addition, his varied experience in matters concerning house drainage and ventilation has been largely called in request by distinguished clients in London and the country generally. The value has been recognised of the new sanitary appliances devised by Mr. Jones, besides the improvements he has introduced in what may be called existing appliances. The manhole cover is one example in which natural laws are utilised to obtain perfect results without resorting to complicated devices. The frame is made with upper and lower channels or grooves. The lower or inside cover is arched. The moisture from the drains condenses on the inside of this cover, and trickles down the sides into the channels which carry the cover, and thus produces a water seal by automatic action, and consequently no filling of any kind is required in the channels. A second seal is provided by the grooves that receive the upper lid, which may be filled with any suitable material.

A simple and effective contrivance is the patent drain-pipe stopper designed by Mr. Jones for applying the water test to drains, or arresting the flow when they are under repair. A bag of indiarubber, or like material, has attached to it a flexible tube, with a tap at the end that is connected with a small hand pump. The bag is placed in the drain-pipe, and then quickly inflated by use of the hand pump till the pipe is closed against the escape of water, air, or gas. The bag is easily removed by turning the tap, which allows the confined air to escape.

Mr. Jones has an unfailing cure for smoky chimneys in his specially-constructed patent chimney-pot; at least his experience is that he has not yet failed to cure a smoky chimney where he has fixed his patent. It is made with two exhaust chambers that have no outlet whatever from the outside, except the indispensable top outlet. In practice the wind, if it enters here, is spent before it can interfere with the rising smoke. The rotary exhaust ventilator and the fixed cowl or ventilator both contain features that are original in addition to those common to other kinds of ventilators. The advantages claimed are "a cowl or ventilator with external wings for revolving it, with internal wings or vanes for propelling the air or gases through it—the one action assisting the other—and an entire cylinder between the two, whereby the current of air operating upon the external wings is prevented from interfering with the current of air or gases passing through the interior, and the circular or bulb portion at the lower point providing an exhaust chamber should wind enter from the top and so prevent its proceeding further into the chimney." It can be further arranged to prevent the entry of snow or hail, and also it can be used for the introduction of fresh air into a building as well as for exhausting vitiated air. In the case of the cowls and ventilators natural laws are relied on to produce efficiency.

The ventilation of sewers in connection with house-drains is effectively secured by combining the use of the patent manhole-cover with other inventions carried out on the same principle, of attaining the best results with the least amount of complexity possible.

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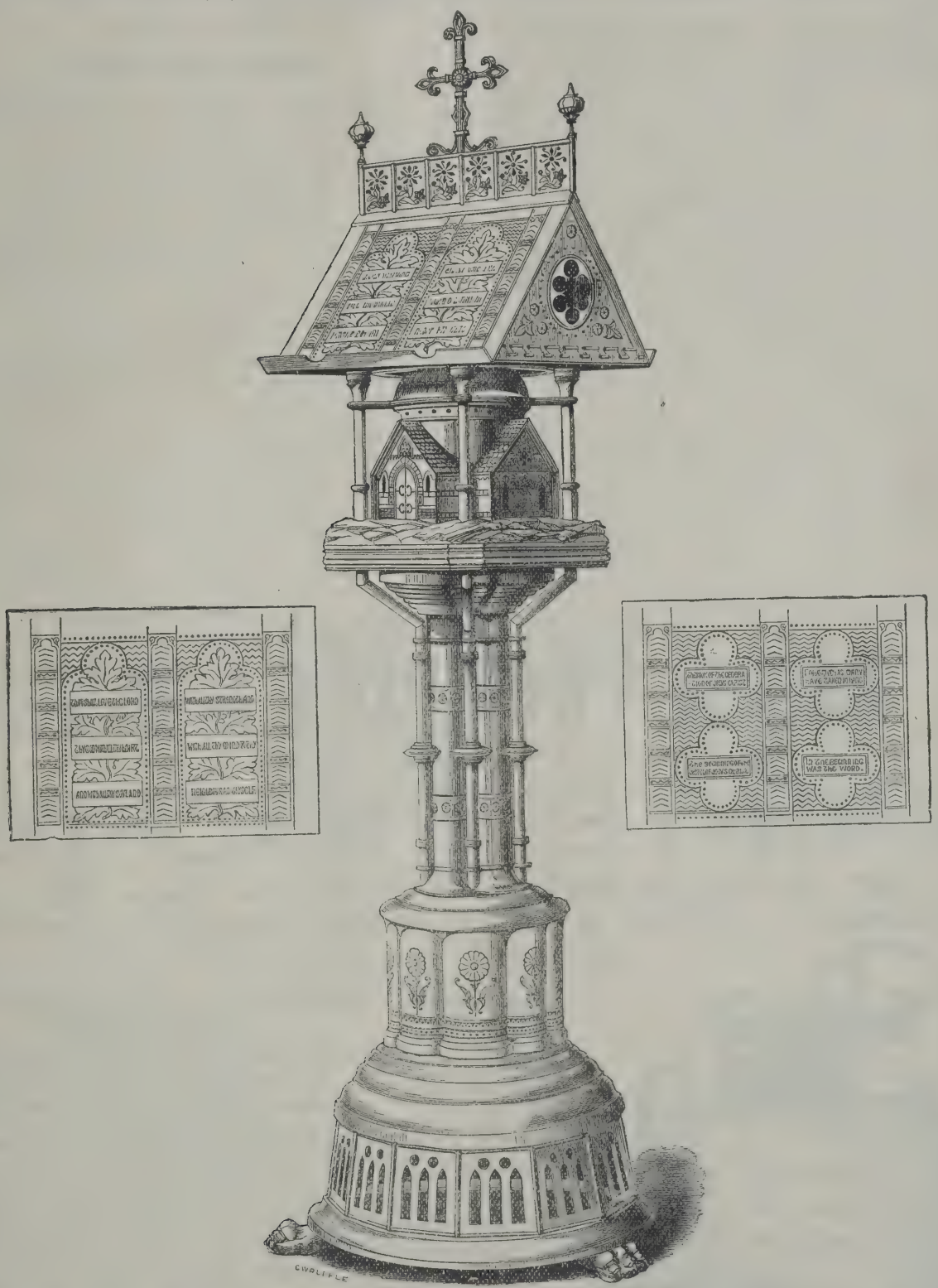
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ART METAL WORK.

This lectern was designed by the late Mr. E. J. Tarver, architect, for Messrs. Richardson, Ellson & Co., art metal-workers, by whom the work has been executed in their best style. The idea embodied is that of "The Church founded upon a Rock." The base of the lectern is massive and bold. It is of polished brass, with pierced panels of polished copper, and is supported by four large claw-feet. Above this the stem assumes the form of a curved octagon, each face of which is nicely engraved. It is of polished brass, and is immediately surmounted by a shaft of polished copper, also handsomely engraved. Around are four ornamental brass pillars, which run up to and form a support for the brass rockwork, upon which is planted the Church surmounted by a dome. Immediately above, and revolving, are the book boards of polished brass beautifully engraved with sentences from the Gospels. The whole design is unique and the workmanship of the highest order, and to anyone desirous of possessing a worthy memento of the late talented designer, or of making a suitable present to a deserving church, a favourable opportunity is afforded of obtaining a really handsome lectern, and one out of the common order. The lectern, which is suitable for a cathedral or large church, may be seen at any time (and inspection is invited) at the show-rooms of Messrs. Richardson, Ellson & Co., 17 and 18 Brownlow Street, Holborn, W.C. The price is 130*l.*



THE WATKIN TOWER.

The directors of the Tower Company, Limited, of which Sir Edward Watkin, M.P., is chairman, and whose capital of 70,000*l.* was privately subscribed by certain shareholders in the Metropolitan Railway Company, have entered into an agreement to lease about 124 acres of the Wembley Park estate, together with the now almost completed foundations of the proposed tower. The agreement for the lease, which was signed last week, is for a term of 999 years at a rental of 2,000*l.* a year from October 21, 1892, in addition to one-fourth of the annual profits after the lessees have received a dividend of 15 per cent. per annum. This lease has been taken by a newly-formed company, of which Sir Edward Watkin, M.P., is also chairman, and whose proposed capital of 200,000*l.* will be wholly devoted to the erection of the structure of the Tower, above the levels of the foundations.

REGISTRATION OF PLUMBERS.

A PUBLIC meeting has been held in the Town Hall, Belfast, under the auspices of the Ulster District Council for the National Registration of Plumbers, for the purpose of hearing an address by the Clerk of the Plumbers' Company, London, on the draft of a Bill to give legal effect to the system of registering plumbers. In the unavoidable absence of the Mayor the chair was occupied by Mr. Wm. M'Cammond, J.P., and there was a very large attendance of representatives of the trade and the public, including Dr. Whitaker, consulting sanitary officer of health, Professor Fitzgerald, Mr. J. J. Philips, architect, Mr. P. C. Cowan, C.E., Mr. W. J. Gilliland, C.E., chairman of the Registration Committee, Mr. Richard Patterson, J.P., &c.

The Clerk of the Plumbers' Company gave a short account of the steps which had led up to the Bill which he was about to explain to the meeting, and he stated that one fact alone would convince them of the necessity for such a Bill, and that was that it had been estimated upon very competent medical authority that fully one-third of the preventable disease and deaths in the United Kingdom was directly due to defective drainage. Another point he wished to direct attention to was that, although the most recent legislative enactment dealing with sanitation, the Public Health (London) Act, passed in the last session of Parliament, embodied a great number of provisions relating to plumbers' work, not a single clause in that Act, or any other of the existing Acts, relate to the qualification of the men who had to carry out that work, the plumbers. Coming to the Bill itself, the speaker wished to point out that it was what was called an Enabling Act. It was not a compulsory or coercive measure. It proposed to create a general Council of competent jurisdiction and authority, to be made up of members of the various provincial organisations that were now concerned in carrying forward the movement, with the addition of representatives from some of the architectural and educational bodies and some medical bodies, whose aims were such that their representation upon the Council would be likely to further their common interests. Then the Bill contained provisions for regulating the qualification of those entitled to use the title Registered Plumber. It also provided for a competent Board of Examiners, and the keeping of a legal register. The Bill further provided for due inquiry into complaints against registered men, and, in cases of default, for striking names off the register. The Bill made it a penal offence for anyone to personate a Registered Plumber. After full discussion the following resolutions were passed :—

"That this meeting is of opinion that an efficient system of registration of plumbers is essential to the protection of the health of the community, and such a system having been established by the Worshipful Company of Plumbers, London, we believe the time has arrived when application should be made to Parliament for powers enabling a national Council of competent jurisdiction and authority to take measures for promoting the technical education of plumbers and regulating the practice of those registered."

"That this meeting, having considered the Bill promoted by the Worshipful Company of Plumbers, hereby express their general approval of the principles of the same, and resolve to give it their hearty support."

LONDON WATER SUPPLY.

THE County Purposes Committee of the Corporation of the City of London have prepared a report of their proceedings under the references in relation to the water supply. The committee regret that their Bill was rejected, as it provided *inter alia* for immediately and efficiently carrying out every necessary inquiry, instead of remitting the question to an uncertain future. It is, however, a matter of satisfaction to them to notice that the proposed joint action of the Corporation and the County Council met with as much favour at the hands of the Select Committee as it had with the bodies themselves and the very large public they represent. If the supply of water to the metropolis is to be transferred from private enterprise to municipal control, what course is to be adopted? In all the larger towns the course adopted had been the purchase of the existing supply, and when that had proved inadequate, the addition of a supplemental supply. The committee therefore recommend that the necessary steps be taken to introduce a Bill next session to give statutory powers to the joint committee of the Corporation and the London County Council; to authorise that committee to give notices to treat to the metropolitan water companies within four years and to make the giving of such notices obligatory at the expiry of that period; to constitute a tribunal to ascertain the price to be paid, and to clothe such tribunal with the fullest powers of inquiring into and deciding upon all such questions as it might consider necessary with a view to purchase; to enable the tribunal to

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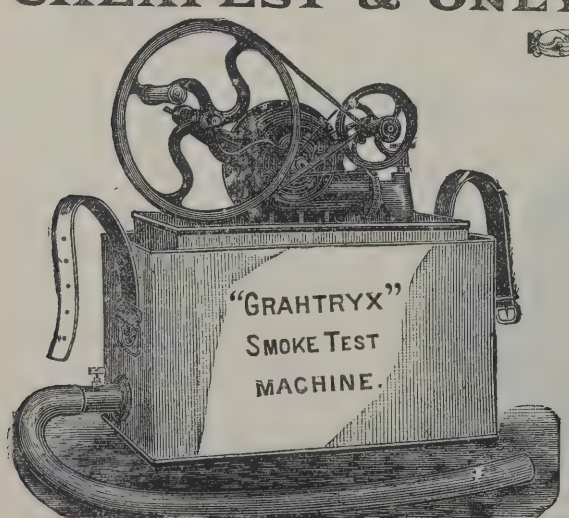
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"In reply to your inquiry, I have to state that I have had the Smoke Machine in daily use for over six months (on about 200 different occasions), and have found it very satisfactory, both as regards efficiency and handiness. "GILBERT THOMSON, M.A., C.E."

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decide as to the purchase by local authorities outside London of the works of distribution within their district; and also to decide as to the supply of water in bulk to such outside authorities, and to pay for the undertakings by stock having the ultimate security of the county rate.

THE PRESERVATION OF IRON AND STEEL STRUCTURAL WORK.*

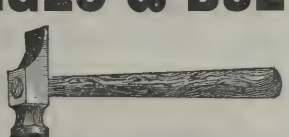
ONE of the most important economic questions of the present day is the preservation of iron and steel structures. In America many millions of dollars are annually spent in the erection and construction of these, and the amount is increasing in rapid proportion. Bridges, buildings, viaducts, ships and machinery are now being made of these materials to almost the entire exclusion of others. From their very nature iron and steel are peculiarly subject to decay from atmospheric and other influences. The question of preserving them is not merely one of dollars and cents, but, especially in the case of railroads, one affecting the lives and property of a large portion of the community. What, then, is the best method of preserving them?

The almost universal method is by means of paints, or the application of substances to their surface which will resist or retard the influence of air, water and other destructive agencies. The requisites of a good paint for this purpose are that it shall adhere firmly to the surface and not chip or peel off, thereby leaving portions of the surface exposed. It must not corrode the iron, else the remedy may only aggravate the disease. It must form a surface hard enough to resist influences which would remove it by friction, yet elastic enough to conform to the expansion and contraction of the metal by heat and cold. It must be impervious to and unaffected, as far as possible, by moisture, atmospheric and other influences to which the structure may be exposed.

The paints that have been used for this purpose are principally asphalte and coal-tar paints, consisting of mineral and artificial asphalte or coal-tar either applied alone or combined with each other, and, more or less, with metallic bases, and iron oxide paints and lead oxide paints, especially red lead, in all of which the pigment is held to the surface of the iron or steel by combination with linseed oil. The choice of paints must lie, so far as our present practical experience goes, between these three classes, zinc oxide being found to be entirely unsuitable on account of a propensity to peel off. What, then, is found to be the experience in actual practice with these? Asphalte and coal-tar paints run when exposed to the sun and other sources of heat, which is a serious matter with vertical surfaces, and after a time become extremely brittle and scale off entirely, leaving the under surface exposed unless the paint is constantly renewed. In the meantime the exposed iron and steel are being corroded by rust. Iron oxide paints, including "metallic brown," are paints made from iron ore, or by some chemical process with an iron base. These are invariably iron in a greater or less degree of oxidation, or, in other words, rusted iron. Now it is well known that one of the most active promoters of rust or decay in iron is the rust itself. Under the combined influences of the moisture and carbonic acid of the atmosphere iron oxide or iron rust becomes a carrier of oxygen from the air to the metal, rust begetting rust. It is therefore evident that this material alone has no preserving effect on iron; in fact it promotes its decay.

How is it when combined with linseed oil in the form of paint? In the economy of nature iron oxide is a great disinfectant. When in contact with organic matter and moisture, even at a low temperature, under favourable conditions it readily gives up oxygen, destroying more or less the organic matter, and being itself reduced to a lower oxide. When thus reduced, with equal readiness it absorbs oxygen from the atmosphere, and again passes it on, thereby promoting and eventually insuring the destruction or transformation of the organic matter with which it may be in contact either in the soil or elsewhere. The same process appears to take place when combined with linseed oil in the form of paint and exposed to atmospheric influences, the oil being the organic matter. If linseed oil in drying formed an air and waterproof film it might be urged that the oxide of iron would be entirely protected from the direct influences of oxygen of the air and moisture. Such, however, is not the case. The most eminent authorities have recently shown that the dried film of linseed oil, unless united with a pigment that combines chemically and forms a waterproof coating with it, actually absorbs water very much like a sponge. Where water will go, air will also go, and we thus have in direct contact with the iron oxide of the paint, which does not combine chemically with oil, those elements air, moisture and organic matter, which cause the iron to become a

* A paper by Mr. Woodruff Jones in the *American Railroad and Engineering Journal*.

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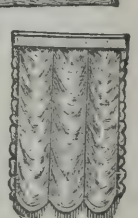
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carrier of oxygen and a destroyer of what it is in contact with. It is well known that iron paint darkens with age; this is caused largely by the iron oxide losing oxygen, which is partly transferred to the oil, burning it up and destroying its tenacity, as may be seen by examining iron structures painted for some time with iron paint or metallic brown, the paint being found extremely brittle and in feathery scales. This is not all the damage that is done. The iron oxide in the paint becomes a carrier of oxygen to the very metal it was designed to protect, and the process of corrosion is commenced and carried on under the paint, which eventually peels or scales off, the surface of the metal being found more or less oxidised and corroded.

Asphalte and iron oxide being thus shown to be entirely incapable of preserving the iron, it remains for us to consider the effect of red lead. This pigment has the property of forming with linseed oil a hard elastic coating, clinging with great tenacity to the metal. It has no oxidising effect on iron and does not act as a carrier of oxygen from the atmosphere after the paint has set, neither does it render the oil brittle nor promote rust. When red lead fails it is principally by gradual wear or friction from the outside. It does not scale or blister, which both asphalte and iron oxide paints will do, thereby requiring a thorough scraping and removal of old material before a new coat can be applied. Any red lead pigment adhering to the metal forms a permanent base for subsequent paintings and is utilised in further preserving the metal. The Government specifications for ironwork in the new Library Building of Congress provide that "all the work not Bower-Barffed must be given one coat of pure red lead paint—not metallic paint of any kind, but pure red lead—before leaving the shop and before becoming rusted."

The experiments of the Navy Department on the preservation and fouling of plates covered with different pigments may be interesting. A plate of iron covered with asphalte paint was immersed in sea-water for eight months and six days at the United States Navy Yard, Portsmouth, N.H. At the end of that period it was found to be covered with scum and mud, and very badly rusted. A plate coated with iron paint immersed at Key West, Fla., was found to be covered with branch shell and coral, but little paint remaining, and very badly pitted and rusted. A plate with two coats of red lead, at the Norfolk Navy Yard, was found to have a few barnacles attached, but to be in fair condition, with no rust whatever on the iron after the paint was removed. It will be seen that not only did the red lead protect the iron better than the other pigments referred to, but that the plates were in far better condition as regards barnacles and fouling. The superiority of red lead being thus established, it is adopted for use on hulls of Government warships.

On the Dutch State railroads a series of experiments extending over a period of three years were made with the above pigments on scrubbed plates, as well as those which had been pickled in acid to remove the scale. It was found that the red lead was superior in each case to the others.

If red lead is thus proved to be the best pigment for preserving iron and steel structures, what is the proper method for applying it? We have seen above that the value of red lead depends upon its forming certain combinations with the oil and actually setting very much the same as plaster of Paris or cement sets when mixed with water. To successfully work with the latter substance, it is necessary to put them in shape as quickly as possible after mixing with water before the setting takes place. If the chemical action of setting has partly taken the place the material may be moulded, but it is well known that good results will not be obtained. Red lead, like these substances, must be applied to the work before it sets with the oil. It is on this point that failures in the use of the pigment have generally occurred, because if it be applied after the combining or setting process has taken place, the hard, elastic, clinging coating will not be formed on the iron surface.

The following is the practice of one of our largest shipbuilding establishments in applying red lead to the hulls of Government vessels. The plates are first pickled in a dilute solution of muriatic acid, then passed through rapidly-revolving wire brushes, which remove all scale and dirt, leaving the iron with a bright, smooth surface, then thoroughly washed with pure water and rubbed entirely dry and immediately coated with red lead and pure raw linseed oil. The red lead is first thoroughly mixed with just enough linseed oil to form a very thick, tough paste, which will keep for several days without hardening. This paste as wanted for use is thinned down to the proper consistency for spreading with pure linseed oil, and applied at once, care being taken to leave paint-pots empty at night. A gallon of paint thus prepared contains about 5 lbs. of oil and 18 lbs. of red lead, and will cover on first coat about 500 square feet. In this way the red lead and oil get their initial set on the surface of the iron, and the closer the pigment is brought to the iron the more durable will it be found. Some parties prime iron with iron oxide paint or metallic brown before applying red lead, which I believe to be a mistake, as this paint

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readily scales from iron and, of course, carries the lead with it. Others coat the iron with oil before applying the red lead; this, too, prevents the adhering paint from coming in contact directly with the surface, and should be avoided, provided the iron is properly prepared by thorough cleaning and removal of any scale and moisture, which is a matter of the greatest importance. In priming wood surfaces which are absorbent of oil, the best practice favours the putting on of a coat of pure oil, or oil thinned with turpentine, which shall penetrate the surface and form a binder for the subsequent coats. With iron the case is quite different, provided we have a paint which, from its very nature, can attach itself firmly to the surface, because it is out of the question for it to hold on to the surface of iron by any process of absorption into the pores of the metal, as linseed oil will not penetrate to any extent. Such a paint should be put directly on the surface of the clean, dry metal—as is done in the cases of Government vessels referred to—without the intervention of a coat of oil or other substances.

The rusting of iron before the application of paint, which is sometimes recommended, should by all means be avoided, as it not only prevents the contact of the paint with the metal, but induces a chemical action which may go on with its corroding work under the applied paint.

As to the relative cost of iron oxide paints and red lead, there is no doubt that the first cost of painting structures with iron oxide is somewhat less than with red lead. The best railroad authorities state, however, that labour in painting structural work costs twice as much as material. The true economy must therefore be sought in the durability of the paint as well as the preservation of the structure from rust. Actual experiments have shown that structures painted with iron paint had to be repainted the third or fourth year, those with red lead not until the sixth year. In the second painting with iron paint the old material must be entirely removed before a fresh coat can be properly applied, entailing considerable increased cost, whereas with the red lead no such expense is necessary, but, as before stated, a portion of the pigment remains on the iron, continuing to protect the surface, and is the very best base for the new coat, besides contributing materially toward it, lessening the expense of each repainting. It will therefore be easily seen that, although in first cost red lead may be slightly dearer than the iron paint, yet in the long run it will be greatly cheaper, besides giving assurance, for the reasons above stated, that the structure is not deteriorating from the effects of the atmosphere and paint.

Before closing this article it might be well to allude to the effect of lampblack when mixed in small quantities, say an ounce to the pound of red lead. It changes the colour to a deep chocolate, a possible advantage in some cases, and also prevents the red lead from taking its initial set with linseed oil as quickly as when mixed with oil alone. Experiments recently made showed that this compound would remain mixed in paste form with linseed oil some thirty days without hardening. Thorough mixture is of the greatest importance, and should be done in the dry state before adding the oil. If rapid drying is desired, Japan dryer can be mixed with the oil used in thinning the paste before application with the brush.

Too much stress cannot be laid on the great importance of having the metallic surface perfectly clean and as free as possible from scale and rust before the application of the paint. Where pickling with acid is impracticable, as is frequently the case in railroad and other structural work, thorough brushing with wire brushes should be resorted to.

THE RIVIERA.

THE winter stations of the Mediterranean littoral, says a correspondent of the *Times*, are being cleared of the accumulations of summer-dust, and their bright habitations reopened for the reception of the stranger, who constitutes so profitable a source of revenue. There are all the evidences of a very busy season in store for the Riviera—the prospect, indeed, has not been so bright since the time of the earthquake. An extraordinary amount of activity is being displayed in the matter of new buildings and improvements all along the coast. Even at this early period villas and apartments are in great demand—much greater than has been the case for many seasons past. The consequence, in Nice at any rate, is a general rise in rents of from 25 to 50 per cent. Naturally this extra expenditure on the part of the tenants will recur later upon the foreign visitors. Last year the prices asked for villas and suites of rooms were quite high enough, and it is necessary to give a warning note that further advances may result in retaliation on the part of the stranger. Already he pays dearly for his sunshine and blue sky, if these are the things he seeks, or for his festive gaiety, if he journeys southward for that alone. Nice brought disaster upon herself seven or eight years ago by wanton speculation and extravagant charges to her

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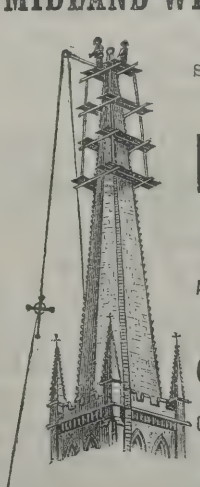
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guests. It is but a friendly act to point to the danger which is again appearing ahead.

Regret must be expressed that the Nice municipality has not yet completed its drainage system by carrying the sewage far out to sea instead of allowing it to run into the Mediterranean just under one's nose as one walks the otherwise charming Promenade des Anglais. The action of the authorities in this matter is quite typical of the easy-going southern methods of making sanitary improvements. Last summer the necessary pipes for conveying the sewage into deep water were brought down to the beach, and just as the season opened a few of them were laid down. Then the visitors began to arrive, and, as it was considered to be of much more importance not to have the promenade upset during the season than to complete the work, its continuation was postponed until this summer. But a storm came and washed up the pipes, and broke others left lying about. Now they have all been carted away again, and the obnoxious streams flow on as before to meet the blue waters of the tideless sea just where they lap on the shingle at the beach. The system of drainage in Nice is in itself fairly good for a southern town; there is a splendid supply of water for flushing the sewers, if only a more liberal use were made of it. The British Consul in Nice has drawn attention to this matter time after time, and he has given the municipality full credit for all that it has done. After this, however, a strong protest must be made on behalf of those who come here for their health's sake against this further postponement of a most necessary piece of sanitary work. As I shall presently show, Nice is now far behind all her neighbours upon the French Riviera in this matter of the proper disposal of the sewage of the town.

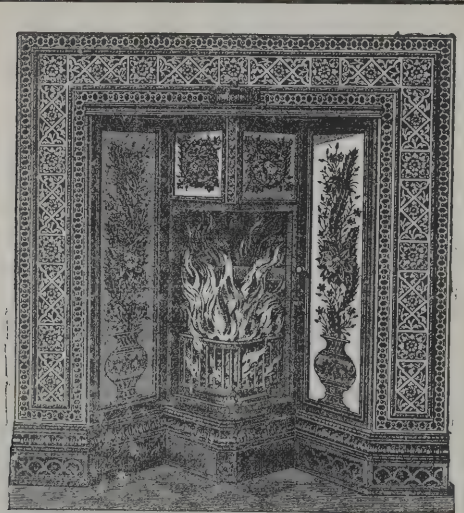
Cannes, on the other hand, has been exceedingly busy during the past summer in carrying out sanitary and other improvements. After consultation with eminent engineers, English amongst them, an efficient drainage scheme is approaching completion. Pipes, after the Hulton principle, are now laid throughout the town at such a depth as to enable the inhabitants to connect their dwellings easily. The collecting sewer is carried far out into deep water behind the port, and in a year or two it is to be taken to a point on the coast some miles away. The drains are supplied with automatic *chasses d'eau*, and, as there is an abundant supply of water from the Siagne Canal, they can be flushed several times a day. This work has been accomplished by the municipal engineer, M. Ferrand. He has further carried out considerable improvements in the driving roads round Cannes, especially in the east and west quarters of the villa proprietors. Electric lighting has also been introduced, and the residents are taking up the scheme readily.

The Boulevard de la Croisette in Cannes has hitherto presented a most dilapidated front, all attempts to keep an embankment intact against the action of the waves having failed. Another plan, one of conciliation with *la belle mer*, is to be tried. In place of the rigid sea-wall, groynes of masonry are being run out at right angles with the promenade, and sloping gently towards the water. The sand will be gradually silted up against them until the boulevard will have a long sloping beach, far more attractive to the eye than the existing walk, and one capable of combating all the ill-humours of the Mediterranean.

Other projects in Cannes for which the necessary money votes have been secured are the improvement of the port and the building of a new post and telegraph office. For years English yachtsmen have been agitating the former proposal through their Vice-Consul, and the great influence of the Prince of Wales was enlisted in order to obtain from the French Government the necessary grants to make a safe anchorage for small craft in the harbour of Cannes. The existing breakwater is altogether inadequate to stop the force of the waves when the usually peaceful Mediterranean is stirred up by the Mistral or when the occasional storms of spring-time are raging. It is therefore proposed to extend the sea-wall by 200 mètres. Then it will constitute an effectual shield for the frailer yachts frequenting the Riviera ports which are now obliged to seek shelter at Nice or Antibes. The existing post and telegraph office, dark, inconvenient and always dirty, is a disgrace to a town of the pretensions of Cannes. The necessary site has been, however, acquired for the new building, the streets in the vicinity are being opened up, and the work will be proceeded with as soon as other improvements already referred to are out of hand. Altogether, M. Gazagnaire, one of the most enterprising mayors Cannes ever possessed, and his colleagues upon the municipal council have the gratitude of the numerous colony of English for their efforts to make winter residence there healthy and agreeable. The property owned there by strangers, chiefly English, is worth over 3,000,000*l.*, and the improvements made in the sanitary conditions of the place will, of course, considerably enhance its value.

The new "Casino des Fleurs," built in the fashionable Montfleury quarter of Cannes, is just now the subject of much discussion. A fine building, with theatre, ballroom, reading-room, club and other salons for *les jeux* (if the concession is granted), it occupies more ground than the famous establish-

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ment at Monte Carlo; and an endeavour is being made to imitate the surroundings of the latter by the formation of gardens of rare trees and plants. But the questions arise, Does Cannes need such a place? and Will it not tend to lower the high social tone which has hitherto been a distinguishing feature of this aristocratic resort? To speak for the English villa residents and for the higher classes of the French, the balance of opinion seems to be against the establishment.

Beaulieu is making rapid advances into favour amongst the English. The choice of this charming spot by Lord Salisbury for a winter residence has naturally given it a great lift forward. The Premier obtained the finest site, with 60,000 mètres of land surrounding it; just below his lordship's property stands the villa of another Englishman, and a number of others, including Mr. Baird, who is really the founder of Beauleau as a winter resort, are scattered about amongst the olive and lemon groves and the beautiful gardens of southern plants and flowers. It is not likely that Lord Salisbury will return to Beaulieu this winter, since, before leaving the other day, he gave instructions to agents in Nice and Mentone to let his villa, if possible, for six months. As soon as this fact becomes generally known, there is no doubt that the somewhat high price fixed upon as rental by Lord Salisbury will be easily realised. The Americans, at any rate, can scarcely afford to let slip so splendid an opportunity for indulging one of their little weaknesses. The Maharajah Dhuleep Singh has rented the Villa Sicard, at Beaulieu, for his family. Sir Edward Malet has just bought land upon one of the small "caps" between La Turbie and Monaco, for the purpose of building a residence there. In giving instructions as to its character in drawing up the plans, Sir Edward remarked that he had no intention of retiring yet awhile from the diplomatic service, but the villa must be ready for his occupation in three years, in view, doubtless, of that event.

The fair face of Monaco, "the beauty spot of the Riviera," is changing continually. At the present rate at which building operations are being carried on, every yard of ground in the Principality will soon be occupied. Rumours have been running round the English Press that the gambling concession was approaching its end, but if any evidence was needed to prove that the "Société anonyme des Bains de Mer et du Cercle des Etrangers" had still a long lease of life, we find it in the extensive additions now being made to its hotel and in the redecoration of the gambling rooms in progress. It is not likely that a company, which during the past few years has conducted its affairs in the most parsimonious way, would spend money in this fashion if its privileges were to be withdrawn, as reported, in April next year. Let me say once more that the exact date of the expiration of the concession granted by the late Prince Charles of Monaco is 1913 and gambling must go on until that date, unless some unexpected event comes to stop it. Further remarks upon this subject I must defer until the half-yearly meeting of shareholders, which takes place at the end of the month.

Cap Martin, a picturesque headland stretching a couple of miles seawards between Monte Carlo and Mentone, is another happy discovery on the part of the enterprising British. Two years ago this point was bought up "in the rough" by Mr. Colville White, who built villas, which were readily purchased, and last year a company was formed and an hotel constructed on the head of the promontory. So great was its success that the building is now being doubled in size. The surroundings are of that *sauvage* tranquil character which many English people seek for and nowadays often fail to find near the more popular Riviera resorts. The views, north, south, east and west, are charming. The Empress Eugénie was so delighted with her stay at the Cap Martin last season that she has just bought 17,000 square mètres of land on the west side, which looks towards fair France, and Her Majesty has instructed Messrs. Giles & Gough, of London, to prepare plans for a villa which she intends to have constructed there.

Mentone for a long time held the reputation of being a sleepy town. During the past year or two, however, she has cast aside this slur upon her character, and she is now moving forward as fast as any of her competitors on the coast. The drainage scheme is completed, and this week it met with the approval of the French Sanitary Inspector-General, Dr. Proust. Ten days ago one hundred and twenty members of the French Society for the Advancement of Science visited Mentone, and they also expressed themselves satisfied with the sanitary condition of the place. A *maison disinfection* has been established for the fumigation of the contents of houses in which infectious diseases have occurred, and this has been made compulsory. The new breakwater is also completed, and whilst the summit of the wall constitutes a very fine promenade, the harbour is now a much safer anchoring-ground for yachts. This summer the prayer of English yachtsmen to have the harbour lighted by gas has also been answered. A new station—the Gare de Garavan—is to be opened on November 3. It will prove a great convenience to residents in the now fashionable eastern quarter of the town.

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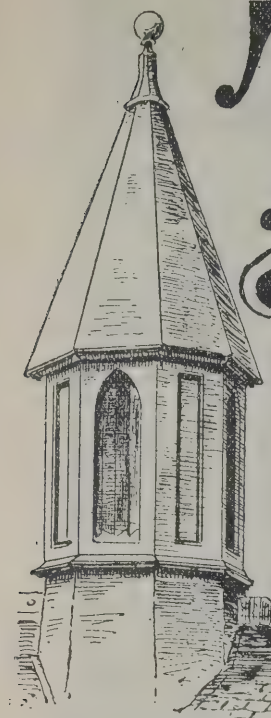
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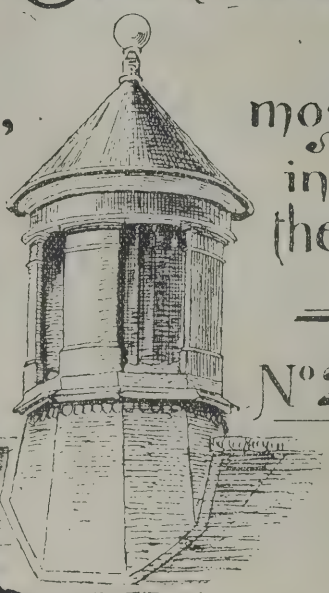
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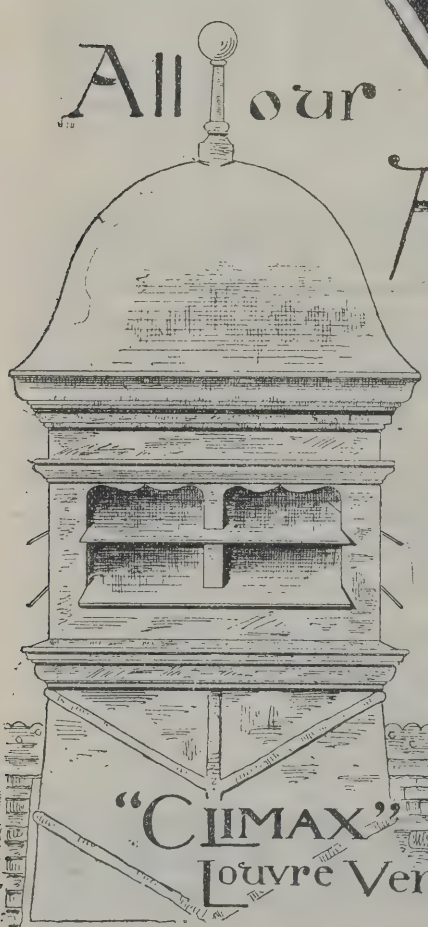
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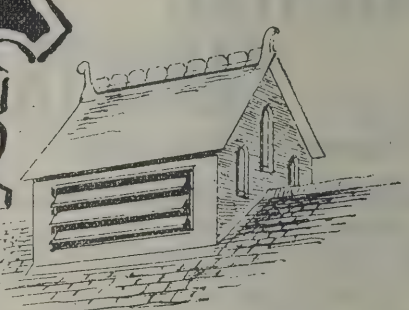
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Friday, October 30, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, NOVEMBER 6, 1891.

THE ARCHITECT
AND
CONTRACT REPORTER.

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COMPETITIONS OPEN.

BELFAST.—Dec. 1.—Competitive Plans are invited for a Hospital for Diseases of the Chest. Details can be had from Mr. F. Howard Sinclair, M.D., hon. sec. med. staff, 76 Pakenham Place, Belfast. Plans to be sent in in a sealed envelope, accompanied by a motto.

BURTON-ON-TRENT.—Nov. 21.—Designs are invited for Truant School. Mr. W N. Graham, School Board Offices, Burton-on-Trent.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

LICHFIELD.—Nov. 21.—Designs are invited for proposed Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

MERTHYR TYDFIL.—Nov. 12.—Plans are invited for School Buildings. Mr. E. Stephens, School Board Offices, Merthyr Tydfil.

CONTRACTS OPEN.

ANTRIM.—Nov. 10.—For Building Organ-chamber and Internal Alterations to Parish Church. Mr. S. F. Close, Architect, 53 Waring Street, Belfast.

BARRY DOCK.—Nov. 14.—For Constructing Lock. Mr. J. Wolff Barry, 21 Delahay Street, Westminster, S.W.

BATLEY.—Nov. 13.—For Building Two Blocks of Model Dwelling-houses, Purlwell. Mr. H. B. Buckley, Architect, Old Vicarage, Batley.

BATLEY.—For Building Public Baths. Mr. Walter Hanstock, Architect, Batley.

BEXLEY.—Nov. 24.—For Constructing Pipe Sewers. Messrs. A. Williams & Son, 18 Great George Street, Westminster.

BLACKPOOL.—For Building Markets for the Royal Hotel Company. Mr. H. B. Buckley, Architect, 8 East Parade, Leeds.

BRADFORD.—Nov. 9.—For Building Warehouse and Shed, Dudley Hil. Messrs. L. Leadly & Son, Architects, 11 Southey Place, Bradford.

BRADFORD.—Nov. 14.—For Building Thirteen Houses, Stabling, Coachhouse, &c. Mr. J. H. Holmes, Architect, Dudley Hill, Bradford.

BURNLEY.—Nov. 24.—For Construction of Filtration Areas, Conduits, Under-drains, Effluent Outfalls, &c. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

CARDIFF.—Nov. 11.—For Building Assembly Rooms, Shops and Premises. Mr. E. A. Lansdowne, Architect, 26 High Street, Newport, Mon.

CARDIFF.—Nov. 18.—For Building District Police Station, East Moors. Mr. W. Harpur, Town Hall, Cardiff.

CHARMINSTER.—Dec. 2.—For Erecting New Buildings at Dorset County Asylum. Mr. Thomas Coombs, 5 South Street, Dorchester.

CINDERFORD.—Nov. 7.—For Building Wesleyan Sunday School and Classrooms. Mr. John Wills, Architect, Derby.

CLEVEDON.—Nov. 30.—For Constructing Pier-head, with Band Stand and Pavilions. Mr. G. N. Abernethy, Engineer, 4 Delahay Street, Westminster, S.W.

CROYDON.—Nov. 10.—For Repairing Frith Road. Borough Road Surveyor, 8 Katharine Street, Croydon.

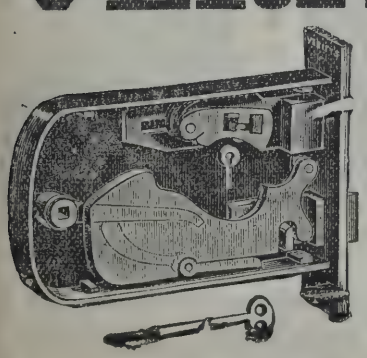
DAWLISH.—Nov. 7.—For Building Three Houses. Mr. E. Ellis, Surveyor, Exeter.

DUDDING HILL.—Nov. 13.—For Building Six Houses. Mr. W. J. Gutteridge, 42 Poultry, E.C.

GRAVESEND.—Nov. 12.—For Supply of York Paving and Broken Granite. Mr. Charles E. Hatten, Town Clerk, Gravesend.

HALIFAX.—Nov. 6.—For Building Shop Premises. Messrs. George Buckley & Son, Architects, Tower Chambers, Halifax.

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HATFIELD.—Nov. 17.—For Construction of Sewerage Works, Stoneware and Concrete Pipe Sewers (3,000 yards), &c. Mr. G. M. Lawford, Engineer, 13 Victoria Street, Westminster.

HERNE COMMON.—Nov. 11.—For Additions to Workhouse Infirmary. Mr. Harry Farley, Architect, Herne Bay.

HIPPERHOLME.—Nov. 10.—For Building Four Houses. Mr. R. Berry, Architect, Arcade Chambers, Halifax.

KENDAL.—Nov. 6.—For Converting Old Market Hall into Public Library. Mr. Stephen Shaw, Architect, Kendal.

LEEDS.—Nov. 11.—For Building Three Through Houses, Royal Park Estate. Quantities on application to Messrs. Swale & Mitchell, Architects and Surveyors, 98 Albion Street, Leeds.

LONDON.—Nov. 13.—For Constructing Underground Urinals and Water-closets. Mr. Henry Blake, Sewers Office, Guildhall, E.C.

LONDON.—Nov. 16.—For Construction of Large Brick Sewers for the Vestry of St. Pancras. The Clerk to the Vestry, Vestry Hall, Pancras Road, N.W.

MAIDENHEAD.—Nov. 11.—For Supply of Broken Granite. Town Clerk, Maidenhead.

NEWBRIDGE.—Nov. 16.—For Building Cottages. Mr. J. Francis, Leicester House, Newbridge, Mon.

NEWRY.—Nov. 21.—For Building Town Hall and Municipal Offices. Mr. Wm. Batt, M.R.I.A., Garfield Chambers, Royal Avenue, Belfast.

NORTH SHIELDS.—For Building Mineral Water Manufactory, Stabling for Thirty Horses, and Residence. Mr. H. Gibson, Architect, North Shields.

NOTTINGHAM.—Nov. 9.—For Alterations to Vagrant Wards, Workhouse. Mr. A. H. Woodall, Architect, Market Street, Nottingham.

OVENDEN.—Nov. 20.—For Weaving Shed, Warehouse and Offices. Mr. J. F. Walsh, Architect, Waterhouse Chambers, Halifax.

PEEL.—Nov. 6.—For Building Court House. Mr. H. Story, Government Offices, Douglas, Isle of Man.

PETERHEAD.—Nov. 24.—For Building Coastguard Station. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

POOLE.—Nov. 10.—For Building School, &c., Longfleet. Mr. H. F. J. Barnes, Architect, Towngate Street, Poole.

REDDISH.—Nov. 12.—For Construction of Pipe Sewers (3,200 Yards), &c. Mr. T. S. M'Callum, Engineer, 4 Chapel Walks, Manchester.

ROTTINGDEAN.—Nov. 7.—For Making-up Roads. Mr. William Gates, 86 High Street, Lewes.

STAFFORD.—Nov. 11.—For Building Odd Fellows' Hall. Mr. George Daim, Architect, St. Mary's Grove, Stafford.

SUNDERLAND.—Nov. 14.—For Enlarging Board Schools, Southwick. Mr. J. Shields, Architect, 42 Fawcett Street, Sunderland.

WEST LOOE.—Nov. 17.—For Building Coast Guard Station. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

WESTMINSTER.—Nov. 11.—For Constructing Swimming-Bath. Messrs. Spalding & Cross, Architects, 15 Queen Street, Cheapside, E.C.

WIDNES.—Nov. 6.—For Constructing Engine Bed and Foundation. Mr. Isaac Carr, Water Engineer, Widnes.

WINCHESTER.—Nov. 14.—For Building County Offices. Mr. James Robinson, Architect, County Hall, Winchester.

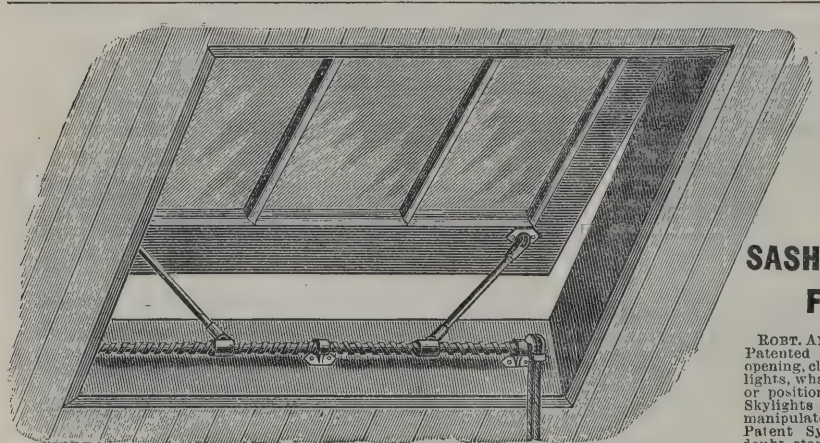
WITHAM.—Nov. 9.—For Building Schoolrooms, &c. Mr. Humphreys, Superintendent, South Metropolitan School Witham, Essex.

TENDERS.

CARLISLE.

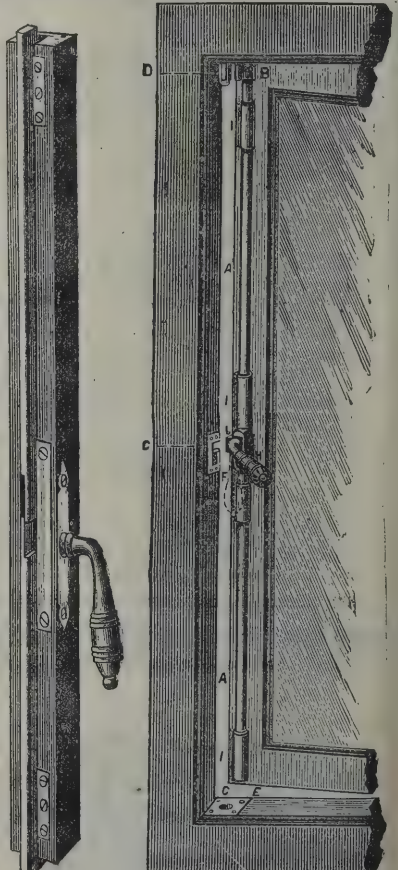
For the Tullie House Works, Carlisle. Mr. W. HOWARD SMITH, A.M.Inst.C.E., City Surveyor. Quantities by Mr. Linley Oldroyd, Leeds.

J. & R. Bell, Carlisle, mason	£5,481	0	0
H. Court, Carlisle, joiner	1,992	0	0
Pratchitt Bros., Carlisle, smith	444	0	0
W. Anderson, Carlisle, plumber	441	0	0
S. Ferguson, Carlisle, plasterer	340	0	0
S. Ferguson, Carlisle, concrete floors	240	0	0
D. Canning, Carlisle, glazier	222	0	0
C. J. Nanson, Carlisle, slater	190	0	0
W. N. Ballantine, Carlisle, painter	107	0	0
Total	£9,457	0	0



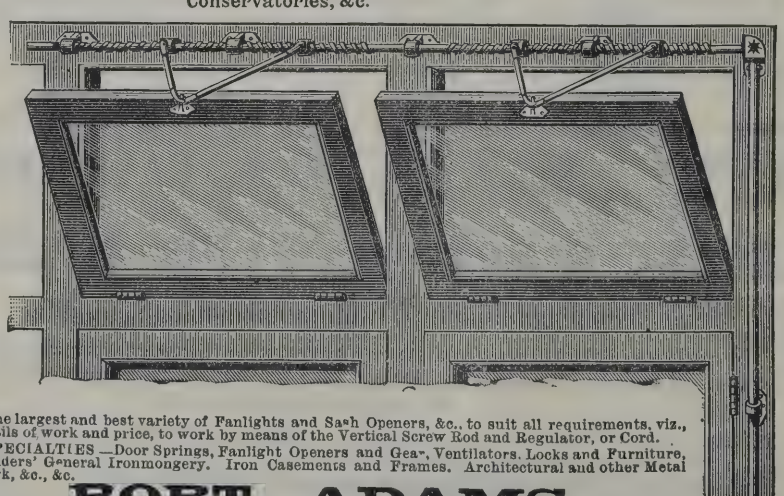
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W. Dawson, Aberdeen	£383 0 0
D. Macandrew & Co., Aberdeen	300 13 6
Hendry & Keith, Aberdeen	220 10 0
J. GARVIE & SONS, Aberdeen (*accepted*)	220 0 0

ANDOVER.

For Supply and Erection of a Nine Horse-power Otto Gas-Engine, for the Waterworks Committee. Mr. ALFRED PURKESS, Borough Surveyor.

Jewell & Son, Winchester	£244 0 0
Crossley Bros., Manchester	235 0 0
Watson & Haig, Andover	225 0 0
J. C. Richardson, Andover	215 0 0
ANDOVER GAS COMPANY (*accepted*)	205 0 0

CONWAY.

For Carrying out Water Supply Works, for the Conway Town Council and Colwyn Bay Local Board.

Monk & Newell, Liverpool	£33,447 0 0
Perks & Graham, Manchester	29,122 0 0
Bentley, Leicester	28,721 0 0
Wooly	26,986 0 0
Davies Bros., Wrexham	26,755 0 0
Griffith, Criccieth	24,769 0 0
J. Berth Jones, Llanrwst	24,500 0 0
Nuttall, Manchester	24,100 0 0
Wigan	22,462 0 0
Sheffield, Rhyl	21,975 0 0
BUGBIRD, Carnarvon (*accepted*)	21,050 0 0
Collingwood, Rhyl	20,552 0 0

DEPTFORD.

For Repairs to Two Houses, Grove Street, Deptford, for Messrs. A. C. Scott & Co., Limited. Messrs. TOLLEY & SON, Architects.

Josolyne, Young & Co.	£268 0 0
Jerrard	182 0 0
Marriage	180 10 0
Falkner	173 0 0
Jewell	162 0 0
CROAKER (*accepted*)	155 0 0

DEPTFORD—*continued.*

For Erection of Factory at Hanlon Street, Grove Street, Deptford, for Messrs. A. C. Scott & Co., Limited. Messrs. TOLLEY & SON, Architects. Quantities by Messrs. Parr & Son.

	By March 1.	By March 25.
Falkner	£6,489 0 0	£6,339 0 0
Hart Bros.	5,884 0 0	5,784 0 0
Croaker	5,768 0 0	5,668 0 0
Gould & Brand	5,077 0 0	4,977 0 0
Bulled & Co.	4,997 0 0	4,949 0 0
Jerrard	4,983 0 0	—
Marriage	4,980 0 0	*4,930 0 0

* Accepted.

DERBY.

For New Shop Front to Premises, Duffield Road, Derby, for Mr. J. Spencer Scholes. Messrs. COULTHURST & BOOTY, Architects, Derby.

Ford & Co.	£105 0 0
Walker & Slater	95 0 0
Weston	93 0 0
Peach	84 17 6

For Alterations and Additions to Castle Field Mills, Canal Street, Derby, for Messrs. James Tinlay & Co. Messrs. COULTHURST & BOOTY, Architects.

Boiler-house and Degumming-room.

Walker & Slater	£1,000 0 0
Eaton & Co.	990 0 0
Brown	966 0 0
Weston	899 0 0
Vernon	848 4 0

Mechanics' Shop.

Eaton	310 0 0
Walker & Slater	300 0 0
Brown	294 0 0
Weston	283 0 0
Vernon	282 0 0

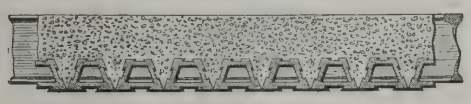
ILFORD.

For Rebuilding Premises, High Street, Ilford, Essex, for Mr. J. W. Poston. Mr. ALBERT E. PRIDMORE, M.S.A., F.S.I., Architect, 2 Broad Street Buildings, E.C. Quantities by Mr. Alfred Griggs.

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J. Moore & Sons, London	850 0 0
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A. Boots, Eastbourne	765 0 0
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W. Potts & Sons, Leeds	746 0 0
J. Miller & Sons, Clerkenwell	728 0 0
GILLETT & Co., Croydon (*accepted*)	700 0 0
Saintbury Bros., Walthamstow	666 0 0
J. Warner & Sons, Limited, London	651 15 0
J. B. Joyce & Sons, Salford	647 0 0
J. Smith & Sons, Derby	634 0 0
S. Van Aerschodt, Louvain, bells only	347 0 0

For Works in Connection with the Sewerage. Mr. C. TOME Borough Surveyor, Eastbourne.

Contract No. 4.

W. J. Bottrill & Co., Cannon Street	£10,531 0 0
J. Neave, Canning Town	9,341 1 7
F. Stevens, East Grinstead	8,559 11 2
J. Hayward, Eastbourne	8,099 0 0
G. BELL, Tottenham (*accepted*)	7,987 0 0

Contract No. 5.

J. Neave	8,895 13 6
W. J. Botterill	8,436 0 0
G. Bell	7,959 0 0
J. HAYWARD (*accepted*)	7,010 16 4
F. Stevens	6,772 15 8

LONDON.

For Construction of Public Conveniences, Hampstead Heath, for the London County Council.

J. Bentley	£721 7 5
W. Inwood	611 0 0
B. Finch & Co.	603 0 0
Benjamin & Robinson	602 0 0
Jackson Bros.	591 0 0
H. Fowler	559 0 0

LONDON—*continued.*

For Sundry Additions, Alterations and Repairs (including Works required by London County Council and External Painting) at the Vestry Hall, Bow Road, for the Churchwardens and Overseers. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street. Quantities by Mr. C. W. Heward.

Pearce & Co., Highbury	£890 0 0
Neil & Co., Stepney	871 10 0
Jackson & Jennings, Poplar	820 0 0
J. & H. Cocks, Mile End	797 0 0
Limm & Son, Millwall	795 0 0
W. Johnson & Co., Wandsworth	795 0 0
J. C. Edmunds, Poplar	788 0 0
G. White & Son, Bow	779 0 0
J. HOLLAND, Poplar (*accepted*)	748 0 0
A. Martin, Battersea	695 10 6
Architect's estimate	750 0 0

For Works in Connection with Nurses' Dormitories, &c., at Infirmary, Bow, for the Guardians of the City of London Union.

Mallett, Worship Street	£1,569 0 0
Deputy Harvey, Redcross Street	1,432 0 0
Wood, Mile End	1,370 0 0
Cocks, Mile End Road	1,299 0 0
Jackson Bros.	1,248 0 0
Phillips, Cheapside	1,199 0 0
PEARCE & Co. (E. W. T. GREEN), Kingsland (*accepted*)	1,136 0 0

For Building Lodge at Schools, for the Guardians of the Strand Union.

Austin & Sons	£1,583 0 0
Pavy	1,415 0 0
Groves	1,368 0 0
Stayings	1,296 0 0
Houghton	1,258 0 0
Emmett	1,228 0 0
Godfrey & Son	1,194 0 0
Coldwells & Sons	1,146 0 0
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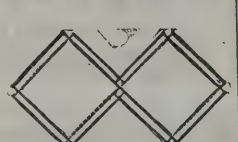
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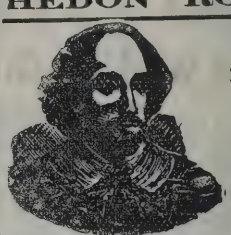
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S. Chafen	£6,488 0 0
W. R. Parker & Co.	4,357 10 6
E. Proctor	3,400 0 0
J. Biggs	3,350 0 0
G. Double	2,802 0 0
T. Docwra & Son	2,376 0 0
J. Mowlem & Co.	2,335 0 0
G. Munday & Sons	1,941 0 0
Boundary Fencing.	
J. B. Hollom	4,984 0 0
T. W. Burbidge	3,026 0 0
F. Morton & Co.	1,900 15 0
C. T. Mallett & Co.	1,858 3 9
W. Barnes	1,475 10 0
Hill & Smith	1,311 2 2
W. Parham	1,138 0 0
G. Munday & Sons	1,122 0 0
Iron Wire, Wire Rope and Fencing Co.	1,005 0 0
J. Elwell (*exclusive of brick and stoneware*)	998 0 0
L. Faulkner & Sons	853 0 0

For Repairs to No. 41 King Henry's Road, South Hampstead, for Mr. Jackson W. Smart. Messrs. TOLLEY & SONS, Architects.

Rubardt & Son	£262 0 0
Sabey	260 0 0
Carter	258 0 0
Bence	250 0 0
Marriage	245 0 0

For Supply of Road and Path Repairing Material, for the London County Council.

Victoria Park.	
J. Mowlem & Co.	£805 0 0
G. G. Rutty	730 0 0
W. Griffiths	677 0 0
J. Shelborne & Co. (incomplete)	348 15 0
Battersea Park.	
W. Hudson	685 0 0
Hall & Co.	390 0 0
H. Covington	387 10 0
J. S. Gabriel	312 1 8

LONDON—*continued.*

For Alterations to Notting Hill Fire Station, for the London County Council.

J. Knight	£327 0 0
S. Dowling & Sons	275 0 0
G. N. Watts	271 0 0
G. Inglish	162 0 0

MAIDENHEAD.

For Supplying a 10-ton Roller, for the Urban Sanitary Authority, Maidenhead.

T. Green & Son, Blackfriars	£350 0 0
Aveling & Porter, Rochester (cash)	330 0 0
Wallis & Steevens, Basingstoke (cash)	315 0 0

PETERBOROUGH.

For Building Dwelling-house, Nene Road, Peterborough, for Mr. G. Julyan. Mr. JAMES RUDDLE, Architect, Boroughbury, Peterborough.

Sharp & Shepperson, Peterborough	£755 0 0
Spencer, Peterborough	698 0 0
Bailey, Peterborough	685 0 0
Howard, Holme	650 0 0
Wright, Peterborough	630 0 0
Gray, Peterborough	616 0 0
Guttridge, Peterborough	615 0 0
Wenlock, Peterborough	605 0 0
Hicks, Peterborough	593 10 0
MACHIN, Peterborough (*accepted*)	588 10 0

WOOLWICH.

For Supply of 2,000 Galvanised Iron Dustbins, for the Woolwich Local Board.

Weekes & Co., Dartford	£449 0 0
Avondale Iron Company, Bristol	425 0 0
Pearson, Woolwich	400 0 0
Hill & Smith, Tipton	395 12 6
Braby & Co., Deptford	391 13 4
Mallett & Co., Laurence Pountney Hill	390 0 0
Harvey & Co., Lewisham	383 6 8
P. Round, Stourbridge	383 6 8
Smallbone & Co., Walworth	383 6 8
Jukes, Coulson, Stokes & Co.	383 5 0
Bird & Co., London	366 13 4
J. Gibbs, Fenchurch Street	365 0 0
LLOYD & SON, Woolwich (*accepted*)	350 0 0
Wood Bros., Brockley	349 10 0

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For Building Chancel and Vestries to St. Michael's Church, Runcorn. Mr. T. D. BARRY, Architect, Liverpool. Quantities supplied.

Miller, Liverpool	£1,350 0 0
Brown & Backhouse, Liverpool	1,260 0 0
Clark, Liverpool	1,160 0 0
HUGHES & STIRLING, Liverpool (*accepted*)	1,124 10 0
McDermott, Liverpool	1,094 0 0
Laurie & Brimley	1,089 0 0

THE FAULD GYPSUM MINES.

THE members of the North Staffordshire Naturalists' Field Club during the last excursion of the season visited the Fauld gypsum mines. The workings are all on the level and are of great extent, piercing the hill in all directions wherever the beds of gypsum are found to lie. After a walk of about a quarter of a mile underground, the party halted in front of the finest deposit of the mineral where the huge blocks are quarried for church use, &c. The mineral *in situ* is charged with a large percentage of water, giving it a grey appearance, with marl-coloured veins and streaks running in every direction. On holding a light behind a lump of the mineral its beautiful transparency became evident. Mr. Burke read a paper on the gypsum deposit. He said the gypsum beds at Fauld occur in veins and lenticular masses or pockets, varying from an inch to over 35 feet in thickness. The bulk of the rock is stained red and yellow by the infiltration of iron oxide, but beautiful masses of pure white alabaster are met with. This deposit of gypsum is intercalated between beds of the best-known red marls of the Keuper, the upper division of the Trias formation, which extends over so large a portion of the Midlands. Chemically, it consists of calcium sulphate, with the addition of two parts of water of crystallisation. It is the product of a great salt lake or inland sea, such as the Caspian Sea of the present day, fed by rivers; the incoming water only partially met the loss by evaporation. Under these conditions, when 37 per cent. of water has been evaporated, gypsum begins to be deposited. A further concentration and evaporation of the water leads to the deposition of chloride of sodium (rock salt), but as this latter mineral is not found here, it must be assumed that either the water was diluted before the point of saturation for rock salt was reached, or the salt, if deposited, has been subsequently dissolved, or removed by denudation. The lessees, Messrs. Newton & Staton, had kindly illuminated the passages of the mine, and the various interesting spots were shown by means of magnesium lights. The next point of interest was the getting of the mineral for making cement, plaster of Paris, &c., and the party were conducted to the face of the working where the workmen were at actual work, and the mode of drilling and blasting, &c., was fully explained. The party then returned through other portions of the workings, halting here and there to admire the curious and beautiful growth of fungi on the timbering of the mines, and then emerged on the opposite side of the hill to that in which they had entered. The plaster and cement works of Messrs. Staton, at Tutbury, where the Fauld gypsum is converted into plaster of Paris and cement, were also visited, and the process of manufacture was explained by Mr. H. Newton.

TRADE SYNDICATES IN FRANCE.

THE Ministry of Commerce has just published some statistics giving the number of trade syndicates in France, and showing the increase which has taken place since the year 1884, when a measure was passed recognising their right to exist, whereas they had up till that time only been tolerated. The number of syndicates now in existence is 3,253, of which 2,503 are industrial and commercial associations, while 750 are agricultural; while of the industrial and commercial associations, 1,127 are for employers, 1,250 for workmen, and 126 mixed syndicates—that is to say, embodying both employers and employed. There are also 127 irregular syndicates—that is to say, associations which have not yet complied with the formalities required by the law of 1884, so that the total is 3,380, these being spread over 962 communes or parishes, although the great majority of them are, of course, in the large towns. They have, in all, 596,380 members, of whom 106,157 are employers, 205,152 working men in towns, and 269,298 peasants and agricultural labourers, thus showing the large increase of 114,947 members within the last twelvemonth. The figures giving the number of members show, however, that only 5 per cent. of the employers, 6 per cent. of the working men in the towns, and 8 per cent. of the peasants and agricultural labourers belong to syndicates, the trades which show the largest proportions being those of the builder, the miner, the baker, the wholesale liquor-seller, the cotton-spinner, the boot and shoe maker, the hatter, the butcher and the upholsterer.

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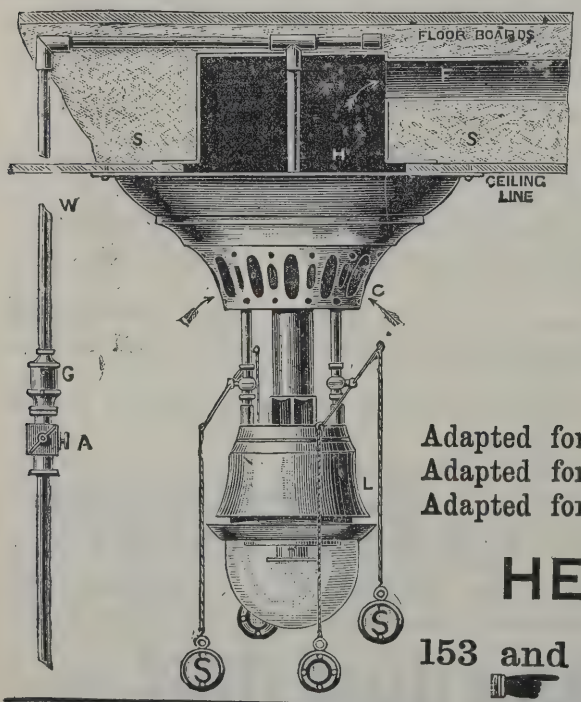
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BUILDING AND BUILDERS.

IT is proposed to build a new church for St. Faith's District, Lincoln, at a cost of something over 3,000*l.* Rev. E. Wharton and Mrs. Wharton give 1,000*l.*, and Mr. John Foster 500*l.* towards the cost.

A CHEQUE for 2,000*l.* has been sent to Mr. W. Quarrier for the purpose of building another orphan home at Bridge of Weir.

THE London correspondent of the *Manchester Courier* says :—I hear for the first time, upon unquestionable authority, that the late Mr. John Cochrane, who committed suicide at his offices in Westminster a few weeks ago, was driven to the act immediately after receipt of a lawyer's letter from the Liverpool Corporation concerning the contract which he had undertaken for constructing the Vyrnwy tunnel under the Mersey. The Corporation had imposed in this matter conditions of work against which Mr. Cochrane had protested on the ground that they were impracticable and all but impossible, and, as was admitted at the meeting of the Liverpool Town Council the other day, he had lost about 17,000*l.* over the contract. Just before Mr. Cochrane received the lawyer's letter abovementioned the Corporation consulted Sir Benjamin Baker with regard to the tunnelling, and in consequence of opinions expressed by that eminent engineer decided to modify the conditions which they had imposed upon Mr. Cochrane. Unfortunately the decision was not promptly communicated to Mr. Cochrane, otherwise I am assured he would have been still alive. Sir Benjamin Baker was greatly distressed to hear of Mr. Cochrane's death, and the more so because he could, had he seen him a little while before, have given him news which must have prevented it.

OPERATIONS have been begun for the provision of a new Board school at Tong Park, for the Baildon School Board. The building will cost 2,750*l.*, and will accommodate 130 mixed and 70 infant scholars.

THE annual statement of the Dean of Guild Court, Greenock, shows that there had been thirty-one courts held during the year, and that 712 cases had been considered, as compared with 745 in 1890 and 733 in 1889. The applications for building warrants comprised three tenements of shops and dwelling-houses, one villa, three public buildings (churches, &c.), twenty-five buildings for business purposes, sixty-five miscellaneous buildings and sanitary improvements and sixty additions and alterations to property. The total estimated cost of the buildings and alterations authorised was 35,449*l.*, as against 36,060*l.* in 1890 and 35,070*l.* in 1889. Building warrants were granted in connection with three new industries—the Preserve Works, the Cabinetmaking Works and the Cereal Company.

THE following resolution has been submitted to the Southampton Town Council :—"That the Hants Literary and Philosophical Society hears with concern that it is proposed to build a mortuary against the town wall, and trusts that the Corporation will not allow the wall to be obscured in this way."

AT the Edinburgh Dean of Guild Court warrant was granted to Messrs. Usher & Co. to take down old buildings to the north of the Edinburgh Distillery at the Siennes, and to erect buildings five storeys in height, to be used as bonded warehouses and maltbarns, with relative stores.

PLANS have been passed in the Glasgow Dean of Guild Court for the erection of a hall and reading-room for the use of the workmen at Earnock Colliery. Plans for 112 workmen's houses at the colliery were passed at the same time, the estimated money value of the whole being about 9,000*l.*

THE *Bolton Chronicle* says in regard of the fund for the erection of public baths in Farnworth, that the fund, including the 1,000*l.* so generously offered by Mrs. Almond, now amounts to close upon 2,500*l.*, and a meeting of the committee will shortly be held, at which steps will be taken for the commencement of the work of erection. Another 500*l.* is required before the amount really wanted is realised.

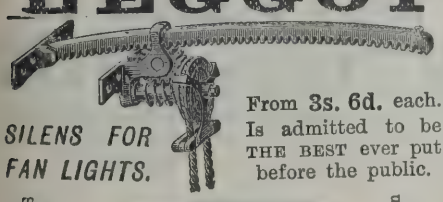
THE Town Hall, erected at Cleckheaton at a cost of 12,000*l.*, is to be formally opened on February 10. The building has been erected from the plans of Messrs. Mawson & Hudson, of Bradford.

THE executive committee of the society for building workmen's houses at Biesdorf, near Berlin, have been informed that the Emperor of Germany has expressed himself highly satisfied with the fittings of the model house which he recently visited.

MR. THOMAS SEXTON, whose tender had been accepted for additions to the Town Hall of Dalkey, co. Dublin, has declined to carry out the contract, as the season is so far advanced. When he made out his tender it was, he informed the Board, on the understanding that the work was to be done at the time when the days were long and fine. The Board have made an order that new tenders be advertised for.

AT Hove the employés of Mr. S. C. Smale, builder, at a dinner at the Neptune Inn, presented their employer with a

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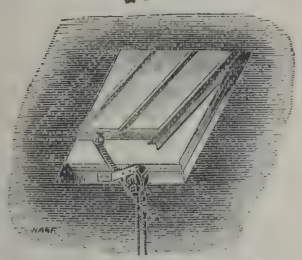


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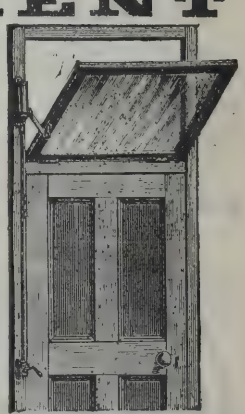


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1A CRESCENT, MINORIES, LONDON, E.C.

testimonial. About forty sat down to dinner, after which Mr. H. Mew made the presentation, which consisted of two massive bronze statuettes. Mr. Smale, in thanking them, said that it gave him great pleasure to know that he was held in such esteem by his men.

THE foundation-stone of a new London theatre in Cranborne Street, Piccadilly, has been laid. The building will be erected from the designs and under the superintendence of Mr. Spencer Chadwick, Mr. C. J. Phipps having acted as consulting architect.

THE Woolton Local Board have accepted the offer of Mr H. Gaskell, J.P., to build public baths for the village, if the Board find a site and maintain the baths when built.

OFFICES erected for the Swindon Local Board have been opened by the Marquis of Bath. The contract, which was for 8,000*l.*, was undertaken by Mr. J. Reed, of Plymouth, the architect being Mr. Brightwen Binyon, of Ipswich.

AT the annual meeting of the Birmingham Kyrle Society, held at the Edgbaston Assembly Rooms, it was decided to erect a new hall in place of the present building in Lawrence Street, at a cost of between 3,000*l.* and 4,000*l.*

TRADE NOTES.

ST. MARY'S Catholic Church, Burnley, is at present undergoing renovation, special attention being paid to the ventilation of the church, which has been entrusted entirely to Messrs. Baird, Thompson & Co., ventilating engineers of London and Glasgow, who are introducing their well-known Æolus invisible or concealed self-acting roof ventilators for the extraction of the vitiated air, and their Æolus improved waterspray air-inlet ventilators for the admission of a pure supply of fresh air. This system has been applied to numerous churches and public buildings with the greatest success. The whole of the ventilators are entirely concealed, and a complete and efficient system of ventilation is being carried out without draughts.

THE new Infectious Diseases Hospital, Burton-on-Trent, is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves, with descending smoke flues, supplied by Mr. E. H. Shorland, of Manchester.

THE ventilation of Walkerburn Church, Galashiels, has been entrusted to Messrs. Baird, Thompson & Co., ventilating engineers, London and Glasgow, who have introduced their patent "Æolus" improved invisible roof ventilators for the extraction of the vitiated air.

FOR warming the house of Dr. Henry Sydney, Staines Road, Hounslow, Mr. John Grundy's patent warm air ventilating grates are now being fixed.

THE Rural Sanitary Authority of the Hemsworth Union are taking steps to procure a provisional order for acquiring lands and easements in connection with an extensive system of water supply. Nearly a year ago the authority instructed Mr. M. Paterson, M.Inst.C.E., Bradford, to report upon a scheme of supply in and for the township of Hemsworth only. A source absolutely trustworthy could not be found within the prescribed limits, and Mr. Paterson then recommended the consideration of the question of a complete scheme for the whole union. Instructions were given and reports obtained on schemes of supply from the Pontefract Corporation and the Penistone Local Board works respectively, the water in both cases being pumped from subterranean sources, and both somewhat hard, being from 11 to 12 degrees of hardness. After due deliberation the authority have decided to adopt a scheme suggested by Mr. Paterson, the source selected by him being the works of the joint Water Boards of Dewsbury and Heckmondwike. The water is of exceptionally fine, pure and soft character from the elevated moorlands lying on the Derbyshire boundary of the West Riding, above Penistone, and quite free from liability to lead-poisoning. It is proposed to tap the Board's conduit a few miles from the source, and the supply will be by gravitation, the works consisting of a line of pipes about 15 miles long, a service reservoir at Ringstone Hill 402 feet above sea-level, and about 32 miles of distributing mains. The estimated cost is 28,000*l.*

A NEW church clock has been placed in the parish church, Uttoxeter. The clock is erected as a memorial to the late Mr. Charles Bunting, who for many years was churchwarden and one of the leading spirits of the town in public matters. The order was placed with Messrs. John Smith & Sons, Midland Clockworks, Derby, who have carried out the work to the satisfaction of the committee. The clock has two dials, each 7 feet across, which are illuminated at night. It chimes the Westminster quarters, and strikes the hours upon the large tenor bell. All the wheels are of the best gun-metal, with machine-cut teeth. Special apparatus is provided to maintain the action during the time of winding, and there is a small dial inside by which the large external hands are adjusted.

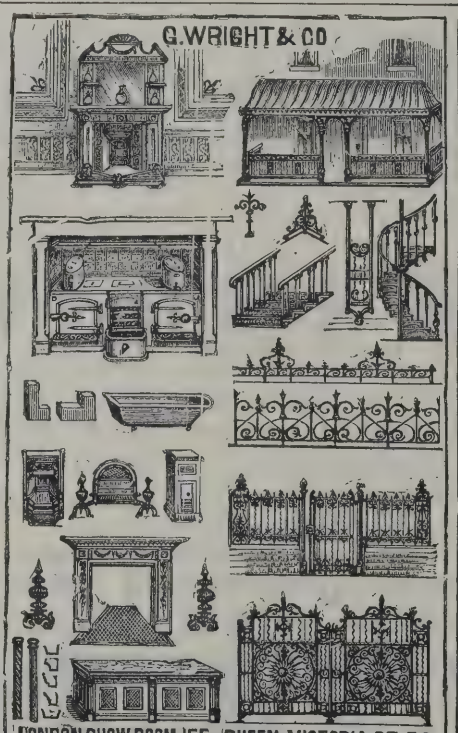
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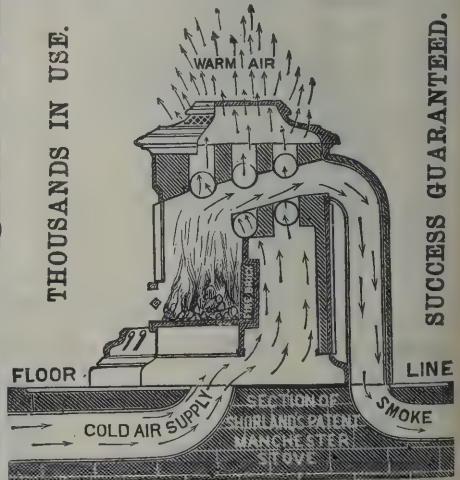
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Shorland's Inlet and Outlet Ventilators in every Design.

Automatic gas apparatus is provided, by which the gaslights will be turned up and down for the varying lengths of the days throughout the year. Messrs. Smith guarantee the clock to maintain perfectly accurate time with less variation than ten seconds a month. The same firm are also now making similar large clocks for Callaby Castle, Northumberland, Little Wenlock Church, Salop, Birmingham Free Library, and others.

AMONG the numerous presents the Prince of Wales will receive on Monday next are three stained-glass windows, one given by the Queen, one by Lords Gosford, Colville, Suffield, Sir D. M. Probyn, Sir C. C. Teesdale, Sir F. Knollys, Captain Stephenson, General A. E. A. Ellis, Canon Dalton, Colonel Stanley Clarke, Captain G. Holford, Rev. F. A. J. Hervey, and Mr. M. Holtzmann, and one by Mr. F. W. Gibbs, Q.C. These windows have been designed and executed by Messrs. Heaton, Butler & Bayne, under the supervision of Sir A. Blomfield & Sons, for Sandringham Church.

THE Sneyd Colliery and Brickworks Co., Limited, of 23 Bartlett's Buildings, Holborn Circus, E.C., inform us that they have removed their depôt for glazed bricks, &c., from Maiden Lane Station to the New St. Pancras Goods Station, Midland Railway Company, entrance Ossulston Street, Euston Road, N.W., and that they are now prepared to execute orders from their stock there at the shortest notice. The depôt will be in the hands of experienced management, and all the various shapes and patterns of white and coloured glazed-bricks will be kept in stock, also large and varied stocks of fire-bricks, fire-tiles, &c. This firm have lately supplied the whole of the glazed-bricks for the new stores of Messrs. Spiers & Pond at Blackfriars Station.

A PRACTICAL demonstration of the working of "The Kennedy Dry-Press Brickmaking Machine" was recently given at the works of the Hewitt Brick and Tile Company, Limited, Southall, near London. It is simple in construction and substantially built of the best of material; every shaft and pin in it is of the best steel and the framework exclusively iron; the entire strain of pressure comes upon two heavy wrought-iron bars entirely independent of the framework; the pressure is made by four compound lever-power of the first order, the only press-brick machine having levers of the first order. The machine makes four bricks at each pressure, discharging the same on a receiving-table at the rate of forty-four bricks per minute, the daily capacity amounting to 26,400. The mould-table is stationary, and the moulds are made of the best hardened steel, highly polished, in order to give bricks that superior finish so essential to first-class fronts. The machine is strictly automatic, self-feeding and discharging. It is claimed for the bricks that they are superior to those made the old way. They go direct to the kiln from the press, thereby avoiding additional and expensive handling. The bricks can be set as high in the kiln as is desired for burning, forty being the customary height. The bricks are warranted to stand more crushing weight than those made by the old process, and are much more easily and rapidly laid in the wall from the fact of being of uniform size and thickness; the mason does not lose time in reversing the bricks, hunting for the thick and thin side of same, as is usual with mud-made bricks. The machine can be operated all the year round, independent of the weather, as all work is done under shelter. It will work successfully in any dry or semi-dry clay having brick-making qualities; it will work fire-clay and the refuse of slate quarries. It can be regulated so as to increase or lessen the pressure, or increase or lessen the quantity of clay without stopping the machine. The moulds of the machine are heated, thus obviating the necessity of stopping to clean the same, leaving the moulds as clean after a day's work as they were at the beginning. The machines are extensively used in the United States.

VARIETIES.

CONSIDERABLE progress has been made with the excavations now being carried out for Lord Bute, under the superintendence of Messrs. Kempson & Fowler, of Llandaff, on the site of the old Blackfriars Monastery, which is within the Castle grounds. Many parts of the old foundations have been traced, a piece of the original consecrated altar slab has been found, also many interesting fragments of tombs, pieces of worked stone, glass, tiles, &c., all of which have been carefully preserved.

A LARGE and handsome memorial brass, to commemorate the tercentenary of Sir Richard Grenvile's death from wounds on board the Spanish galleon *Sant Paule*, has been erected in Bideford Church by his lineal descendant, Rev. Robert Granville, the rector. The brass is about 4 feet in length by 3 in width, with a suitable border, and in the centre of the top are the arms of the Grenvile and St. Leger families, with the motto "Deo Patriæ Amicis." The inscription is in a clear Old English text, and is as follows:—"About the 4th of September, A.D. 1591, died of his wounds on board the Spanish galleon the

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BEST GREEN

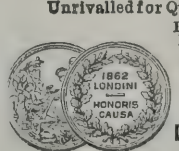
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MANSFIELD STONE,

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Sant Paule off the island of Flores in the Azores having in H.M.S. the *Revenge* endured in a fifteene houres fight the assault of fifteene severall Armadoes all by tournes aboorde him and by estimation eight hundred shot of great artillerie, besides manie assaults and entries, Sir Richard Grenvile, Knight, Vice-Admiral of England, aged 48." The translation of his last words, spoken in Spanish, were these:—"Here die I, Richard Grenvile, with a joyful and quiet mind for that I have ended my life as a true soldier ought to do, fighting for his Country, Queen, Religion and Honour; my soul willingly departs from this body leaving behind the lasting fame of having behaved as every valiant soldier is in duty bound to do. A fight memorable even beyond Credit and to the Height of some Heroicall Fable." The brass has been designed and executed by Messrs. Pratt & Sons, Tavistock Street, Covent Garden. It forms a fine memorial, and the whole of the work is carefully carried out.

A SUM of 50,000*l.* has been raised by private subscription for the proposed new art galleries, Glasgow.

TOWARDS the building of a new cathedral church at Swansea Sir John Llewellyn has offered 1,000*l.* in three years, on condition that the work is taken up vigorously and that a substantial and worthy building is erected.

THE Joint Rivers Committee, charged with the task of preventing the pollution of the Mersey and Irwell, have appointed Mr. R. A. Tatton, civil engineer, of Manchester, to the office of general inspector, at a salary of 600*l.* per annum. Four sub-inspectors have also been appointed.

THE County Council of Kirkcaldy have decided to write to the North British Railway Company asking them to put all their bridges on the highways in the district and crossing their line in such a sufficient condition to allow traction-engines to cross them. The company were bound to keep the bridges in such a state as to safely conduct ordinary traffic. The notices on these bridges pointing out that traction-engines could not pass over them was considered illegal.

MR. PLUNKET, First Commissioner of Works, has written to Mr. F. Dethridge, clerk to the Paddington Vestry, stating that it is proposed to form a new entrance for equestrians into Hyde Park, opposite Albion Street, and asking whether the Vestry will, at the ratepayers' expense, effect the necessary alterations to the roadway and footway outside the park.

THE *Leeds Mercury* understands that Messrs. Webster have decided to accept the sum of 33,000*l.* which the Leeds County Council at its last meeting resolved to offer for the Quebec Buildings, opposite the Queen's Hotel.

THE death is announced, suddenly, of Mr. W. B. Scott, C.E., at his residence, Church Row, Hampstead, in his 70th year. Mr. Scott occupied the position of chief surveyor to the Vestry of St. Pancras for thirty-three years. The many public improvements that have taken place in the parish during the past twenty years have all been under Mr. Scott's supervision, and he was attending to his public duties within a few hours of his death.

IT has been notified to the subscribers of the Kilmarnock Infirmary that two ladies have offered to give 1,000*l.* each for the endowment of two cots in the infirmary.

ON November 16, Mr. Gilbert Dalziel will publish "Judy's Annual" for 1892, which this year is entitled "Girls up to Data." The book will contain thirty-five letters written by thirty-five girls to Maud, the lady who is responsible for the work. The portrait of each fair damsel is given, sketched either by Wm. Parkinson or by J. Bernard Partridge.

THE directors of the London, Brighton and South Coa Railway purpose greatly enlarging their terminus at Victoria Station.

THE *Scotsman* says that in consequence of the representations that have recently been made to the Government with regard to the condition of the Palace of Linlithgow, the Secretary for Scotland, accompanied by Mr. Cochran Patrick and Mr. Robertson, of the Office of Works, have visited the burgh and made a careful inspection of the building.

IN connection with a proposal to enclose and beautify the Castle grounds at Knaresborough, for the town, the Improvement Commissioners have confirmed a resolution passed by the committee, that it was desirable to advertise for competitive plans to carry out the proposed improvements, and sanctioned the payment for the best and second designs.

THE executors of the late Dr. Beaney, who by his will bequeathed ten thousand pounds to the city of Canterbury for a free library, have been advised that the legacy is void under the Statute of Mortmain. The Mayor of Canterbury has instructed a Melbourne lawyer to represent the interests of the citizens in the action pending in the Melbourne Law Courts.

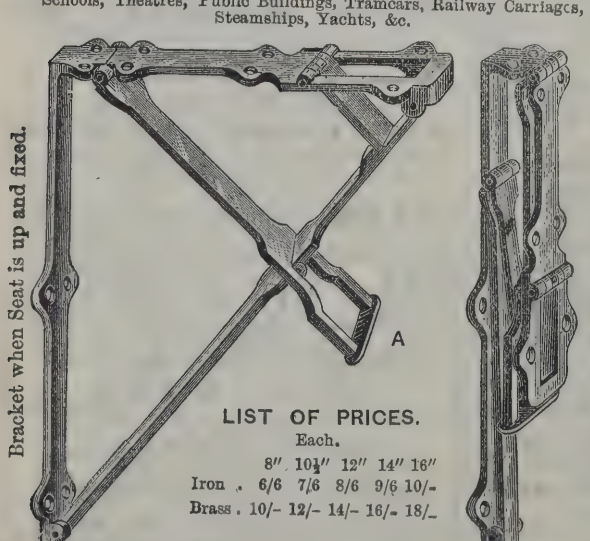
THE Durham County Council have adopted a scheme for allocating the Government grant for technical education in the county. The total amount of the grant is estimated at 25,000*l.*

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The ONLY GOLD MEDAL, in addition to FIRST-CLASS HONOURS;
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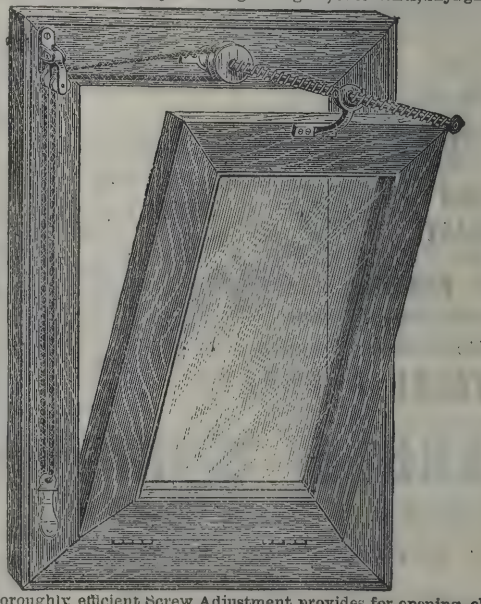


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The Rhyl Improvement Commissioners propose to purchase the waterworks undertaking, and to improve the water supply.

Excursions for the working-classes and others to the Chicago Exhibition of 1893 are being arranged for by the Committee of the Polytechnic Institution, Regent Street. A week will be allowed in Chicago, and places and cities of interest will be visited on the way and in returning.

At the monthly meeting of the Sale Local Board the Public Works Committee recommended that the solicitor to the Board should take proceedings to enable them to acquire fifteen acres of the Priory estate for the purposes of sewage disposal. The cost of the scheme, as first proposed, was 12,722*l.* By a later scheme the estimated cost is 16,083*l.*

A railway bridge across the Nile at Embabeh, which has just been constructed by some French contractors, has been declared defective. One of its nine piers is to be rebuilt, and portions of the ironwork are to be replaced at the contractors' expense.

Three new branch schools of art are to be opened in Birmingham on Monday—one at the Board School in High Street, Harborne; one at Highfield Road, Saltley; and one at Tindal Street, Balsall Heath. This brings up the number of branch schools of art to fourteen.

The Birmingham Board of Guardians have adopted a resolution, "That no contracts be in future placed by the Board with any person or firm not paying the regular or standard rate of wages."

NEW CATALOGUES.

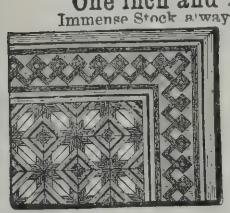
We have received from Messrs. Townshend & Co., of Birmingham and 62 Holborn Viaduct, London, their illustrated catalogues of latest productions in art metalwork. The catalogues are beautifully printed, and it is clearly to be seen that an immense amount of care has been exercised by all concerned in the production of the illustrations, every detail of ornament, even to the most minute, being rendered so truthfully. The useful and ornamental furniture and appliances connected with fireplaces and connected with lamps cannot be too highly commended. These are only a portion of the large variety of articles connected with those furniture appliances in which the public look for artistic treatment. To mention only one article of fireplace furniture: in the fenders alone a wonderful variety of artistic excellence is visible. The articles necessary and useful, and also those convenient and luxuriant—which, where economy has to be studied, can be dispensed with—cover so large a field that we recommend all interested in adorning their homes with tasteful furniture to consult the catalogue for themselves.

A LAND SALE ON THE SURREY HILLS.

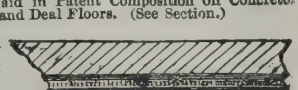
Favoured by propititious weather, which came as an enjoyable relief after the previous long spell of wet, and amidst some of the loveliest scenery in the kingdom, there took place on Wednesday of last week at Chelsham, in Surrey, a sale by auction of a number of freehold plots of land, two acres each and upwards, the property of the Lands Allotment Company, Limited, and forming portion of an estate containing altogether about 1,100 acres, situated on the Surrey hills, adjoining Worms Heath, at an altitude of something like 800 feet above the level of the sea, where the salubrity of the atmosphere is strikingly manifest. The journey to Marden Park Station, which is only seventeen miles from London, occupied about forty minutes, and carriages were in waiting to convey the company of intending purchasers and others from thence to the estate, which proved to be a short and romantic drive. The country round about being well-wooded, the autumnal tints lent an additional charm to an almost unsurpassable landscape. After being driven as far as Chelsham Court and over the whole estate, from which magnificent views across the counties of both Surrey and Kent are obtainable, the company were invited into a farmhouse building, where a substantial luncheon was partaken of, and to which it goes without saying ample justice was done by those present, to whose appetites the "caller" air had naturally imparted a keen edge. After removal of the cloth, Mr. George Newman, the surveyor and auctioneer to the Lands Allotment Company, who (in conjunction with Messrs. C. & F. Rutley) conducted the sale, explained the various stipulations and conditions laid down, which were deemed to be fair and reasonable, and then the bidding commenced. Only a few lots, however, changed hands at prices averaging about 100*l.* per acre, and the remainder were eventually withdrawn, but it is understood that there are numerous inquiries after the unsold lots, which are being dealt for by private treaty, and a marked disposition was manifested to acquire lands of such an exceptional character, divided into plots suitable either for the erection of houses or small villa-

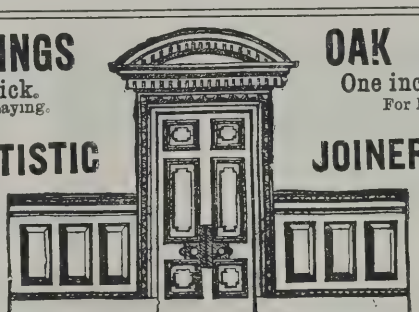
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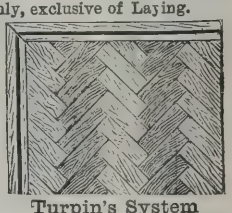
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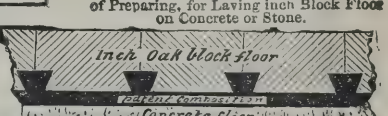


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farms, within so convenient a distance of the metropolis and with so many advantages appertaining, not the least of which is the fact of the Chelsham and Woldingham Waterworks, from whence a supply of remarkably pure water is obtainable, being in close proximity to the estate.

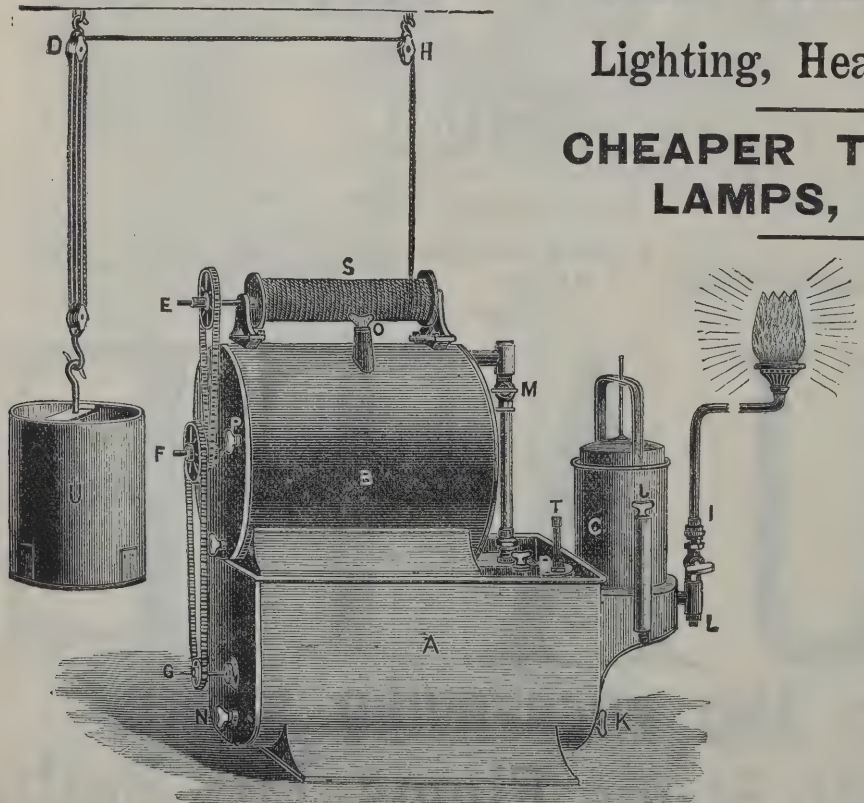
ROBERT DINNIE, MASON AND ARCHÆOLOGIST.

MR. ROBERT DINNIE, poet, author and antiquarian, and father of the famous athlete, Donald Dinnie, died on October 29 at Wood Cottage, near the village of Kincardine O'Neil. Perhaps no one was better known in his day and generation on Deeside, says the *Aberdeen Free Press*, than Mr. Dinnie, and probably no name is more familiar in the athletic world than his through the physical prowess of his son, who has for so long carried the palm at every athletic meeting, not only in Scotland but wherever Scotsmen gather. In the death of Robert Dinnie or, as he was more familiarly called by his immediate neighbours, Robbie Dinnie, a character of no mean note has passed away, and one of the few remaining links between the past and present has disappeared. Robert Dinnie was not only noteworthy as the progenitor of the world's champion athlete, Donald, and a race of giants besides, but he was himself, as far as physical prowess was concerned, a giant, although the idea of winning fame by such in the public arena was as antagonistic to his nature as idleness was to his active life. As a country mason he boasted that in the heyday of his strength he did the ordinary work of two men, and the boast was no empty one, as many who have laboured to him on Deeside testified, and yet in the midst of all this toil he found time to earn a fame of more than mere local renown as a poet, author and antiquarian. He has passed away at the ripe age of eighty-three. He met with an accident a few weeks ago which hastened his end. Robert Dinnie was born in the parish of Birse in 1808, and, after receiving a good elementary education at the parish school, where in the closing days of his school career he acquired a liking for English classics, which developed into a hobby in after years, he served his apprenticeship as a country mason, at which craft he laboured generally on his own account, building farm-houses, steadings, kirks and schools till over the three score years and ten, when age alone compelled him to lay aside the trowel. The monument on Mortlach, near Aboyne, to the late Marquis of Huntly—and the most conspicuous on Deeside—was built by Dinnie, as also the granite Gothic crown at Invermark, where the Queen and Prince Consort rested and took refreshment after crossing Mount Keen on their last excursion from Balmoral together incognito. Most of Mr. Dinnie's "jobs" were to the order of the late Fox Maule, Earl of Dalhousie, and the late laird of Ballogie. These were his chief patrons. Mr. Dinnie's antiquarian knowledge was wide. He early began to make himself acquainted with the traditions and history of the districts in which he lived and worked. He was ever eager to examine old buildings, or coins, or seals, or whatever was ancient or curious, so that from far and near he was regarded as an authority in this line, and his opinion freely asked on any antique "find" or purchase was as freely given. He spared himself no pains or trouble in solving a mystery, and his correspondence in this direction was extensive, his correspondents being not unfrequently the highest authorities in the land. His antiquarian museum, occupying the upper part of his cottage where he resided for the most part of his life, in a wooded glade on the estate of Ballogie, near the banks of the Dee, contained an extensive and valuable collection of "Ferrara" swords, dirks, old Scotch coins, flint arrow-heads, axe-heads, old chairs, old Scotch measures, buttons, tokens and other treasures dear to the heart of the collector, and was at its best some twenty years ago, and since then the rarer specimens have been parted with from time to time till scarcely anything of note now remains to be disposed of. Old castles were a favourite haunt of Robert's in his day, and of these and other ancient and historical buildings, far and near, he had an intimate and probably unique knowledge. His memory, till very recently when weakened by disease, was full and accurate. Once put on the track of a subject, and he would recall the minutest details and exact dates. He had met "Old Dubrach," who was 108 years old at the time when Mr. Dinnie was a boy. This old man was the last of the rebels who were out in '45, and was presented to George IV. on his visit to Edinburgh in 1822 as his last enemy. Thus Dinnie's death severs a very interesting connection with the past, as perhaps he was the last who had ever seen a rebel in the flesh, who had a personal knowledge and connection with the Bonnie Prince Charlie. He utilised his antiquarian knowledge in book form, for he had a strong literary faculty. He produced from time to time "The History of Birse," "The Deeside Guide," "Cauld Kail Het Again," "Stories of Joseph Smith, some time Minister of Birse," and "History of Kincardine O'Neil"—small volumes but rich in local historical lore, and all written after he was

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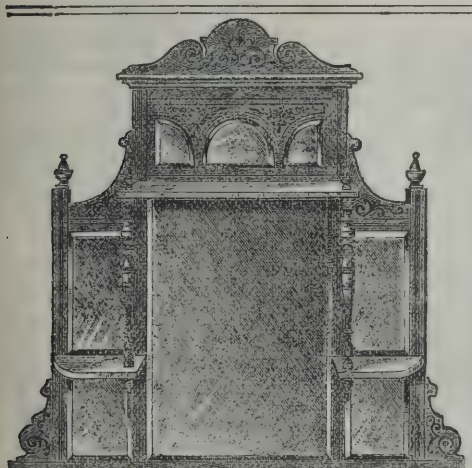
sixty years of age. Most of these are now out of print. He was also a rhymer of no mean ability, and in 1876 he published a volume of "Songs and Poems," which contained what he himself regarded as his better productions, most of them having been written from time to time as the incidents they related cropped up. Perhaps the best piece he ever wrote was his address to the "Auld Kirk of Kincardine O'Niel." In this connection it may be noted that in dress he affected the poet Hogg, for whose writings he had a great admiration. It may be mentioned that all through life, and even to the last almost, his chief food, and which he delighted most in, was water brose, with ale or milk. He was married when twenty-five years of age, his wife being two years his junior, and she predeceased him only a few months ago. They had ten of a family—six sons and four daughters—all of whom are alive. Donald is the eldest of the sons but the third of the family. He was born near the village of Kincardine O'Neil, but in the parish of Aboyne, in the year 1837, and is thus fifty-four years of age. He is at present in Australia, whither he went from America several years ago. The old couple were always proud of their eldest son's achievements, and nothing delighted them more than to talk about Donald's feats with the hammer, the stone or the caber. In keeping with the character of the man, it was only to be expected that he would have all arrangements made, even to the minutest details, in view of his death, and these were from time to time reduced to writing. His head-stone was prepared long ago.

FIRE AT SANDRINGHAM.

THE fire which broke out on Sunday morning at Sandringham, the Norfolk residence of the Prince of Wales, has caused damage that is estimated at from 10,000*l.* to 15,000*l.* The bedroom in which the fire originated is on the nursery floor, nearly at the top of the house. At about 7·30 a letter-carrier named Emmerson saw smoke issuing from the upper storey windows of the main portion of the hall, and immediately communicated the fact to the police-constable on duty, and instantly an alarm was raised. It was soon seen that the whole suite of unoccupied apartments in that part of the building was in flames, and the destruction of the entire building seemed inevitable.

The Prince of Wales purchased the Sandringham estate in 1861 from the Hon. C. Spencer Cowper for 200,000*l.* At that time the house conformed to an ordinary type of old English country residence, and occupied three sides of a square. Soon after His Royal Highness came into possession of the property the house was pulled down, and the present mansion was erected on an enlarged site, the work being completed in 1871. The style was a modification of the form of Elizabethan architecture which appears in many of our manor houses. Comfort rather than luxury seems to have been studied in the arrangements, and with success. The structure extends in length some 500 feet, of which one-half is occupied by the main building, and it is about 60 feet wide. On the ground floor is a continuous suite of dining-rooms, boudoirs, drawing and breakfast-rooms, with a lofty entrance-hall which has served at times as a ball-room, having an enriched gallery at the north end for the orchestra. The decorations of the interior hall and the principal staircases were of English carved oak with enrichments in the Elizabethan style, whilst the drawing-rooms and boudoirs were very delicately and beautifully decorated in the French style. On the first floor were the Queen's Room, the Prince and Princess of Wales's bedroom, the Bamboo-room, the Prince's Cabinet, the White Library, and visitors' and other rooms. The second floor was on iron girders and concrete in order that this suite of apartments might be as fireproof as skill could make them, and it is due to this fact that the whole range of buildings escaped destruction. Upon the third floor were the rooms used by the ladies associated with the royal household. These latter were partly constructed in the open timbered style, and the space beneath the floor and the ceiling below was filled in with sawdust to deaden sound.

The Prince of Wales was expected at Sandringham on Saturday next, and preparations were in active progress for his reception. Fires had been lighted in all parts of the house, and it is surmised that a spark from one of the flues had in some way communicated with the woodwork and had probably been smouldering all night. In about an hour after the alarm was raised the top of the building was all in flames, which could be seen for miles around, and soon after that the roof fell in with a tremendous crash. By 11·30 A.M. the fire was fairly got under. In the meantime a gang of men had been engaged in removing the most valuable goods from the lower rooms and placing them on the lawn, whence they were removed to a place of safety. The upper part of the building and the rooms on the second and third floors were entirely gutted and their contents destroyed, whilst the rooms below were much injured by water. The following are the insurances:—buildings, 59,000*l.*; contents, 68,400*l.*; total, 127,400*l.*



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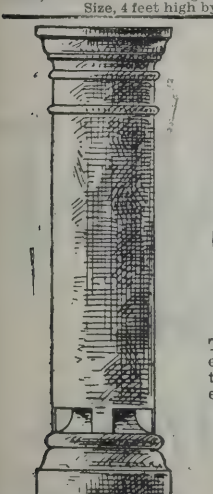
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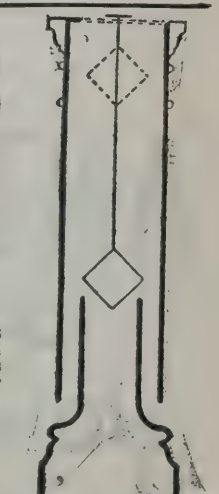
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A later account states that arrangements are being made to restore Sandringham House to such an extent that the festivities connected with the Prince of Wales's jubilee birthday need not be interfered with. One hundred decorators and carpenters are at work repairing and cleaning the interior of the building. A temporary roof of wood and patent sheeting is being constructed over the part damaged by fire, at a sufficient height to admit of the premises being rebuilt without disturbing it. Colonel Edis is arranging for the restoration of the upper storeys of the main building, the damage to which it is now positively asserted will be covered by less than 10,000*l.*

REGISTRATION OF PLUMBERS.

THE Mayor of Londonderry, Mr. A. Baxter, J.P., presided at a public meeting held in the Guildhall, Londonderry, for the purpose of electing a local organisation to carry out the national system of registration of plumbers in that district. There was a large and influential attendance, including Dr. Walter Bernard, Alderman J. B. Johnston, W. J. Robinson, A.M.I.C.E., city surveyor and executive sanitary officer; Councillor J. A. MacCullagh, M.D., consulting officer of health; R. Eccles Buchanan, architect; W. E. Crowther, master of the Science and Art School; and a number of master and operative plumbers, including Mr. Edward Winnington, R.P.C., who attended to represent the District Council at Belfast.

The Chairman, in introducing Mr. Winnington to the meeting, mentioned that the clerk of the Worshipful Company of Plumbers had specially visited Londonderry with Mr. Winnington to make arrangements for that meeting, but had not been able to stay and address them, owing to important engagements in London.

Mr. E. Winnington said the education and registration of plumbers was a great public question. It had been affirmed by the most eminent medical authorities, by architects and by sanitarians generally, that the work of the plumber, if badly done, either in plan, construction or execution, was very dangerous to the health of the community; but that if, on the other hand, it was well done, it contributed very materially to the public comfort and health. In support of this statement, the speaker quoted a number of eminent authorities. Referring to the advantages of registration to the plumbers themselves, he pointed out that it would eventually be of great benefit to them to join the registration movement, as by so doing their trade would in the course of time be elevated to the dignity of a respectable profession, and when good work was required to be done the public would have a reliable list of qualified men whom they could trust to do the work on the most approved sanitary principles. Touching on the question of technical training, Mr. Winnington said it was impossible to separate technical training from the registration movement. The one must necessarily accompany the other.

After an interesting discussion a formal resolution was passed inaugurating a local committee for Londonderry, composed of an equal number of master plumbers, operative plumbers and public representatives, including the Mayor, Dr. Bernard, Dr. MacCullagh, Alderman McLearn, Mr. James Craig, Mr. R. Eccles Buchanan, Mr. W. J. Robinson, Mr. F. G. Ferguson and Mr. W. Barker. Mr. W. E. Crowther, Science and Art School, was appointed secretary *pro tem.*

SOURCES OF THE LONDON WATER-SUPPLY.

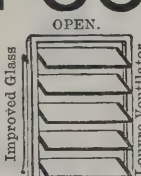
A REPORT has been prepared by Mr. A. R. Binnie, the chief engineer of the London County Council, upon the London Water Supply, with special reference to the quality and quantity to be derived from the Thames and the Lea. Mr. Binnie states that the average quantity of water abstracted from the Thames for the supply of London in 1858 amounted to 35,387,000 gallons per day, and was increased in 1890 to 90,400,000 gallons per day, showing a rise of over 154 per cent. during that period. Looking back to the report of the Royal Commission of 1869, he finds that the quantity authorised to be abstracted at that period was 110,000,000 gallons per diem. Considerable obscurity exists as to how that quantity was authorised, and as to how it has since been increased. That the maximum quantity which may safely be drawn from the river has been reached is shown, Mr. Binnie says, by the fact that the quantities abstracted in August, 1885, amounted on an average to 31¾ per cent. of the total flow, and on August 3 of that year to 37 per cent. of the total volume, and the average quantity abstracted in August, 1887, amounted to 29·65 per cent., and on the 14th of that month to 39·6 per cent. If further abstraction of water is not carefully guarded against, Mr. Binnie fears that a state of things may arise most unpleasant and disastrous to the inhabitants of London. The quantity actually abstracted by the companies averaged for 1890 90,400,000 gallons

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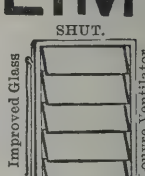
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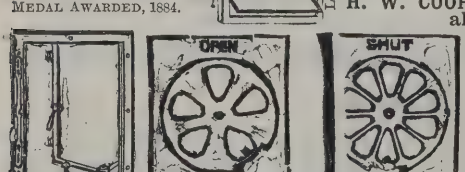
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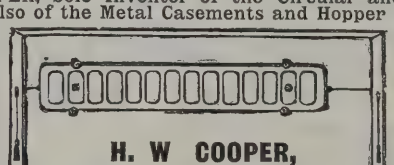
GLASS SELLERS' COMPANY EXHIBITION,



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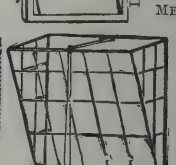
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a day, and in dry weather often exceeded 100,000,000. After discussing the question of the control of existing companies by the Local Government Board, and stating that the powers of control were far more limited than the companies would wish the public to believe, Mr. Binnie deals with the rapid increase of the population of the Thames Valley, living in towns and villages that must inevitably drain directly into the streams and river from which the inhabitants of the metropolis receive their drinking water. Discussing the question of the possible future increase of the supply by means of storage-reservoirs, he says that he can safely say that he knows of no sites in the Thames Valley suitable for storing water for the domestic supply of London. He holds out little hope of obtaining chalk and other spring water in the Thames Valley or of obtaining supplies from the gravel beds there. Coming next to the Lea, the report states that the companies, who claim the right to draw an unlimited quantity of water from that river, actually abstracted from it in 1858 40⅔ million gallons a day, and in 1890 about 72,800,000 gallons a day. Of the latter amount probably 13¼ million gallons were drawn from deep-seated springs by means of wells and pumping. Facts are mentioned to prove that the companies could not draw the full quantity they required from the Lea, and that they already drew more than was desirable, and Mr. Binnie expresses the opinion that the construction of reservoirs in the valley of the Lea would be impossible. The report proceeds to deal with the question of the pollution of the Thames and Lea valleys, and gives details of diseases that have resulted from polluted water supplies at the following among other places:—Lausen, Nagpoor, Madrid, Seville, Valencia, Granada, Theydon Bois (near Epping), Guildford, Lewes, Bangor, Hitchen, Doncaster, and lastly, London. After dealing briefly with the supplies of other large towns, Mr. Binnie concludes thus:—"To my mind the whole question is not one requiring to be elucidated by chemical analysis. I consider that the facts given in this report, supported as they are by the evidence of high authorities, are sufficient to throw deep suspicion on the London water supply, derived as it is from such questionable sources. I cannot but concur with the report of the Royal Commission on the Pollution of Rivers (Domestic Water-supply of Great Britain), 1874, which, in referring to the water-supply of London from the Thames, states at page 429:—'We, therefore, recommend that the Thames should as early as possible be abandoned as a source of water for domestic use, and that the sanction of your Majesty's Government be in the future withheld from all schemes involving the expenditure of more capital for the supply of Thames water to London.' It will now be for the Council very gravely to consider, with these facts before them, what course they will adopt with regard to the future water-supply of London from the rivers Thames and Lea. At present, no doubt, the death-rate of the metropolis is low, and as far as analysis is concerned the water appears to be wholesome. But it has been shown that analysis, without the previous history of the water is taken into account, is no guarantee of purity, and it is evident that the inhabitants of London are living under conditions as to their water-supply which might lead to an outbreak of epidemic disease that for extent and severity would be almost unparalleled in the history of the world. And there are serious reasons, on entirely other grounds, for limiting the supply derivable from the Thames and Lea, even were those waters considered perfectly pure and wholesome."

THE BLACKWALL TUNNEL.

THE subject of the Blackwall Tunnel came before the London County Council this week. The Bridges Committee reported that the Council on October 13 referred to them the following tenders for the construction of this tunnel:—Messrs. Hugh Kennedy & Sons, 1,112,160*l.* 6*s.* 3*d.*; Mr. J. Jackson, 1,018,812*l.*; Mr. W. Webster, 974,580*l.* 8*s.*; Messrs. S. Pearson & Son, 871,000*l.* Messrs. S. Pearson & Son, whose tender was the lowest, were contractors of high standing, and were now engaged in satisfactorily completing the Hudson River Tunnel at New York by compressed air with a pneumatic shield, under the direction of Sir Benjamin Baker, the method of construction being similar to that proposed to be used in constructing the Blackwall Tunnel. The committee recommended that, subject to an estimate being submitted to the Council by the Finance Committee, in accordance with the statute, the tender of Messrs. S. Pearson & Son for the construction of the Blackwall Tunnel, amounting to 871,000*l.*, be accepted, and that the solicitor be instructed to prepare the necessary contract.

Mr. Hunter moved the reception of the report. He stated that three-fifths of the population of the metropolis lived west of London Bridge, and they had twelve bridges constructed at a cost of six and a-half millions sterling. On the east side of London Bridge there were two-fifths of the population, and there were no means of communication at all. Certainly they should shortly have the Tower Bridge, but that was only half a

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mile below London Bridge, and they had the Woolwich Ferry, which was some considerable distance below. The use which had been made of the Woolwich Ferry was one more proof that communications between the north and south sides of the river were urgently required. The principle had been practically accepted, because all other means had been rejected. The Council had either bought or entered into arrangements for the purchase of property of the value of 365,000*l.*, and if the tunnel scheme were abandoned that would have to be sold at ruinous loss. They had a tender from practical contractors experienced in the work, and in the public interest it was desirable that the question should be settled at once.

Mr. Myer was anxious to see improved accommodation between the banks of the river, but he asked whether such improvements as the widening of the Strand, Bozier's Court, the new street from Holborn to the river, and other pressing improvements were to be put aside while they were spending an enormous sum in carrying out this tunnel, which he predicted would be a failure. He moved as an amendment :—"That inasmuch as there are greater and more important improvements absolutely necessary nearer central London (and which, if effected, would cost considerably less), this Council adheres to its former declared policy of not undertaking further improvements until the incidence of taxation is altered so as to place the burden of the cost upon those who derive the benefit, viz. the owners of the land in the immediate district, the Council, therefore, regrets that, although it is desirous of effecting a communication across the river at Blackwall, it cannot at present proceed with so gigantic an undertaking."

Mr. Arthur Arnold, who seconded the amendment, questioned whether the tunnel would be of much use for heavy traffic, because the gradients as now proposed involved a descent of 72 feet, whereas the height of the Tower Bridge over high-water mark was 33 feet, and, therefore, would be preferred by drivers. The Woolwich Ferry experiment had been most successful, and they might try a ferry at this place instead of constructing a tunnel, which was doomed to be a wasteful failure. If they had a million of money to spend why should they delay the Strand improvement, which was much more pressing than this?

Mr. Collard contended that the tunnel was altogether unnecessary in this neighbourhood.

Mr. Lidgett said it was nearly three years since their predecessors declined to construct this tunnel, and the Council were bound to proceed with it. All the population in the East End of London were in favour of it, knowing what an enormous gain it would be to them if they could pass from one side of the river to the other by a road which should be open and lighted day and night.

Mr. Beachcroft was opposed to the tunnel, but they had now gone so far that they could not retreat. In good faith they were bound to go on and carry out the project which they had already decided upon.

Mr. Burns pointed out that, though those using the tunnel would have to descend 72 feet, they would, if they used the Tower Bridge, have to make a journey of five miles on each side of the river, and, therefore, if the gradient of the tunnel were made moderately easy, it would be used for all heavy traffic in the locality. The industries of the district could not be developed, in his opinion, by a ferry.

The amendment was then put and negatived by a large majority.

Mr. Saunders then moved the following amendment :—"That, as the lowest tender for a single tunnel is far in excess of the Parliamentary estimate, the tender be not accepted, and that it be referred to the Bridges Committee to take advice as to the possibility of reducing the cost and improving the communication by the adoption of shafts and lifts instead of inclines." He contended that the system of lifts would effect an enormous saving of expense and would give them a much more satisfactory tunnel.

The amendment was rejected and the recommendation of the committee agreed to, only eight members dissenting.

THE ARTESIAN WELL IN THE CITY.

AT the last meeting of the City Commission of Sewers Colonel Haywood reported that the artesian well at the Artisans' Dwellings in the Minories had been bored to an additional depth of 100 feet, making 450 feet in all, the average daily yield being 50,000 gallons. He recommended that the boring should be continued for another 100 feet deep. Mr. Malthouse said he did not intend that this new supply of water—which was independent of the companies—should be confined to the Artisans' Dwellings alone. It might be the means of supplying the surrounding district and the commencement of a new supply for the whole City, but, at all events, it would be a great factor in considering the value of the water companies' property when any purchase was in contemplation. He moved that the

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additional 100 feet recommended by the engineer should be bored. The engineer said the cost would be 1*l.* 10*s.* per foot. Mr. Wallace suggested that there was a danger in such additional boring, as the supply might suddenly cease. Mr. Sly said there might be matters of a legal and an engineering character which it would be desirable to inquire into before proceeding further. Mr. Deputy Bedford said the water companies had no monopoly in the City of London, whatever might be their position outside. Mr. Malthouse said there was no fear of a cessation in the supply, as the water-bearing strata went to a great depth. The motion was carried, and it was further arranged that Dr. Sedgwick Saunders, the medical officer, should analyse the water and make a report as to the result at the next meeting.

THE INCIDENCE OF TAXATION.

The Local Government and Taxation Committee of the London County Council have presented a report which has been prepared by a sub-committee containing an elaborate exposition of the law on the subject of rating as applicable to London, and an examination of various principles connected with it and of various methods proposed for its reform. The committee, at the conclusion of their report, summed up the propositions which seemed to them to be correct as follows :—

1. Some portion of the burden of the rates should be thrown on owners as distinct from occupiers.
2. All owners, of whatever tenure, whether for years or for life or in fee, should bear their due share.
3. Each owner should be charged upon the present amount of annual benefit accruing to him from the property assessed.
4. Each owner should pay part of the rate collected from the occupier by means of a deduction from his rent, according to the method used in the case of property-tax.
5. Owners should contribute to the rates not only in respect of improvements, but of other purposes.
6. Owners should pay not different proportions of rates levied for different objects, but a fixed proportion of the whole.
7. A fair proportion should be charged upon owners.
8. Half is suggested as a fair proportion.
9. The Council should suggest principles only, without attempting a detailed plan.
10. New taxes may be imposed without regard to private contracts.
11. Contracts which contain no stipulations that the occupier shall pay rates need not be regarded.
12. Future contracts by lessees to pay otherwise than as the law directs should be made void.
13. Future increases of old rates may be treated as new taxes.
14. Rates existing at the date of a contract should be left under the operation of the contract.
15. Rates or increase of rates imposed after the date of the contract and before the change of law require special treatment.
16. Some compromise is necessary, as suggested by the committee of 1870, but it should be more speedy and wider in its operation.

Their present recommendations were :—(*a*) That the Council do accept this report as an exposition of many questions relating to local taxation in London, and as propounding principles of reform worthy of the attention of Parliament. (*b*) That the report, if adopted by the Council, and the accompanying papers be sent to the Local Government Board, the vestries and district boards, the City Commissioners of Sewers, the boards of guardians, the London School Board and the Asylums Board.

THE CROSS-RIVER BRIDGES OF GLASGOW.

It has been remarked by some one of great discernment as a singular, but singularly fortunate, accident that rivers should so often flow past large towns. For no city in the kingdom, says the *Glasgow Herald*, has "accident" been more fortunate in that respect than for Glasgow. The stream of Clyde is not pellucid, but it has borne us along to fortune, and it intersects what is now admittedly the second city of the kingdom—although hardly the second city of an Empire which includes India. This matter of intersection, though, is one of the results of the "accident" of riverine courses. Once upon a time the Clyde flowed more or less tranquilly past Glasgow; now it flows through it. The history of a people, it has been said, is written in the stone of its buildings and monuments. The history of industrial Glasgow is written largely in its bridges, and it is worth a retrospective view at a time when one chapter of it is about to be rewritten. At the present day, between the eastern boundary of the city and the open harbour, the river is spanned by nine separate bridges, all within the

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limits of the municipality. Forty-four years ago, when James Pagan wrote his "Sketch of the History of Glasgow," there were only four, of which one was an accommodation bridge.

The first bridge of which there is any tradition—it can scarcely be called a record, since it is only referred to incidentally in a charter of 1258, quoted by Dr. Macgeorge in his "Old Glasgow"—was a wooden one, which in the later years of the thirteenth century is believed to have spanned the river at or near the foot of what is now the Saltmarket. Cleland's "Annals" mention that Sir William Wallace, with three hundred horsemen, rode by night from Ayr, and "arrived in the morning at the Bridge of Glasgow, which at that time was constructed of timber." This, like other references of the sort, is vague, but there is no doubt that in 1345 was founded what was for centuries to be known distinctively as "Glasgow Bridge." As originally built, it was a stone viaduct, with eight arches some 12 feet in width, and it was constructed at the charge of Bishop Rae near the foot of what is now Stockwell Street. According to M'Ure, the Bishop built seven of the arches, and "the Lady Lochew" the other, being the third arch at the north end. It was this Bishop Rae who procured from the Apostolic See a dispensation for legalising the marriage between Robert II. and Elizabeth More, "notwithstanding of their affinity and consanguinity," in return for which friendly office Robert founded a chaplaincy in the Cathedral Church.

The good bishop's bridge (of which Macgeorge reproduces two excellent views) must have been substantial enough, though so narrow, as Pagan says, as to make two wheelbarrows tremble when they met, for it lasted until the year 1671, when the southernmost arch suddenly fell on one of the days of Glasgow Fair. Concerning this disaster M'Ure wrote (1736):—"There was much of the care by Providence observed with regard to the fall of the arch, for it was the seventh of July, the very day of Glasgow fair, and about twelve of the clock, and though hundreds, yea, I may venture to say thousands, had pass'd and repass'd, both of horse and foot, yet not one single person got the least harm, which was wonderful, all circumstances considered, and was such an instance of the kindness of Providence that ought not to be forgotten to latest posterity."

This fallen arch was "quickly rear'd up upon the charges of the community." One hundred years later, viz. in 1777, 10 feet was added to the breadth, and two of the arches on the north side were built up for the double purpose of narrowing the river-channel and protecting the adjacent property from floods. Less than fifty years later, in 1821, a further addition was made under Thomas Telford, who constructed side footpaths on iron framings, which extended the width of the bridge to 34 feet. The length was 415 feet.

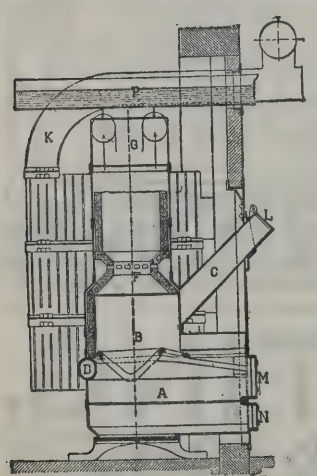
M'Ure speaks of twenty stone bridges in existence in his time, "twelve whereof are within the city, and eight without its liberties," but this does not of course mean bridges across the Clyde. Indeed for more than four hundred years—that is to say, down to 1772, when the Broomielaw Bridge was opened—the old Glasgow Bridge of Bishop Rae was the only roadway between the north and south banks of the Clyde within the precincts of Glasgow. "It has rang under the hoofs of a Scottish king's charger, and been pressed by the bare feet of the Highland host; the Regent Murray with his infantry, and a strong auxiliary force of Glasgow burghers, crossed it to shatter the last hopes of Queen Mary at Langside. Cromwell and his troopers, if they did not use it, must have admired it, for stone bridges were at a premium in those days; the luckless James II., when Duke of York, was lodged and fêted sumptuously by Provost Bell within a stonethrow of it; and it was of no small service to his descendant, Charles Edward, and his foraging parties during the ten days he recruited in Glasgow previous to the fatal field of Culloden."

So summarises Pagan, and, continuing his retrospect, remarks:—"How many tales could it tell of the dignity of the princely churchmen of Glasgow, in days ere Archbishop Beaton fled with the relics, the records and the golden candlesticks, and how eloquent could it be on the thousands upon thousands sterling which have been received in doles and mites by the generations of beggars who thirled themselves on its pathway, with their blindness and age and deformities and loathsome sores and troops of orphan children lent at so much a day!"

This Stockwell or Glasgow Bridge might have lasted for other two hundred years, as far as masonry was concerned, but the deepening of the river by the Clyde Trustees imperilled the foundations of the piers, and about 1845 it was condemned by the engineers as unsafe. At all events, in that year an Act of Parliament was obtained for rebuilding it, and a wooden accommodation bridge was erected alongside the old structure at a cost of 3,149*l.* 5*s.* 6*d.* In January 1847 the Stockwell Bridge, the historic "Auld Brig o' Glasgow," was closed against vehicles by the erection of an iron railing across the carriageway, and before the end of 1850 it was completely pulled down.

Of the Auld Brig o' Glasgow it should be mentioned that it was not on a line with Stockwell Street, but at an angle, built with a view more to the convenience of the Bridgegate than of

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the Stockwell traffic. Moreover, it was not on a level, but rose to the centre by a somewhat steep ascent. Senex, who contributed so many interesting items of the history of Glasgow to the *Herald* some sixty years ago, mentions in "Old Glasgow and its Environs" that, as a boy, he crossed the Auld Brig of Bishop Rae in 1778 at the time when it was being widened. He says that it was furnished with two recesses on the east side, in which foot-passengers could take shelter from skittish horses and from passing vehicles, there being no side-walks before it was widened.

Some doubt about the security of the bridge in 1765 caused the magistrates of Glasgow to issue an order closing it against heavy carts and waggons, although accommodating "gentlemen and others passing along the said bridge in coaches and chaises." This shut off the Rutherglen people from the city—as the Rutherglen Bridge was not built until 1776—unless they crossed by the ford alongside the bridge or by the Dalmarnock Ford higher up. The magistrates of Rutherglen, therefore, brought an action of damages against the magistrates of Glasgow for shutting up the bridge. They gained in the Outer House, and the magistrates of Glasgow, after reclaiming, withdrew their appeal and reopened the bridge. It was this action and the popular dissatisfaction it created, which, according to Senex, led to the decision to build an additional bridge at the foot of Jamaica Street.

Rutherglen Bridge, built in 1775–76, is said to have cost only 1,800*l.*, of which 1,000*l.* was contributed by the royal burgh.

To finish the story of the Stockwell Bridge, the curious will find a long and interesting account of the demolition of the old structure and a comparison between it and the new bridge given by Mr. James Pagan in "Glasgow Past and Present," reprinted from the *Herald* of 1850. We gather from this that the contract price for the new bridge, taken by Mr. York, then Deacon-Convener, was to be 36,000*l.*, with 1,000*l.* to Mr. Walker, the designer and engineer, and 250*l.* per annum during construction to a resident engineer. The bridge, still familiarly called the Stockwell, but officially the Victoria, actually cost about 40,000*l.* It is of grey granite, in five arches of from 70 to 80 feet each, is 450 feet long and 69 feet wide, and was opened to traffic in 1854.

The origin of the Broomielaw, or New Bridge, as it was long called, has just been stated. The foundation-stone was laid on September 29, 1768, by Lord Provost George Murdoch—George III.'s "handsome Scotchman." Cleland records that the ceremony was one of much Masonic solemnity, and that an imposing procession set forth for the site from the Saracen's Head Inn. The Lord Provost officiated as Acting Grand Master of the Western district, but Cleland states that as he had not received a regular Masonic appointment from the Grand Lodge, the Grand Master afterwards "threatened him with Masonic censure." What succeeded this awful threat the historian has not recorded, but it will be as well that the officiating personage at the proposed new bridge should keep the dreadful incident in remembrance. The arches of this first Jamaica Bridge were finished, according to Cleland, in 1771, and the first carriage passed over it on January 2, 1772. It was designed by William Mylne or Milne (the designer of old Blackfriars Bridge, London), had seven arches, was 500 feet long and 30 feet wide between the parapets.

With regard to this bridge, however, it would seem that Milne's was not the first roadway over the Clyde at this point. In some notes by Senex in the *Glasgow Herald* of November 14, 1853 (reprinted in "Glasgow Past and Present"), appears the following extract from the *Weekly Magazine* of 1771:—"May 24.—By a letter from Glasgow we are informed that ever since Thursday morning last they have had almost a continued heavy rain, which has swelled the Clyde to a greater degree than has been known these many years past. On Saturday the temporary bridge adjoining to the bridge now building was entirely carried off by the flood, and the timber and supports erected for building the great centre arch of the (stone) bridge have likewise been entirely swept away." From this it would appear that there was then a temporary wooden bridge across somewhere on the line of the present Broomielaw Bridge.

We have not come across any record of the cost of Milne's bridge, but large as the bridge was esteemed it soon proved inadequate for the growing traffic of the city, besides which it had objectionable gradients. It was scarcely more than fifty years old when the necessity for a better erection began to be discussed, and about 1831 or 1832 the Bridge Trustees employed Thomas Telford to design the very handsome structure which still remains, but which is about to be removed to make room for one still larger. Telford's bridge was built by John Gibb & Son, of Aberdeen, and is cased with Aberdeen granite. The foundations are 10 feet deeper than those of its predecessor, and it is also 60 feet longer. There are seven arches, and the width, 60 feet over the parapets, was the greatest of any bridge in the country at the time it was built. The foundation-stone was laid on September 3, 1833, by Lord Provost James Ewing

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"with great Masonic pomp," and it is to be hoped he was more careful than his predecessor to see that his credentials were in order. It cost 34,000*l.*, and 4,000*l.* more was paid as compensation to owners and tenants of houses and lands, making a total somewhat less than the cost of the new Stockwell Bridge.

Some twenty years after the completion of Milne's Jamaica or Broomielaw Bridge the necessity was felt for a bridge east of the Stockwell Bridge, to connect the Saltmarket with Hutchesontown. To this scheme the patrons of Hutcheson's Hospital subscribed 2,000*l.*, and in 1794 the foundation-stone was laid by Lord Provost Gilbert Hamilton. In the course of the following year the work was so far advanced that the arches were completed and the parapets nearly finished when, on November 18, 1795, a tremendous spate, which flooded the whole of the lower part of the city, carried away the bridge bodily. This bridge was designed with five arches of a length of 406 feet (Cleland says 410), and a breadth of 26 feet within the parapets.

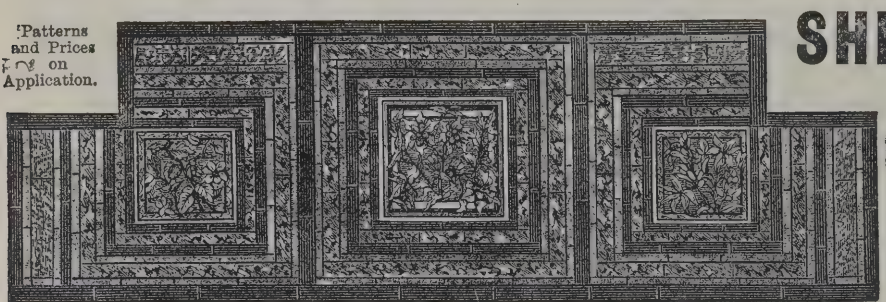
Concerning this unfortunate erection the following occurs in the history of Hutcheson's Hospital:—"The whole cost of the bridge was only 6,000*l.*, and there is too much reason to believe that the specification was altogether defective, and that no adequate structure could have been obtained for that sum. The contractor, however, a Mr. John Robertson, had given security for completing the work, and, according to the usual practice of that period, he undertook all risks and defects of the specification, of which he was presumed the most competent judge, and was bound to deliver a good and sufficient structure for the purpose required, and to uphold and maintain its stability for a limited number of years. The building had not been taken off his hands as complete when it fell during a flood nearly as great as that which occurred in the river in 1782. Mr. Robertson and his cautioners honourably fulfilled the engagement they had undertaken, and the Hospital received back all the advances which they, along with the Town Council, had made for the work."

The town thus lost nothing by the catastrophe, although one cannot but feel sorry for poor Robertson, who so "honourably fulfilled his engagements." The bed of the river was so "pooled" by the accident that it was deemed unwise to attempt a new stone bridge, so a wooden bridge, for foot passengers only, was thrown across at the foot of the Saltmarket in 1803. According to Cleland, this foot-bridge had eight supports and breakwaters, and cost 1,200*l.*, towards which, their records show, the patrons of the Hospital subscribed 200*l.* The annals of the Hospital record that this wooden affair was "from an elegant and much-admired design of Mr. Peter Nicholson, architect," but that before the year 1824 it became unsafe, "from the severe effects of the ice-floods and other causes." The records contain a long account of the negotiations, doubts and difficulties in planning for a new stone bridge, but at last, on August 18, 1829, the foundation-stone was laid of what was to be known as the Hutcheson's Bridge by Mr. Robert Dalglish, preceptor of the Hospital. It had five arches, was 406 feet long and 36 feet wide within the parapets. It was designed by Rennie, and was to have cost about 15,000*l.*, but the contractor failed during its construction and had to be assisted, so that the ultimate cost, including Parliamentary expenses and the making of approaches, &c., was about 31,000*l.* It was completed and opened in 1834, and a few years later it was "consolidated" in the Bridge Trust under which the Stockwell and Jamaica Bridges were being administered.

Eventful, however, as was the life of the Hutcheson Bridge, it was a short one. By the year 1868 it was deemed not only inadequate for the traffic but also insecure, and was closed to the public. Thereupon began the construction of that remarkably handsome structure now known as the Albert Bridge, which crosses the river in three splendid arches, one of 114 feet and the others of 108 feet each. It is 410 feet long and 60 feet wide. The foundations are of cast-iron cylinders filled with concrete, sunk deep in the bed of the river, and the piers and abutments are of red and white granite. This bridge was opened for traffic in 1871, and its entire cost, including approaches and street alterations, was 65,000*l.*, by far the largest amount as yet expended on any bridge in Glasgow.

We must now go back to Telford's (present) Broomielaw Bridge for the next development. While that handsome structure was in course of erection on the site of Milne's bridge, a wooden accommodation bridge was erected to the west of it on a line with Portland Street—on the very line, in short, which is now being discussed for an additional stone bridge. For some years after the new Broomielaw Bridge was completed, the wooden bridge at Portland Street remained in use, but about 1846 the timbers showed signs of decay, and it was taken down. The convenience of a bridge at this point was, nevertheless, too obvious to be neglected, and after an interval of a few years the present Suspension Bridge was constructed. It was opened in 1853, and altered and improved in 1870–71, but although elegant and useful enough in its way, it is only adapted

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for passenger traffic. The original cost, according to Mr. James Pagan ("Glasgow Past and Present," from *The Herald* of November 1849) was to be between 6,000*l.* and 8,000*l.* That the estimates were exceeded may be concluded from the following note in the valuable introduction by the late Mr. John Carrick, city architect, to the volumes of Senex :—"It was not without difficulty that the present bridge was raised. Owing to insufficiency of estimates, and defects arising from bad materials and workmanship, the first towers had to be taken down and rebuilt, and for a long time grave doubts were entertained as to its stability. When the Bridge Trustees assumed the care of the city bridges, however, it underwent a thorough examination, was properly strengthened, and is now a satisfactory and substantial structure." The Suspension Bridge, it should be mentioned, was erected by the leading proprietors, principally on the south side, who took powers to levy a pontage, while supplying their own tenants with free pass-tickets.

The St. Andrews Suspension Bridge, between the Green and M'Neil Street, was erected in 1856 for the convenience of the people of the Bridgeton district going to and from their work. It is, of course, for foot passengers only.

Cleland's "Annals" make mention of "a free bridge" built across the Clyde in 1776 on the west end of Rutherglen. This is the present Rutherglen Bridge, which is therefore the oldest river bridge now within the area of Glasgow, although already doomed to demolition. It is said to be a fair copy of the Auld Brig o' Glasgow, with its five (instead of eight) arches and steep gradient, and it cost under 2,000*l.* About a mile and a half above this was the old wooden Dalmarnock Bridge, also connecting the east of Glasgow with the royal burgh, which was removed in 1888 to make way for the new iron bridge opened in the present year.

This, then, finishes our brief record of the history of the public bridges across the Clyde within the boundaries of the city. But besides these there are the gigantic and not wholly admirable structures belonging to the railway companies. The St. Enoch Bridge, massive though plain—not to say ugly—was opened in 1870. It has five river spans of 75 feet each, and two street spans of 65 feet each. It cost 38,000*l.* The Caledonian Railway Bridge, the most western of all the cross-river erections, was opened in 1879. It has three river spans and two street spans, the longest being 200 feet, and the entire length of the bridge 710 feet. It is impossible to say what has been the actual cost of this bridge, with the numerous alterations and enlargements of its approaches.

LONDON BOARD SCHOOLS.

THE action taken by the School Board for London against Mr. Johnson, builder, claiming damages for breach of contract, came before Mr. Justice Denman on Saturday. The contracts were :—(1) June 16, 1885, for the erection of a school in St. Andrew's Street, Wandsworth ; (2) June 23, 1885, for the erection of a school in St. Dunstan's Road, formerly called Biscay Road, Fulham ; and (3) January 2, 1885, for the erection of a schoolhouse in Eglinton Road, Plumstead. The plaintiffs allege that defendant was guilty of fraud, default and wilful deviation. The defendant denied the truth of such allegations, and when the case came on for trial before a jury in May last an order was made by consent of both sides that the following questions should be referred to Mr. H. A. Hunt, architect and surveyor, who was to report to his lordship, whose judgment was to be final. The following were the questions :—(1) Whether defendant was guilty of fraud in carrying out these contracts ; (2) whether the defendant was guilty of scamping the work with a view to his own interest ; (3) whether the defendant was guilty of wilful deviation from the contract in the sense of intentional and substantial departure from the contract with a view to his own interest ; (4) to what amount, if any, are the buildings the worse for the defects consequent on the defendant so being guilty of each of the three previously-named breaches, if any, and (if not necessary to replace) what the defendant has saved by such breaches ; (5) whether any or which of the aforesaid breaches were discovered within four years of the completion.

After hearing the arguments of counsel on both sides the following answers from the report of Mr. Hunt were read :—"(1) The defendant was not personally guilty of fraud, but to a small extent a plumber was guilty in laying light lead in the gutters to the amount of 7 cwt., of the value of 5*l.* 5*s.*; (2) the work 'generally' has been well done, notably the leadwork, the joiners' work, the plasterers' work, the brick and stone work, and although there are serious failures in the drainage work of at least one school, I do not consider that, as a whole, the work has been scamped ; (3) there have been substantial departures from the contract (*a*) with the full cognisance of, or to comply with the wishes or orders of, the clerks of the works, such as the laying of the secret gutters, the using of one nail instead of two, the omission of the *débris* under the tar-paving and the concrete under the drain-pipes ; these omissions have doubtless put money into the defendant's pocket, but should have been

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adjusted by the measuring surveyors in the usual way; (*b*) there has been a departure in the width of the wall-gutter, although it is difficult to ascertain from the drawings what the width should be, and the specification does not explicitly state the minimum width of a wall-gutter; still I am of opinion that about 20 cwt. of lead has been saved in two of these schools, and 3 cwt. additional put into the third; (4) with the exception of the drainage, I do not consider it necessary to take up and restore any of the work, but I am of opinion that the defendant has saved by the above-mentioned breaches the sum of 240*l.*, and to make good defects which have manifested themselves the sum of 175*l.* should be allowed; (5) I am of opinion that the writ was issued within four years of the date that the clerks of the works certified that the schools were finished." The referee, in conclusion, remarked that the defects which had manifested themselves in the buildings could not have existed without the contributory negligence of the School Board and its agents.

His lordship reserved judgment.

THE CORPORATION AND THE WATER SUPPLY.

A SPECIAL meeting of the Court of Common Council was held at Guildhall on Monday, the 2nd inst., when a report of the County Purposes Committee on the subject of the water supply was discussed. The report recommended that the necessary steps should be taken to introduce a Bill in Parliament next session for the following purposes:—(1) To give statutory powers to the joint committee of the Corporation and the London County Council; (2) to authorise that joint committee to give notices to treat to the metropolitan water companies within four years and to make the giving of such notices obligatory at the expiry of that period; (3) to constitute a tribunal to ascertain the price to be paid, and to clothe such tribunal with the fullest powers of inquiring into and deciding upon all such questions as it may consider necessary with a view to purchase; (4) to enable such tribunal to decide as to the purchase by local authorities outside London of the works of distribution within their district, and also to decide as to the supply of water in bulk to such outside authorities; and (5) to pay for the undertakings by stock having the ultimate security of the county rate. These recommendations, especially as to the obligatory purchase of the existing companies and the absence of any provision for a supplementary supply, were warmly opposed at the last meeting.

A further report was presented at the meeting from the County Purposes Committee of the Corporation. They stated that they had received in conference a deputation of the London County Council. The deputation stated that they were unable to agree to the recommendations of the report as a whole, but they expressed their views in confirmation of the course mutually agreed upon and placed before the committee of the House of Commons on the Corporation's Bill of last session, adding their very earnest desire to continue their co-operation with the Corporation, and suggesting the reintroduction of the agreed Bill of last session. In these circumstances the committee resolved that, having heard the views of the deputation of the London County Council that the agreed Bill of last session should be reintroduced, the committee were prepared to recommend the adoption of that course. They therefore suggested that they should be authorised forthwith to take all necessary steps for the reintroduction of the Bill.

Mr. Deputy Rose-Innes, in moving the adoption of this report, said the Bill of last session was drawn up on a basis accepted by the Corporation and the County Council, and provided for the appointment of a statutory water committee of the two bodies, who should have power to promote Bills for a new supply of water or the purchase of the existing companies, or both, taking a limit of time if forced to do so. The costs of the Act and the administration of the committee and the promotion of the Bill would fall on the county rate. The supply of water in each district in the metropolitan water area outside the county of London would be as far as practicable in the hands of the local authority of each district, and within the county of London in the hands of the statutory committee, who would have full power over details, but questions of principle and policy would be reserved for the London County Council. The result of that fresh report would be the abandonment of the proposed four years' limit. He would undertake to lay the draft of the Bill on the table of the Court before it was submitted to Parliament, but meanwhile it was important that the necessary notices should be at once given. Replying to questions, Mr. Rose-Innes stated that the Bill proposed a commission to inquire fully into the conditions of the existing supply, and, in view of the purchase, to open up negotiations with the present companies and others, and also to prepare a scheme for a fresh supply if necessary. On the proposed water committee seven-eighths of the members should be appointed by the County Council and one-eighth by the Corporation. If the Bill passed, the expenses of its promotion

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would come from the county rate; if it failed, the cost would be borne by the Corporation, as the County Council had no power to promote Bills.

Mr. H. Hicks said the Court was embarking on a course pregnant with peril to the finances of the Corporation. It would be much better if the Corporation, instead of embarking upon unlimited expense, confined its proceedings first to the City, and, if successful, they could be then extended to greater London. As an amendment to the adoption of the report he moved that the report should lie on the table, and that it be referred to the County Purposes Committee to give notice of the Corporation's opposition to any Water Bill or Bills that might be introduced into Parliament, in order that they might be amended in the interests of the ratepayers and water consumers, and that they be instructed to inquire and report forthwith upon the desirability of introducing a Bill in Parliament for the purpose of placing the water rates in the City on a juster and more equitable basis.

Major Joseph seconded the amendment.

Mr. Goldney, the Remembrancer, replying to questions, said that November 20 was the latest possible day for giving notice of the Bill. If the Bill was thrown out on the second reading, the expense of its promotion would be trifling—say 200*l.* or 300*l.*; but if it passed the second reading and was referred to a Select Committee, it would then encounter the opposition of the water companies, and the inquiry might be long; but as far as he could see the expenses of witnesses need not be great, as they could be confined to members and officers of the Corporation and the County Council.

In the discussion which ensued, Mr. Price said that at present it would require upwards of 40 millions to pay out the water companies. The Committee should therefore be careful how they proposed dealing in that respect. Mr. Deputy Bedford supported the amendment, and asked what chance existed of the Bill as proposed passing the ordeal of a Select Committee, looking to the manner in which it was dealt with last session.

The amendment of Mr. Hicks was negatived, and the adoption of the committee's last report was agreed to by a large majority.

At the meeting of the London County Council, the vice-chairman said :—I have the satisfaction of stating that after the communication between a deputation from the Water Committee and a deputation from the County Purposes Committee of the City, the City agreed entirely with our proposals. In other words, what they agreed to was that the Bill that we jointly introduce should be a Bill framed on the lines of the agreement between the City and the Council last summer, and of which the Council is already aware. And I will mention that there is no provision whatever for purchase by arbitration or for any other purchase compulsorily on this Council, or the City, or the proposed water committee. With regard to the application to the Government, I have also the satisfaction of stating that a reply has been received by the chairman from Lord Salisbury stating that the Government have the subject of the water-supply under their very serious consideration.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

Applications for Patents.

17837. Timothy William McGrath, for "Improvements in combination locks."

17878. August Schmidt, for "Improvements in window-frames."

18007. Geo. Goldsmith, Samuel Riley and John Thomson Stephen, for "The Never-fail ventilator."

18077. Wm. Hy. Lindsay, for "Improvements in the construction of window-sashes."

18087. Patrick Morgan, for "An improvement in window-sash lines."

18142. Frederick Tenney, for "A Venetian blind clip."

18173. Saml. Stevens Hellyer, for "Improvements in water-closets and other sanitary appliances."

18187. Wm. Vears Corbett, for "Improvements in keys for locks."

18266. Hy. Harris Lake, for "Improvements in latches." (Oscar le Grand Noble, United States.)

18311. Laurence Seagar, for "Improvements in or connected with window-sashes, doors and the like."

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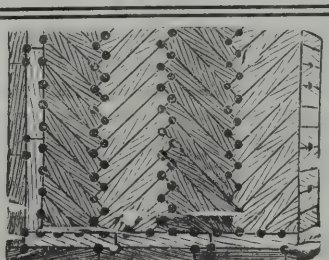
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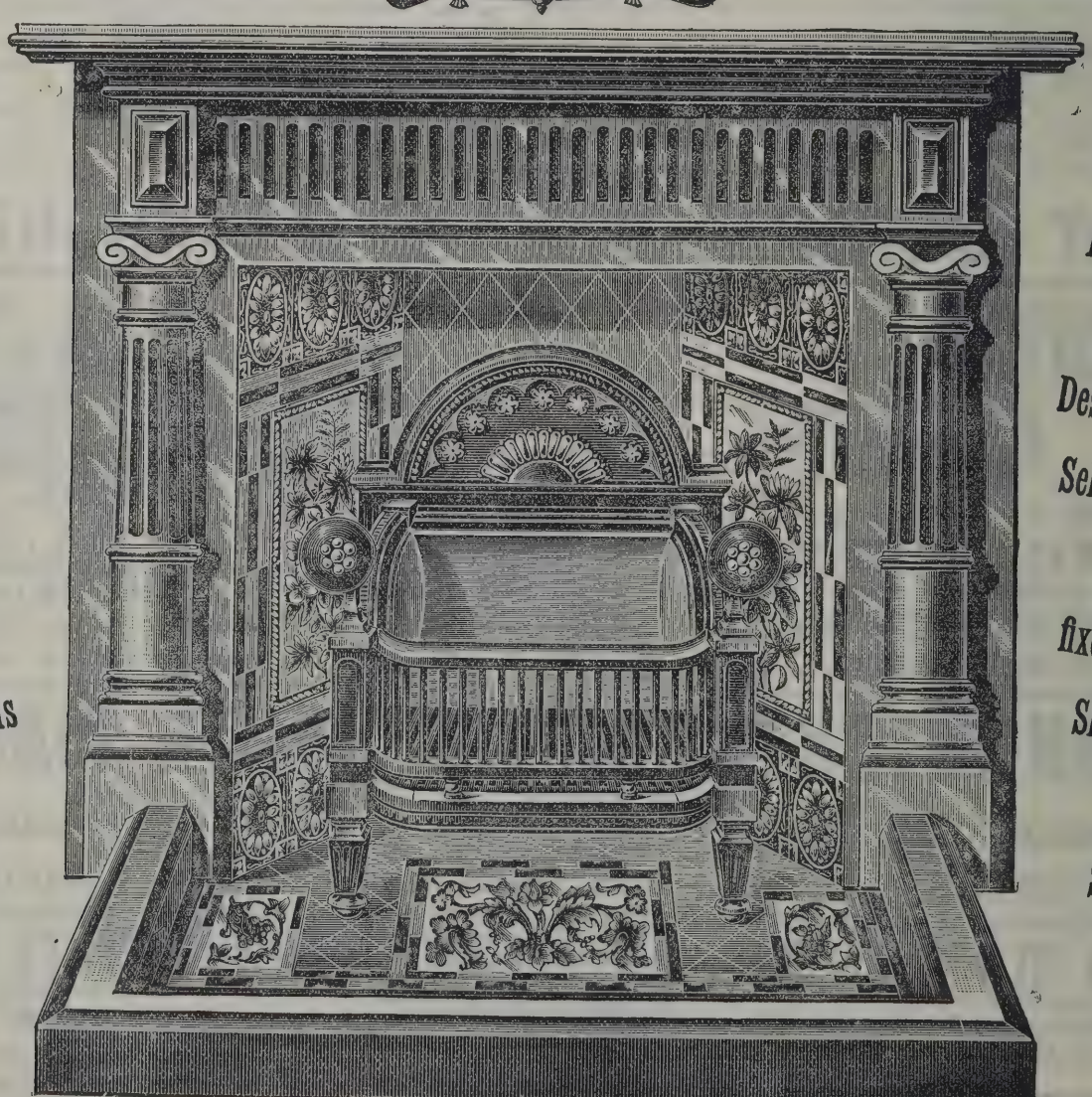
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A Business Supplement

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to The Architect.

LONDON, NOVEMBER 13, 1891.

COMPETITIONS OPEN.

BELFAST.—Jan. 1, 1892.—Competitive Plans are invited for a Hospital for Diseases of the Chest. Details can be had from Mr. F. Howard Sinclair, M.D., hon. sec. med. staff, 76 Pakenham Place, Belfast. Plans to be sent in in a sealed envelope, accompanied by a motto.

BURTON-ON-TRENT.—Nov. 21.—Designs are invited for Truant School. Mr. W N. Graham, School Board Offices, Burton-on-Trent.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

LICHFIELD.—Nov. 21.—Designs are invited for proposed Truant School. Mr. W. N. Graham, School Board Offices, Burton-on-Trent.

SUNDERLAND.—Designs and Estimates are invited for Lunatic Asylum. Prizes of 100*l*., 75*l*. and 50*l*. Mr. F. M. Bowey, Town Hall, Sunderland.

CONTRACTS OPEN.

ABERDEEN.—Nov. 23.—For Construction of Timber Wharf, Albert Basin. Mr. Wm. Smith, Harbour Engineer, 15 Regent Quay, Aberdeen.

ABERGAVENNY.—For Rebuilding Premises, Castle Street. Mr. E. A. Johnson, Architect, Abergavenny.

ALLERTON.—Nov. 18.—For Building Pair of Houses. Messrs. Fairbank & Wall, Architects, Craven Bank Chambers, Bradford.

ARMLEY.—Nov. 23.—For Greenhouse at Cemetery. Mr. E. Butler, Clerk, Victoria Road, Morley.

BARROW-IN-FURNESS.—Nov. 16.—For Construction of Temporary Weights and Measures Office. The Borough Engineer.

BARRY DOCK.—Nov. 14.—For Constructing Lock. Mr. J. Wolff Barry, 21 Delahay Street, Westminster, S.W.

BATLEY.—Nov. 13.—For Building Two Blocks of Model Dwelling-houses, Purlwell. Mr. H. B. Buckley, Architect, Old Vicarage, Batley.

BATLEY.—Nov. 30.—For Building Public Baths. Mr. Walter Hanstock, Branch Road, Batley.

BEXLEY.—Nov. 24.—For Constructing Pipe Sewers. Messrs. A. Williams & Son, 18 Great George Street, Westminster.

BIRDWELL.—Nov. 18.—For Building Board Schools and Master's House. Messrs. Senior & Clegg, Architects, 15 Regent Street, Barnsley.

BRADFORD.—Nov. 14.—For Building Thirteen Houses, Stabling, Coachhouse, &c. Mr. J. H. Holmes, Architect, Dudley Hill, Bradford.

BRADFORD.—Nov. 20.—For Shop Premises, &c. Mr Rhodes Calvert, Architect, 4 Forster Square, Bradford.

BOW.—Nov. 14.—For Repairing, Painting and Cleaning at Abbey Mills Pumping Station. Architect's Department, County Hall, Spring Gardens, S.W.

BURNLEY.—Nov. 24.—For Construction of Filtration Areas, Conduits, Under-drains, Effluent Outfalls, &c. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

CAMBERWELL.—Nov. 16.—For Paving New Streets. Mr. G. W. Marsden, Vestry Hall, Camberwell, S.E.

CARDIFF.—Nov. 18.—For Building District Police Station, East Moors. Mr. W. Harpur, Town Hall, Cardiff.

CARDIFF.—Nov. 19.—For Building Premises for Messrs. Morgan & Co. Mr. Peter Price, Architect, 20 High Street, Cardiff.

CARLISLE.—Nov. 16.—For Extension of Port Road Tan Works and Building Chimney Shaft (100 feet high). Mr. T. Taylor Scott, Architect, 14 Bank Street, Carlisle.

CHARLTON.—Nov. 17.—For Supplying and Fixing Wrought-iron Fencing. Architect, London Count y Council, Spring Gardens, S.W.

CHARMINSTER.—Dec. 2.—For Erecting New Buildings at Dorset County Asylum. Mr. Thomas Coombs, 5 South Street, Dorchester.

CLEVEDON.—Nov. 30.—For Constructing Pier-head, with Band Stand and Pavilions. Mr. G. N. Abernethy, Engineer, 4 Delahay Street, Westminster, S.W.

DUBLIN.—Nov. 30.—For Taking-down Lattice Bridge and Providing and Erecting New Wrought-iron Plate Girders and Superstructure, also Central Girder and Cross Girders, &c., for Bridge over the Cusher. Mr. W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin.

DUDDING HILL.—Nov. 13.—For Building Six Houses. Mr. W. J. Gutteridge, 42 Poultry, E.C.

DUNDEE.—Dec. 1.—For Cast-iron Pipes and Special Castings and Execution of Works for the Water Commissioners. Mr. George Baxter, Engineer, 7 Euclid Street, Dundee.

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HANWELL.—Nov. 21.—For Construction of Fire Escape Staircases and Supply of Fire Brigade Appliances at the London County Asylum. Mr. R. W. Partridge, 40 Craven Street, Strand, W.C.

HATFIELD.—Nov. 17.—For Construction of Sewerage Works, Stoneware and Concrete Pipe Sewers (3,000 yards), &c. Mr. G. M. Lawford, Engineer, 13 Victoria Street, Westminster.

HELPSTON.—For Additions to School. Mr. J. C. Traylen, Architect, 16 Broad Street, Stamford.

ILKLEY.—Nov. 23.—For Building House. Messrs. Milnes & France, Architects, Bradford.

KING CROSS.—Nov. 14.—For Building Warehouse. Messrs. Lloyd & Son, Architects, George Street, Halifax.

LEEDS.—Nov. 14.—For College Hall, Library, &c., Yorkshire College. Messrs. A. Waterhouse & Son, Architects, 20 New Cavendish Street, London, W.

LICHFIELD.—Nov. 27.—For Building Infirmary. Mr. W. H. Woodroffe, Architect, 214 Great Dover Street, London, S.E.

LONDON.—Nov. 13.—For Constructing Underground Urinals and Water-closets. Mr. Henry Blake, Sewers Office, Guildhall, E.C.

LONDON.—Nov. 16.—For Construction of Large Brick Sewers for the Vestry of St. Pancras. The Clerk to the Vestry, Vestry Hall, Pancras Road, N.W.

LONDON.—Nov. 24.—For Alterations and Additions to London Central Meat Markets. Mr. Henry Blake, Sewers Office, Guildhall.

MELTON MOWBRAY.—Nov. 24.—For Laying-out Cemetery Ground, Building Chapel, Lodge, &c. Mr. R. Barker, Local Board Offices, 5 Sherard Street, Melton Mowbray.

MILLBROOK.—Nov. 16.—For Erection of Farm Buildings, Inswork Barton. Mr. W. N. Richards, Architect, 29 St. Aubyn Street, Devonport.

NELSON.—Nov. 23.—For Joiner and Carpenter Work at New Sewage Works. Mr. J. A. Crowther, Borough Surveyor.

NEWBRIDGE.—Nov. 16.—For Building Cottages. Mr. J. Francis, Leicester House, Newbridge, Mon.

NEWCASTLE-ON-TYNE.—Nov. 18.—For Additional Buildings, Platform, Roofing, &c., at Central Station. Mr. Wm. Bell, Architect, Central Station.

NEWRY.—Nov. 21.—For Building Town Hall and Municipal Offices. Mr. Wm. Batt, M.R.I.A., Garfield Chambers, Royal Avenue, Belfast.

ORMSKIRK.—Nov. 18.—For Constructing Fire-Escape Staircase. Mr. A. Dickinson, 2 Railway Road, Ormskirk.

OVENDEN.—Nov. 20.—For Weaving Shed, Warehouse and Offices. Mr. J. F. Walsh, Architect, Waterhouse Chamber Halifax.

PETERHEAD.—Nov. 24.—For Building Coastguard Station. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

QUEENSBURY.—Nov. 21.—For Building Dwelling-house and Five-Horse Stable. Mr. John Drake, Winterbank, Queensbury.

RUABON.—Jan. 1.—For Building Policeman's House, Upper Ponkey. Major T. J. Leadbetter, County Buildings, Wrexham.

SHIPLEY.—Nov. 18.—For Building Four Houses. Mr. C. E. Marsden, Architect, 3 John Street, Westgate, Bradford.

SOUTHAMPTON.—Nov. 16.—For Two Gas Engines and Pumps for Lifting Sewage. Mr. W. B. G. Bennett, Borough Surveyor.

SOUTHEND.—Nov. 17.—For Paving, Kerbing, and Metalling Roads. Mr. Peter Dodd, Surveyor, Local Board Offices, Clarence Road, Southend.

SUNDERLAND.—Nov. 14.—For Enlarging Board Schools, Southwick. Mr. J. Shields, Architect, 42 Fawcett Street, Sunderland.

SWANSEA.—Nov. 16.—For Block of Buildings at Sanitary Hospital. The Borough Surveyor, 13 Somerset Place, Swansea.

TOOTING.—Nov. 13.—For Fitting-up Baths and Lavatories. Mr. John Waldram, 13 Buckingham Street, W.C.

WEST LOOE.—Nov. 17.—For Building Coast Guard Station. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

WILLESDEN.—Nov. 13.—For Building Six Houses. Mr. W. J. Gutteridge, 42 Poultry, E.C.

WINCHESTER.—Nov. 14.—For Building County Offices. Mr. James Robinson, Architect, County Hall, Winchester.

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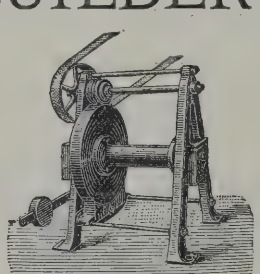


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Portsmouth Water Co., Southsea	2,980 0 0
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T. Hall, Southsea	2,750 0 0
J. Oakes & Co., Wharf Road	2,730 0 0
Biggs, Wall & Co., Fore Street	2,656 0 0
R. Laidlaw & Son, London	2,515 0 0
W. H. Holman & Co., Brighton	2,456 0 0
J. J. Robson, Westminster	2,359 0 0
H. ROBERTS, Smethwick (*accepted*)	2,330 0 0

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Gwynne & Co., London	208 0 0
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R. Dempster & Sons, Lim., Elland	185 0 0
Bryan, Donkin & Co., Lim., Bermondsey	160 0 0
R. Laidlaw & Son, Glasgow	135 0 0
G. WALLER & CO., Southwark (*accepted*)	127 0 0

For Supply and Erection of Scrubber-washer at the Gasworks, Burton-on-Trent.

C. & W. Walker, Donnington	£945 0 0
Kirkham, Hulett & Chandler, Lim.	880 0 0
Ashmore, Benson, Pease & Co., Lim.	879 0 0
W. C. Holmes & Co., Huddersfield	850 0 0
A. Ford, Stockton-on-Tees	830 0 0
Clapham Bros., Keighley	803 0 0
G. Waller & Co.	680 0 0
E. COCKEY & SONS, Lim., Frome Selwood, (*accepted*)	611 0 0
F. Silvester & Co., Newcastle, Staffs	165 0 0

BROADSTAIRS.

For Alterations and Additions to the Burgate, St. Peter's Park, for Mrs. H. M. Ritchie. Messrs. LANGHAM & COLE, Architects, Broadstairs and Ramsgate.

J. E. Barwick	£227 0 0
J. T. MAY (*accepted*)	158 0 0

CARDIFF.

For Extension of Boundary Wall and Railing at Southern end of Howard Gardens, Cardiff. Mr. W. HARPUR, Borough Engineer.

Burton & Co., Cardiff	£169 0 0
Ellis & Davies, Cardiff	160 0 0
T. R. Waterman	142 7 8
W. THOMAS & Co., Cardiff (*accepted*)	128 11 11

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For Building Cottages, Dynas Powis, near Cardiff. Mr. W. H. D. CAPLE, Architect, Cardiff.

H. Welsh, Hereford	£7,790 0 0
Stephens, Bastow & Co., Bristol	7,729 0 0
Evans & Phillips	7,580 15 8
Jenkins & Arnold	7,244 16 0
E. J. Juce	6,727 1 0
Frank Ashley	6,704 3 2
Exors. of W. Gradwell	6,246 11 0
Rutter & Meager	6,225 14 9
Venning Bros.	6,223 14 2
W. REES (*accepted*)	5,609 0 8

EARLESTOWN.

For Building Public Hall and Office, Earlestown, for the Newton Improvement Commissioners. Mr. THOMAS BEESLEY, Architect, Bold Street, Warrington.

Pennington & Watson, Ashton	£9,750 0 0
S. Webster, Bootle	9,438 0 0
J. H. Wright, Leigh	9,390 0 0
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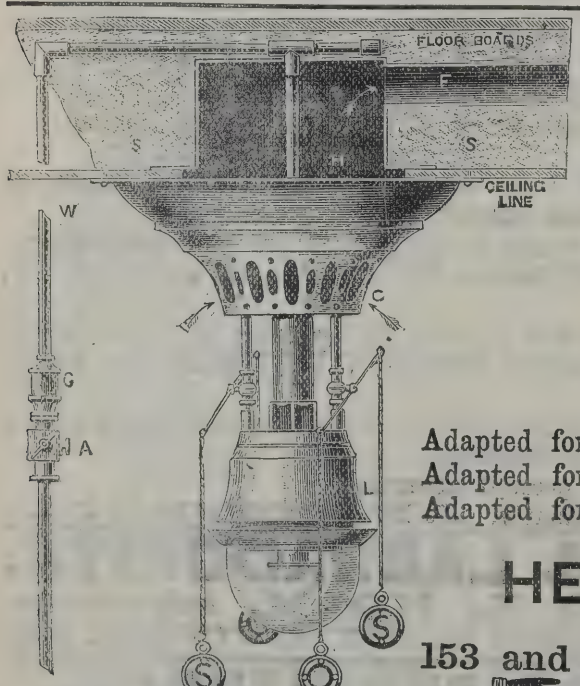
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BAKER & WISEMAN (*accepted*)	4,490	0	0

CHICAGO EXHIBITION NOTES.

THE Associated Press has applied to the Grounds and Buildings Committee for suitable space, either in the press quarters on the grounds or in a separate building, where its reports can be prepared and despatched during the Fair.

BETWEEN 340 and 350 men are employed in perfecting the landscape features of the exposition site. It is the intention to make the grounds exceedingly beautiful by walks, drives, lawns, terraces, fountains, shrubbery and flowers. Several hundred thousand dollars are to be expended for this purpose.

THE Palace of Music, it is now expected, will stand on the great island formed by the lagoons, and will be surrounded by a magnificent garden of flowers, 10 acres or more in extent. The structure will measure 150 by 250 feet, and cost approximately 100,000 dols.

THE magnitude of the building operations now going on at Jackson Park can be surmised from the fact that an average of from thirty-five to forty car-loads of construction material arrives daily. The buildings are rising with wonderful rapidity.

IVAN MALAKOFF, a St. Petersburg capitalist, wants to reproduce at the exposition a street scene from Nijni Novgorod. He agrees to spend 250,000 dols. upon the reproduction.

A COMPANY has applied for space to erect a building in the form of an iceberg, in which to make a Polar exhibit. A group of Esquimaux, with reindeer, furs and all the paraphernalia of inhabitants of the Polar regions, will be installed in the building if the concession is granted.

BRITISH COLUMBIA has decided to build a structure, which will be a novelty in architecture, composed of every variety of wood known to the British Columbia forests. The building will be built first in sections of contrasting woods neatly mortised together. The roof will be of native slate and a variety of cedar shingles, making in all a pleasing effect. It is intended to ship the building in sections, ready to be erected on its arrival. The display will be unique in every way, the government and cities of the province subscribing to the fund.

VAN HOUTEN & ZOON, the manufacturers of cocoa at Weesp, Holland, have set apart 100,000 dols. with which to make a splendid exhibit. They intend to erect a large building in the style of old Holland architecture of the fifteenth century, and to put in it, besides an exhibit in their own line of business, paintings, views, bric-à-brac, &c., illustrative of the Netherlands and the life and characteristics of the Dutch people.

A CONCESSION has been granted to M. Stepanni to erect a Moorish palace at the World's Fair. One of the many attractions which he proposes to exhibit in this palace is one million dollars in gold coin in one pile. It will be in a strong cage, and M. Stepanni says:—"Just under the gold will be constructed a fire and burglar-proof vault. To the doors of this vault will be connected electric wires. In the event of an attempt to rob the palace, my guards will press an electric button—the entire pile will fall into the vaults and the doors will spring shut."

A TOWER has at last been decided upon for the exhibition. The designs are by Mr. George S. Morison, and the contract has been let for 1,500,000 dols., subject to a heavy fine for delay in the completion of the work. The height is to be 1,000 feet, about the same as the Eiffel Tower, and there will be three platforms at various heights, the first being 250 feet in diameter and 200 feet from the ground. The foundations in this case will probably be carried down 40 feet.

NO confirmation has been received of rumours regarding the foundations of the immense exhibition buildings giving way. As to the substrata of Chicago, over the greater area there is a layer of good clay, 5 feet thick, about 10 feet below the surface level, and beyond that the material gets gradually softer until, at a depth of 40 feet, it is practically silt. But here the solid clay is again encountered. Several of the buildings in the city are of great height—up to nineteen storeys, or close

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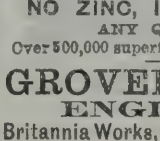
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upon 200 feet high—and it is found feasible to build the foundation on the clay; but the method adopted is to build up an underground structure with concrete and rails, which is weighty and yet occupies little room. It is often the case, too, that the foundation is weighted with rails equal in total weight to the buildings to be erected, so that the foundation settles before the structure is commenced.

AMERICAN NOTES.

THE twelfth annual meeting of the American Society of Mechanical Engineers will be held at the rooms of the Society, 12 West 31st Street, New York, commencing Monday evening, the 16th inst.

THE *Sanitary News*, Chicago, says:—No one likes to see a jerry plumber go to work. In the first place he will not do good work, and in the second he is doing the work he should have left for those who studied their trade and became efficient at it to do. There are men employing that kind of men, knowing full well that they do not do their work properly, and they do not want them to. The men who build houses to sell, put them up and speculate on them, may be found any time with a lot of these men under their employ.

A ST. LOUIS employer operating a zinc works was recently charged with importing workmen from England in violation of the Contract Labour Law. It was shown that an English workman had written to the manager of the zinc works asking for employment for himself and a companion. The manager replied stating that he had arranged for their transportation and directing the men where to apply in England. The men came as far as Philadelphia, where they were intercepted by the immigrant inspector and ordered back to England. The case was first tried before Judge Thayer, of the United States District Court, who decided that the correspondence did not constitute a contract within the meaning of the law, and that to prepay the transportation of an alien was not unlawful unless a regular contract was entered into under which the alien agreed to perform some kind of work, the terms of which both parties had agreed to. When an appeal was taken this decision was confirmed by the upper Court.

THE *American Manufacturer*, Pittsburgh, says:—Mr. S. L. Cohoon, of Battle Mountain, Nevada, has patented a device whereby waste steam can be utilised from a locomotive when stopping at a way station for the purpose of taking in wood, water or other purposes, the steam saved being used to pump water for the tanks or reservoirs about the station.

THE same journal says:—"The Middlesborough Town Company, at a recent meeting held in London, England, decided to push the development of Middlesborough, Ky., and raised 1,250,000 dols. for this purpose. These funds are said to be for the purpose of completing the South Boston Ironworks, waterworks, Davis charcoal furnace and other plants.

THE Union Pacific Railroad possesses a novelty in a compressed-air car-duster, for cleaning the inside of passenger-cars. In the sheds at Portland, Oregon, the passenger-car yard is laid with pipes in connection with the air-compressing plant. At intervals an ordinary garden-hose with a nozzle is attached to the pipes in a manner which will allow the nozzle to be drawn into a passenger-car through a window, where the air, at a pressure of 50 lbs., is used to blow the dust out of every possible lodging place, including the plush upholstery.

THE manufacturing establishments of Lima, O., have received notice from the Lima Gas Company that owing to the rapidly-decreasing supply the natural gas would be cut off this month.

IMITATIONS of wood are, the *N.-W. Lumberman* of Chicago says, all the go, especially in cheap furniture. It is like wearing cheap stones in lieu of diamonds. Those who cannot afford the costly woods are persuaded to buy rather inexpensive goods made to somewhat resemble the fancy woods by means of the counterfeiters' subtle arts. The high price of oak has caused a largely increased demand for elm to be used as an imitation. Imitations of mahogany, rosewood, walnut, &c., are time-honoured.

THE *Scientific American* says:—The members of the Technical Society of the Pacific Coast lately went to Palo Alto on the invitation of E. L. Ransome, who has nearly completed two large concrete buildings for the Leland Stanford, Jr., University. One of these is the girls' dormitory. The larger one is the museum building, and is the finest piece of building concrete work yet done in this vicinity. The structure is absolutely fireproof, and intended also to be earthquake-proof. It is built on the system patented by Mr. Ransome, so as to be a homogeneous structure as to walls and partitions, there being no joints. Twisted iron rods are used for additional strength where necessary. Even the interior arches and ceilings are of concrete. The stairways are made of concrete, and these will

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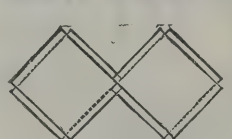
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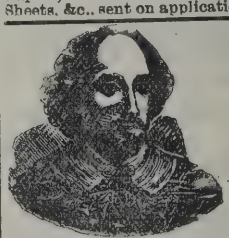
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be covered with marble steps. The hallways will be finished in marble over the concrete. There is no wood anywhere in the building, the window-frames, &c., being of metal. The exterior is furnished with a smooth coat of cement to resemble brownstone. The heavy columns of the entrances are, like the main structure, of concrete, and the statuary to surmount the building is moulded of the same material.

In connection with the Nicaraguan Canal, Mr. Warner Miller says :—"I have been spending some time in investigating the great canals of Europe. I went to see the great Manchester Canal. I then went to Holland, and saw the great Amsterdam Canal, which makes that city a seaport. The most important canal in all Europe is now being built by the German Government. It runs from Kiel, the great German naval station on the Baltic Sea, sixty-three miles across the Holstein peninsula, and ends at the mouth of the Elbe. It is to be a ship canal, and will save a distance in sea travel, when completed, of 700 miles. It will give direct communication between the North and Baltic Seas. The cost of this canal will be 50,000,000 dols., and the work on it is about half completed. There are about 10,000 men employed upon it. If the German Government can afford to spend 50,000,000 dols. to save 700 miles, the people of the United States can afford to build a canal across Nicaragua and save 10,000 miles between New York and San Francisco.

TRADE NOTES.

Mr. John Grundy's patent warm air ventilating grates are being erected at Belvoir Castle, the seat of His Grace the Duke of Rutland.

We have been requested to announce that the "Rosher system" of heating water has been adopted to warm the water in the canals of "Modern Venice" at Olympia. The volume of water is about 500,000 gallons, and its area nearly 1½ acres. This system of heating has been adopted by the Rainbow Engineering Company, of Victoria Street, Westminster, S.W., and has been extensively used by them for various swimming-baths throughout the country.

The extension to the Devon County Asylum, Exminster, is being warmed and ventilated throughout by means of Shorland's patent Manchester grates, which have proved satisfactory in the old building, the same being supplied by Mr. E. H. Shorland, of Manchester.

The new gasholder which has been erected at Johnstone, N.B., has been formally opened. The burgh officials consulted Mr. James M'Gilchrist, gas manager, Dumbarton, and on his advice the erection of a gasholder to augment the supply by 125,000 cubic feet was resolved upon. The Barrowfield Iron Company erected the gasometer on the telescopic principle, in order that, if necessary, it may be doubled for a small expenditure. Messrs. Black & Eadie, Paisley, contractors, constructed the tank, which is of brick and puddle. Mr. M'Bride, Paisley, was clerk of works.

The ventilation of the new higher grade school, Cardiff, is being carried out by Messrs. Baird, Thompson & Co., ventilating engineers, London and Glasgow, their latest improved patent ventilators being adopted throughout the whole building. The vitiated or foul air is extracted by means of their improved "Æolus" invisible automatic exhaust-roof ventilators. This concealed roof-ventilator provides for the extraction of vitiated air from churches, schools and other buildings, without disfiguring the edifice by the erection of excrescences on the roof. The introduction of pure, fresh air is provided by means of their latest improved air-inlet panel-ventilator.

At the monthly meeting of the Wallasey Local Board it was reported that Mr. Peter Smith had withdrawn his tender for widening the existing promenade to the north of Egremont Ferry for 600*l.* 19*s.* The tender of Messrs. W. H. Bleakley & Co., the next lowest, was therefore accepted.

Alterations have been made to the public hall, Brampton, the whole of the interior of which has been remodelled, so as to give increased accommodation, and the most careful attention has been paid to the ventilation, which has been carried out on the recommendation of the "Climax" Ventilating Company, 15 Great George Street, Westminster, S.W.

The well-known business of Mr. James Hill, Queen Victoria Street, has just attained its majority, and the event was celebrated by a dinner at the Holborn Restaurant on Monday, November 9th. Mr. Hill occupied the chair, and there was a large gathering of employés and friends. A very pleasant evening was spent, the usual toasts being interspersed with songs, musical sketches, &c. The principal toast was "Success to the Firm," and this was suitably responded to by Mr. Hill and his two junior partners, Mr. How and Mr. King.

At Nuneaton an inquiry has been held by Mr. Taylor, Local Government Board inspector, into an application by the Local Board to borrow 5,700*l.* for various improvements. 2,600*l.* of

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this sum is required for a compound condensing-engine, capable of raising 60,000 gallons of sewage per hour, with an engine-house, a well with a sewer from the bottom to the existing pump well, and a foreman's cottage; 1,500*l.* was for the extension of Manor Court Road; and 1,600*l.* for the purchase of land for the erection of a fire-engine station, with suitable offices, houses for the caretaker and the engine and the road foreman, and shedding for carts and stores.

BUILDING AND BUILDERS.

NEW Branch Stores for the Queensbury Industrial Society have just been opened at Thornton, Bradford. They consist of stores for grocery, drapery and flour, with warehousing and agent's house attached, and have been erected from designs prepared by Mr. Herbert Hodgson, A.R.I.B.A., of Bradford, by local contractors, at a cost of about 1,000*l.*

THE tender of Mr. Colin Macandrew, builder, for the extension of the Edinburgh Post Office has been accepted by the Commissioners of Her Majesty's Board of Works.

THE work of excavating for the proposed lift from the Lower to the Higher Town at Bridgnorth has been begun by Mr. G. Law, contractor, Kidderminster.

THE Dundee Harbour Trustees, in considering the new Bill which they intend to promote in the ensuing session of Parliament, agreed to ask for power to construct a new jetty to promote the fishing trade of the port, and to extend and improve the accommodation connected with the foreign cattle trade.

AT Cardiff an inquiry was held by Mr. Joseph Smith. The Corporation apply for leave to borrow 25,000*l.* for providing an infectious diseases hospital, 21,450*l.* for the extension of the Town Hall and Municipal Buildings, 3,170*l.* for the formation of a new street, and 2,500*l.* for works of sewerage.

THE Blackpool Town Council have decided to promote an Improvement Bill in Parliament to obtain powers to widen the promenade about twenty yards along its entire length; also to purchase land and buildings to erect a new town hall thereon; to reconstruct the lower walk, which has been latterly washed away, and to improve Claremont Park generally.

A GREAT Lancashire county bazaar has been opened at the Public Hall, Preston, in aid of the fund for the erection of a Poor Law certified Roman Catholic school for Lancashire. Land has been purchased outside Preston at a cost of 4,500*l.* A second school is being established outside Liverpool, and both institutions involve a heavy cost.

VARIETIES.

THE Rugeley Local Board have appointed Mr. W. H. Radford, C.E., of Nottingham, as their engineer to prepare plans for, and to carry out, a scheme for the water supply of the district. It is proposed to bore into the Bunter sandstone on the hills above the town, and store the water in a covered reservoir, from which it will be supplied by gravitation. No pumping will be required.

THE sanction of the Local Government Board has just been obtained to a loan for carrying out the sewage scheme, Hucknall Torkard. The system adopted is that known as the "International process," which has been applied with great success in various towns throughout the country. In addition to the precipitation tanks and filter-beds, 8 acres of land have been obtained on lease from the Duke of Portland, over which, if found necessary, the sewage may be conducted. The purified effluent will find its way into the river Leen. The Local Board will obtain tenders for the carrying out of the works forthwith, the engineer being Mr. Herbert Walker, Assoc.M.Inst.C.E., of Newcastle Chambers, Nottingham.

THE *Indian Engineer* says Mr. Cousins, of 14 Bridge Street, Westminster, is the expert who is to report on the sanitation of Madras during the ensuing cold weather. He is to be paid 3,500*l.* for his six weeks' work.

THE Pier and Harbour Commissioners, Stornoway, propose to carry out an extensive scheme for the harbour improvement.

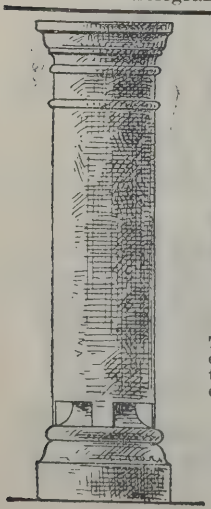
PLANS have been prepared for the construction of a harbour of refuge at Craster, N.B., by Mr. Sanderson, engineer.

IT is stated that Messrs. Scott & Co., shipowners, Greenock, have been compelled to refuse to contract for a line of battleship for which they had been asked to offer, because of the James Watt Dock, the largest in Greenock, being six inches narrower than the required size of the ship.

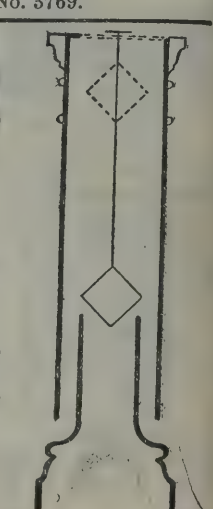
IN consequence of the success of the Exhibition of Antique Carpets held in Vienna some months ago, the Austrian Government have decided to publish a permanent record of the collection, and for this purpose 150 typical examples have been selected. Monographs will be contributed by the leading European experts, and Mr. C. Purdon Clarke, C.I.E., keeper of

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the South Kensington Art Collections, has been invited to write the general summary of this important work. Mr. Clarke, who has enjoyed the advantage of having studied the subject at the places where these gems of textile art were anciently produced—in Spain, Turkey, Syria, Persia and India—will also edit and translate the English edition, the plates of which are to be printed on white satin.

THE Improvement Committee of the Oldbury Local Board report that they have considered the schemes and plans submitted by three engineers for dealing with the sewage at the farm, and decided to recommend the Board to accept the plans and schemes marked "Forward"; that the plans marked "A 1, A 2 and A 3" be given the second prize, and those marked "Practical" the third prize.

THE Worcestershire City Council have authorised the committee to publish advertisements inviting persons or companies for the construction of electric-lighting works to submit plans, detailed descriptions and estimates of the cost for constructing the works they think necessary for enabling the Council to supply electricity equivalent to 12,000 ten-candle-power lamps, to be hung in a district extending northwards as far as McNaught & Co.'s Works, eastwards as far as Shrub Hill Station, southwards as far as the canal, and westwards to the Severn.

AN inquiry has been held by the Local Government Board of Maidstone relative to applications made for sanction to borrow 6,700*l.* for the purchase of the Lock-meadow land and 2,554*l.* for works of improvement.

IT is proposed to construct a bridge near Hayling Island Ferry, Portsea, at an estimated cost of 20,000*l.*

A FUND is being raised for providing fittings for the chancel of Denstone College Chapel, a work which is being proceeded with in sections, the latest completed portion being the choir-stalls of carved oak.

THE death is announced at Ealing of Mr. Thornhill Harrison, so well known as inspector under the Local Government Board. Mr. Harrison was born at Thornhill, Durham, in 1815. Educated at Edinburgh University, he was afterwards articled to his brother, Mr. T. E. Harrison, for many years associated with the North-Eastern Railway as chief engineer. After serving his apprenticeship, Mr. Thornhill Harrison was engaged under Mr. Brunel in the construction of the Great Western and South Devon Railways. In 1865 he was appointed a member of the Royal Commission on the Pollution of Rivers, and retained that position for four or five years. Subsequently he was appointed one of the engineering inspectors under the Local Government Board.

PROTECTION FOR IRON.

A NEW process by which iron or steel may be covered effectually and permanently with a coating of pure lead has lately been introduced and is now in operation at the works of Messrs. Joseph Westwood & Co., at Napier Yard, Millwall. This process is an American invention patented in the United Kingdom and on the Continent. The three patents are owned by a syndicate, under whose auspices the experiments have been made. They do not propose to work the patents themselves, but to grant licenses to the different galvanising firms and other cognate industries. This method of protecting iron from corrosion opens up a wide field of application on account of its reduced cost and greater durability as compared with ordinary galvanising, and by its being less readily affected by acids. During the past six months numerous mechanical tests have been made to ascertain the effect of this process on the tensile strength of the iron, with the result that while iron galvanised is deteriorated and loses some part of its original strength, the iron coated by this method retains its tenacity and preserves at the same time its ductility, and so closely are the two metals allied that the lead is not removed from the elongated and contracted fibres, even at the point of fracture. Netting and wire-gauze of fine mesh can be coated satisfactorily, and sheets, bars, wire, &c., can be treated equally well either before or after they have been subjected to the ordinary workshop manipulations. For bolts, rivets, wood screws, &c., the process is peculiarly adapted, as the threads do not become filled up by immersion in the molten lead, and in consequence no cleaning out or retapping is necessary.

THE CARDIFF CUP.

THE cup presented by the Marquis of Bute to the Corporation of Cardiff, as a memorial of his lordship's mayoralty, was designed by Mr. Birnie Rhind, the sculptor, who adopted the Italian Renaissance as the most appropriate style for a vessel which is 30 inches in height. On a circular base, which is richly jewelled and engraved, are seated round the stem of the

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cup three river gods, representing the three rivers of Wales, each of the figures bearing vessels from which water is running, indicative of their symbolical character, the running water being symbolised in rock crystal. Round the stem alone is twisted and entwined the Welsh dragon, the body being elaborately studded with carbuncles, the eyes of emeralds and the claws of diamonds. Above are two highly-decorative handles, the upper part of the handle being a female winged figure, and the lower part dividing into scrolls, which attach themselves to the bowl of the cup. On each side of the cup between the handles are shields—that on one side bearing the Marquis of Bute's arms, the quarterings being shown in coloured enamel, and that on the other side bearing the arms of Cardiff, surmounted by the mural or civic crown. Between these shields, behind the handles, are decorative masks, the remaining spaces being enriched by *repoussé* ornament. On the centre of the lid stands a female figure symbolical of Cardiff. Her left hand rests on a rudder, to denote the shipping industry of the city; while her right foot, slightly advanced, rests upon a piece of coal, another important branch of Cardiff's prosperity. In her right hand she bears the olive branch of peace. The mural crown on her head is composed of diamonds. At her feet reclines a water nymph, representing the Severn; while around the lid are water lilies and leaves, indicating the river flowing past Cardiff, each leaf having a diamond sparkling in the centre. The figures are enamelled a natural flesh colour where not hidden by the drapery. The work was carried out by Messrs. Crichton & Co., of Edinburgh. The cup cost about 2,000*l*.

REGISTRATION OF PLUMBERS.

THE Mayor of Limerick presided at a special meeting, held in the offices of the Limerick branch of the National Registration of Plumbers, to consider a Bill drawn up by the Worshipful Company of Plumbers, London, to legalise the registration system. The Mayor was supported by the City High Sheriff, Dr. Barry, corporation medical officer of health, R. Fogerty, C.E., H. Sexton, J. Shiels, J. Palmer, &c. The hon. secretary to the local committee, Mr. P. J. Lynch, C.E., read the draft Bill to the meeting, and explained that in principle it aimed at giving legal sanction to the work which had been already done, and transferring to one General Council the powers and control already exercised by the various district councils and the Worshipful Company of Plumbers. Limerick was one of the cities in Ireland scheduled to elect representatives on the contemplated General Council.

After full discussion, Dr. Barry moved the following resolution:—"That this meeting of the committee for Limerick and district hereby approve of the principle of the Bill drawn up by the Worshipful Company of Plumbers, London, to define and legalise the system for the National Registration of Plumbers."

The resolution was supported by Mr. Fogerty and carried.

The High Sheriff being moved to the second chair, a cordial vote of thanks was passed to the Mayor for his kindness in presiding.

The Mayor, in reply, said that he was particularly happy in assisting a movement so closely connected with the public health.

AT the last meeting of the Belfast Master Plumbers' Association resolutions were unanimously passed approving of the action of the Worshipful Company of Plumbers, London, in drafting a Bill for legalising the national system for the registration of plumbers, and recommending the inclusion of a representative of the Association on the General Council contemplated by the draft Bill. At the same meeting a resolution was unanimously passed urging that the powers conferred on the Belfast City Council should be made use of to sustain and develop the Belfast Technical School, and recommending that "all encouragement on the part of masters be given to their apprentices to secure their attendance at the plumbing classes in the Technical School."

THE INSTITUTION OF CIVIL ENGINEERS.

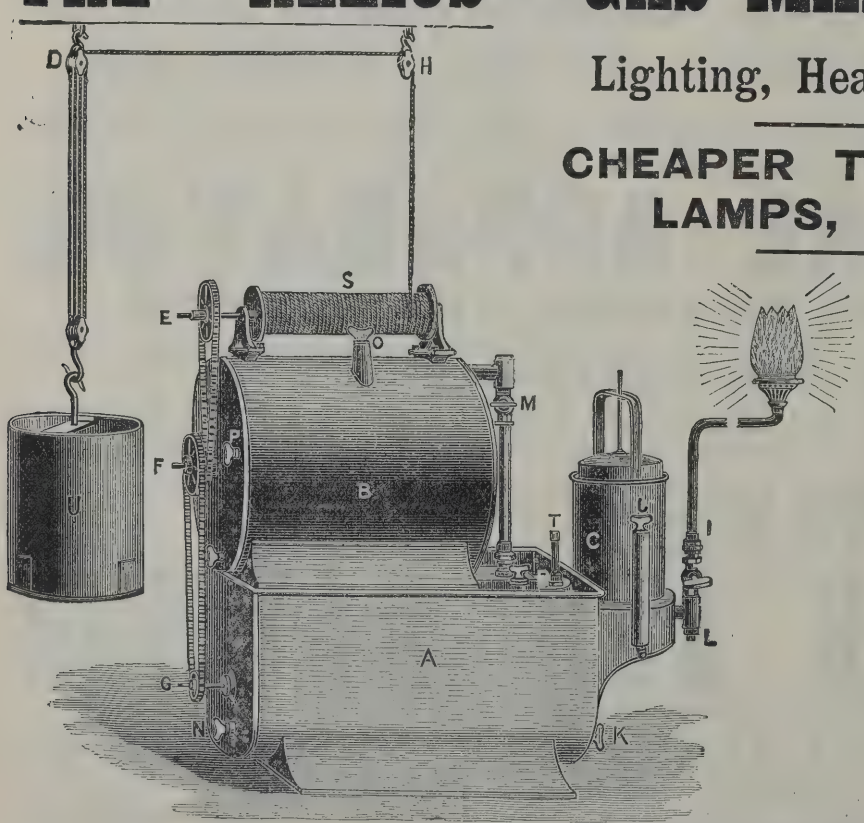
THE opening meeting of the 74th session of this institution was held on the 10th inst., and was very fully attended.

The following is a detailed list of the awards made for original communications submitted during the past session and discussed at the ordinary meetings:—Telford medals and Telford premiums to Llewelyn Birchall Atkinson and Claude William Atkinson, Assoc.MM.Inst.C.E., for their joint paper on "Electric Mining Machinery." A Telford medal and a Telford premium to Rookes Evelyn Bell Crompton, M.Inst.C.E., for his paper on "The Cost of the Generation and Distribution of Electrical Energy." A Telford premium to Frederick Ewart Robertson, M.Inst.C.E., for his account of "The Lansdown

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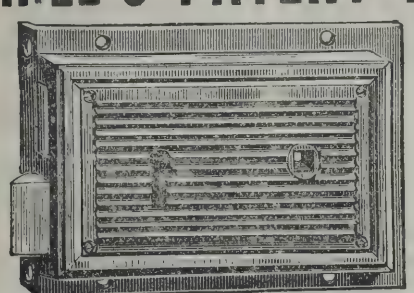
Bridge over the Indus at Sukkur"; to Edward Waller Stoney, M.E., M.Inst.C.E., for his description of "The New Chittravati Bridge, Madras Railway"; to Professor John Milne, F.R.S., and John M'Donald, for their joint paper "On the Vibratory Movements of Locomotives, and on Timing Trains and Testing Railway Tracks"; to William Langdon for his paper on "Railway Train Lighting"; to William Thomas Henney Carrington, M.Inst.C.E., for his paper on "The Reception and Storage of Refined Petroleum in Bulk."

For papers printed in the proceedings without being discussed:—A Telford premium to Bryan Donkin, jun., M.Inst.C.E., for his paper on "Thermometers in and about the Cylinder-walls of Steam-engines, with some Experiments on the Temperature of the Metal under Different Conditions"; to John James Webster, M.Inst.C.E., for his paper on "Fireproof Construction"; to Charles Preller Sheibner, Ph.D., Assoc. M.Inst.C.E., for his account of the "Carrara Marble District Railway."

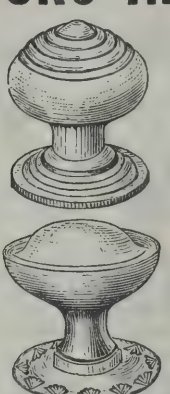
For papers read at the supplemental meetings of students:—Miller prizes to Edmund Lewin Hill, Stud.Inst.C.E., for his paper on "The Counterbalancing of Locomotive Engines"; to John Henry Barker, Stud.Inst.C.E., for his paper on "The Design of Locomotive Cylinders"; to William Archer Porter Tait, B.Sc., Stud.Inst.C.E., for his account of "The Lanarkshire and Ayrshire Railways"; to Bertram Chatterton, Stud.Inst.C.E., for his paper on "Disintegrators"; to John Walter Brown, Stud.Inst.C.E., for his account of the "Malta Dockyard Caisson, No. 4"; to Auriol Sealy-Allin, Stud.Inst.C.E., for his description of "A New Type of Water-motor"; to William Herbert Wheeler, B.A., Stud.Inst.C.E., for his paper on "The Cleaning and Deepening of Rivers and Canals by means of the Transporting Power of Water."

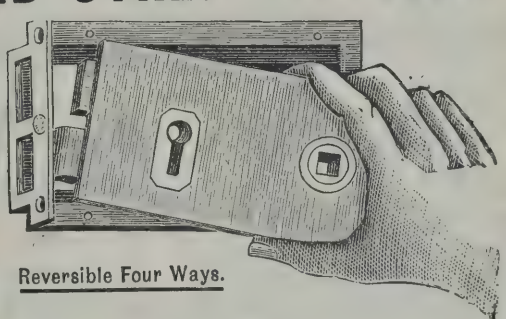
Mr. George Berkley, the president, occupied the chair for the first time since his election, and delivered an inaugural address. He stated that his object would be to trace the advance of engineering work in relation to social progress. First of all he dealt with the efforts of men in utilising the resources of nature during prehistoric times, indicating what had been accomplished in this respect by the Egyptians, the Greeks and the Romans. The chief characteristics of more recent times as affecting engineering work were the development of commerce and the demand for more perfect sanitary conditions. Confining his remarks to the metropolis, Mr. Berkley pointed out that the death-rate had decreased from a mean of 24·8 per 1,000 during the decade ending 1850 to 22·5 in that ending in 1880, and to 21·4 in the year 1882, while during the past eight years it had averaged 19·52 per 1,000. This continuous reduction might fairly be attributed in a great measure to engineering work. The decrease in the death-rate might probably be much larger if the repair or the replacement of defective drainage and imperfect ventilation in old houses could be insured. A copious and constant supply of pure water at high pressure, being of primary importance for health and comfort, should receive early attention on behalf of the inhabitants of the metropolis. Attention was directed to the invention of type-printing and its influence on civilisation, to the successive developments of the steam-engine and to investigations for the more accurate and minute subdivision of time. To the marine chronometer of John Harrison might without doubt be attributed in some degree better navigation, by which the increase in the number of ships engaged in commerce in the eighteenth and nineteenth centuries had been rendered possible. The progress in shipbuilding was then referred to, and the successive steps by which higher speed and greater economy in the propelling machinery were introduced. These improvements had facilitated the building and navigation of the large steamers which now crossed the Atlantic in less than 6 days instead of about 14½ days as in 1840. The great increase in the number and in the size of ships had directed attention to the construction of suitable harbours and of lighthouses, of which several illustrations were given. Inland navigation of canals, including ship canals, next received attention, and in regard to the Suez Canal, opened in 1869, it was stated that in 1888 the average time occupied in passing through the canal by vessels not using electric light was nearly 38 hours, while vessels which used the electric light passed through in 22½ hours, thus saving 40 per cent. of time, and increasing the carrying capacity of the canal. In 1890, 3,389 vessels, of which 2,522 were English, passed through the canal, and 2,832 at night with the aid of electric light. The average length of the passage was 24 hours, or without stoppages 18 hours, representing a saving of more than 2½ hours since 1889. In this section of the address reference was made to the Manchester Ship Canal, although not yet finished, and details were given of some of the more important works. Canada and the United States had presented great opportunities for the engineer in the deepening of rivers and in the formation of canals, of which particulars were furnished. The idea of establishing a waterway across the American isthmus was then referred to, and attention was directed to the route proposed to be taken by the Nicaragua

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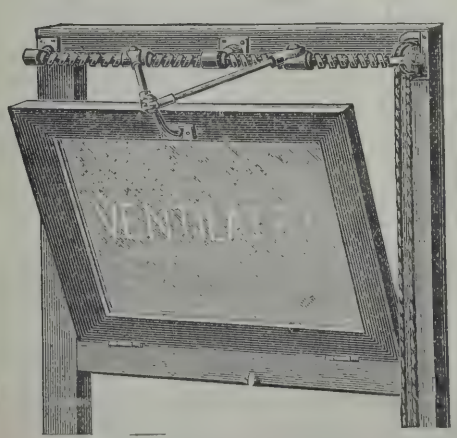
Reversible Four Ways.

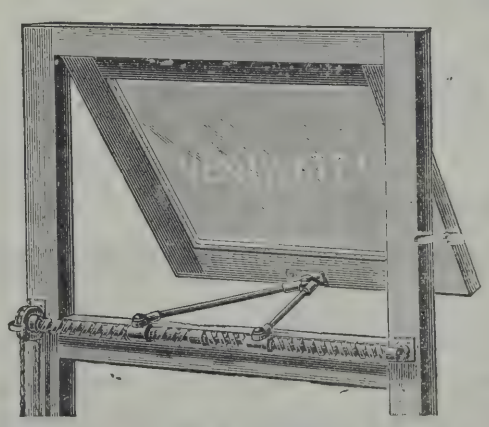
Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod on right or left side.

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Canal, between Greytown on the Atlantic and Brito on the Pacific. The Ship Railway now being constructed to connect the Bay of Fundy with the Gulf of St. Lawrence was next dwelt upon. The railways of India conformed generally to the type of British railways, except perhaps in regard to the sleepers, for, although timber was abundant in India, it was not durable for the purpose indicated. Accordingly for many years cast-iron and steel sleepers had been adopted. On the Great Indian Peninsular Railway there were 2,600,000 pairs of cast-iron sleepers, as compared with 848,000 wooden sleepers. The average life of iron sleepers during 18 years seemed to prove that they would last 60 years, or six times longer than wooden sleepers, and that their use (although their first cost was greater) would prove economical. From the administration report on the railways of India for 1890-91, it appeared that 10,900 miles on the standard gauge of 5 feet 6 inches were either made or had been sanctioned, and that there were nearly 7,500 miles of mètre gauge. The most noticeable feature on railways in all countries had been the necessity for greatly increasing the strength of bridges and other works of art, and especially the permanent way, in consequence of the greater weight of engines and rolling stock. The question of gauge elicited the opinion that this should be well considered for every country in the first instance, as only for the most important reasons should a second gauge be adopted, and then only as feeders to the main lines. Thirty years ago it had been thought that the works on Indian railways were too substantial, and that the system previously in vogue in the United States should have been followed. He, however, was of opinion that it was fortunate this suggestion had not been acted upon, for soon afterwards the temporary character of the American works had become apparent, and a more substantial system of construction was resorted to. Some of the bridges constructed in the United States then came under review, the most important, both on account of magnitude and of typical character, being the St. Louis bridge over the Mississippi, the Brooklyn suspension, Washington over the Harlem river at New York, and the cantilever railway structure at Niagara. Here reference was made to the proposed utilisation of the water power from the Niagara Falls, for which a company had been formed in 1886 and a charter had been secured. The progress in telegraphy, telephony, electric lighting and the electric transmission of power was next dealt with, and the experience acquired by the authorities of the General Post Office was cited. It appeared that by the multiplex system of working six messages could be sent along a single wire instantaneously in each direction. The length of conducting wires laid in England for public telegraphic purposes was 174,633 miles, and the number of instruments was 13,740. In London 5¾ million messages, and in Great Britain 66½ million messages were received in 1890. Speech had been maintained with perfect clearness by telephone between London and Paris, a distance of 311 miles. The production of electromotive force was then noticed, especially the transformation of electric into mechanical energy, by making the dynamo serve as a power-receiving as well as a power-giving machine. Since 1883 the usefulness of the dynamo and motor had been further developed, chiefly by the means taken to reduce losses of energy by friction and by eddy-currents and magnetic leakage, as well as to avoid sparking. For the illumination of streets in this country electric light might hereafter become more general. The length of electric rail or tramways worked in England only extended to 26½ miles, its most perfect application being, perhaps, that of the City and South London Railway. Another use of electricity was the connection of many parts of the world by submarine cables, of which 48,600 miles had been laid. Electricity had been successfully applied to lighting, haulage, drilling and coal-cutting in mines, both in England and America, and for welding metals—a process which was steadily on the increase.

A LINLITHGOW BUILDING DISPUTE.

AN action has been commenced in the Court of Session, Edinburgh, against the Town Council of Linlithgow by Mr. Richard Philip, a local builder. The circumstances are as follows. Mr. Philip was contractor for the erection of the new Town Hall. While the work was being proceeded with in 1888 part of the building subsided, and buttresses were erected with a view to strengthening the injured parts. A dispute has arisen as to who was responsible for the subsidence, and in consequence the Council refuse to pay the contractor the balance of his account for extra work. The contractor maintains that he worked according to the instructions of the architect and master of works, and that the subsidence was not caused by any fault on his part, but by the treacherous foundation on which the hall was built. The services of skilled men were called in, and reports submitted to the Council, but notwithstanding this, no satisfactory solution of the matter was arrived at. The Council maintain that the contractor is bound by a formal agreement,



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entered into with the Council, to submit the matter to arbitration for final settlement. The dispute has gone on for a considerable time, and the contractor has now raised an action in the Court of Session to recover his money, the sum sued for being 283*l.* 17*s.* 10*d.* By a majority of eight to five the Council resolved not to defend the action, and a committee was appointed to meet Mr. Philip to arrange terms of settlement. Against this resolution the minority protested, and the Provost intimated that he would take means to prevent the money being paid over until the dispute had been referred to arbitration.

PROTECTION OF RESIDENCES.*

THE air we breathe, and which for this reason constitutes part of our body, is never pure. In the midst of cities it is full of dust, smoke and a score of minor impurities. In the open country it generally becomes purer with the distance from densely-populated spots, and the purest air is found on the summit of mountains and in remote woodlands. Pure air, this loose compound of oxygen and hydrogen, is constantly impregnated not merely with extraneous substances above referred to, but also with traces of all elements and natural compounds in proportion to their relative volatility. Accordingly, we find in it carbonic acid in measurable quantities, ammonia, nitrous acid, and even some metallic acids in traces. Arsenious acids, for instance, are always present in the vicinity of arsenious products, so that miners and workmen especially are injured by inhaling the air thus contaminated. A similar fate, as we know, is in store for workmen in the quicksilver mines and in the manufactories of white lead. Various odours will penetrate the air in immeasurably small quantities. It is altogether impossible to measure by weight or otherwise the substances which signify their presence by odours, though ever so penetrating, such as, for instance, assafœtida or musk. With every draught of air, therefore, we not only take in all substances therein suspended which are perceptible to our senses or by our instruments, but also take in immeasurably small quantities of all other elements and compounds in existence. Hence the mysterious compound of our blood so wonderfully complex. But the air is not merely a composite of all inorganic substances. The dust therein suspended is full of organic life—life struggling for existence, were it at the expense of the life of higher beings.

The whole philosophy of medical science has of late been subverted through the gradual discovery of the extensive species of minute beings called bacteria, the lowest order of beings known to exist. They were at once believed to be the product of a *generatio æquivoca*, of spontaneous generation, until it was made evident by Pasteur that they are generated *ex ovo*, from the egg. Philosophers have, however, then subsequently, not abandoned faith in spontaneous generation from the original elements upwards, but have put the bacteria up as a rather composite race of beings, made up from many millions of molecules, and established a belief in a class of organic beings as progenitors, as it were, of the bacteria, which beings are to be many times simpler in their compostion and smaller than are the latter, and so minute in size that they will for ever be hidden from human sight.

The microscope, so wonderfully improved in these days, has been instrumental in the discovery of many species of the bacteria family, to which special names were given, as though they were positively distinct from each other. The latest science, however, seems to discover that the family has but really one or a limited number of species, the members of which are changing from one form into another, an opinion which was early propagated by Professor Naegeli at Munich, but contradicted by other philosophers.

All diseases and ailments of the human system are, according to an overwhelmingly large number of medical philosophers, owing to encroachments thereon by bacteria, as destroyers of blood and tissues. Quite a number of these bacteria have been minutely measured. The modern microscope has given the diameter of a microbe, so called, at 1-20,000 of an inch, and its length at ten times that. Accordingly, a cubic inch of space would contain 800,000 millions of them, while the size of the average blood-corpuscle, at 1-3,500 inch in diameter by twice this for its length, would yield 20,000 millions of them, and that of a grain of san-dust, of an average diameter of 1-1,000 of an inch, 1,000 millions thereof to the cubic inch. Taking this size of the san-dust as a unit, the size of a blood-corpuscle is to be expressed by 1-20, and that of our microbe at 1-800 of such unit; and the microbe assumed is by no means one of the smallest. It is merely one of those which have been measured, while hundreds of them, perhaps ten to fifty times inferior in size, have not been accurately noticed under the spectra of a microscope. No scientist, as yet, has distinctly seen the

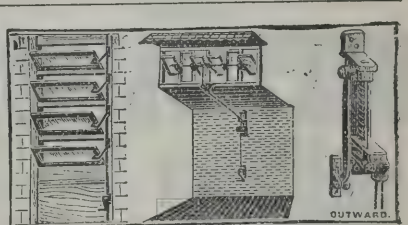
* A paper read by Mr. Frederick Baumann before the Convention of the American Institute of Architects at Boston.



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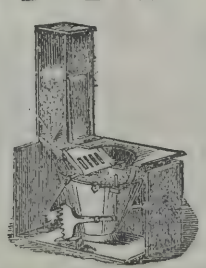
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microbe which is considered to be the cause of the scourge which made its first appearance in 1498 with the French soldiers in Italy. Its original absolute incurability, however, was mitigated in the course of time. Men became gradually inoculated by inheritance with traces of the microbic poison, so as to be in a degree protected, and it is expected by scientists that in time the evil will entirely cease. Interesting it is that this evil has become a factor in the civilisation of new countries, inasmuch as it tends to eradicate the original inhabitants, who are not from progeniture inoculated, and not subject otherwise to civilisation. Added to this comes the inevitable whisky, so that two evils combined are found to be, in a sense, factors—very active factors—of civilisation as it proceeds in new countries.

The microbe, or what else it may be called, of the scourge of small-pox has lost its power over man through the timely inoculation of the cow-pox virus into the human blood. It has been made evident by Pasteur that this cow-pox virus is coincident with small-pox virus, merely many a thousandfold attenuated. Hence the consequent efforts of this scientist as to a protection of human blood in a similar manner against the encroachment of microbes which are the cause of a number of infectious diseases.

Some twenty-five years ago Professor Naegeli mentioned some very interesting and, as I believe, important experiments as to the life of the lowest orders of fungi, of which our bacteria are the lowest yet. He prepared a proper neutral nourishing fluid, and put therein the seeds of mould fungi, fermenting fungi and bacteria. The result was that the latter exclusively went on to multiply at the expense of the nourishing fluid, so that not a trace of the other two kinds of fungi could be found. He then added 1 per cent. of tartaric acid to a fresh dish of nourishing fluid. The result now was that the fermenting fungi had the field for themselves exclusively. A third experiment, with 5 per cent. of the acid added to the fluid, gave the field to the mould fungi. Singly each kind of fungi would grow in either kind of nourishing fluid, but in competition with each other the field was conquered by one kind exclusively.

Arguing from this fact, Naegeli justly asserts that the blood corpuscles, as principals within their nourishing fluid, ever prevent the growth therein of other fungi, which are constantly inhaled with the air, thus coming in direct contact with the blood of the lungs. The blood corpuscles ever do this so far as they are in sound condition. But, alas! they are often weak and often subject to debilitating effects, so that the foreign fungi get a chance to grow and multiply, so rapidly indeed—doubling their number within every few minutes—that within a few hours the blood's life, and therewith the life of the being, may be destroyed. Within the child there flows and grows the blood of its parents, and all the latter's ills and ailments that human flesh is heir of accompany the child. The German student expresses this in the jocular statement that every man "should be most careful in the selection of his parents."

A birthplace of bacteria is below the ground, nearest the level of ground-water. As the water recedes the fungi get dry and slowly rise with the ascending air-current to the surface and into the atmosphere, there to be by chance inhaled. Assuming a grain of fine sand to be 1-200 of an inch in diameter, the number of grains per cubic inch is eight millions; further, assuming the interstices between grains at one-fourth, we may safely count thirty-two millions of interstices as taking up the entire space of a cubic inch. A single interstice may thus contain thirty grains of san-dust = 600 blood corpuscles = 24,000 microbes. A single microbe, of medium size, may, therefore, very conveniently ascend within a body of even the finest sand, within the pores of rock, of brick, mortar and concrete. It finds no sort of impediment in any dry substance excepting dense clay, so far as it is not wholly dry. Such clay protects, as is substantiated by the following account of Dr. Pohl:—A country gentleman had on his estate seven one-storey houses inhabited by labourers. These houses were dilapidated and dirty. Their floors were a sort of concrete made of clay. The houses were doomed to be destroyed to make room for commodious tenements of a better class. At a time when cholera visited the place five of the houses had been renewed, with floors raised from the ground, which had been deprived of the layer of clay; two were in their previous condition. The disease laid up eighteen of the inmates of the new and improved, ostensibly far more sanitary houses, and none at all of the two rotten and dirty houses. The result could only be attributed to the fact that the clay floors had effectually prevented any preparatory disease-germs to rise within those houses.

I have at last arrived at my task proper. Bacteria are at all hours generated in the soil under our very homes, they rise, and are inhaled by us as the inmates. Among them there may at any time be some of the kind which cause disease, which might or might not grow at the expense of our blood, as circumstances beyond human control would govern. The upward current, which brings them to us, is augmented in winter, as we well know, by the reverse of temperatures. Where human

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well-being and life are considered worth anything, there the architect of the present day should, without fail, pay due attention to such construction of a residence-building as would fairly warrant a protection against all ascending air-currents ever present under its floors and in its walls. The task is neither difficult nor expensive, as we shall see, and no excuse can effectively be offered on this score.

Common materials most likely to be proof against penetration of microbes are asphaltum, glass and pitch-tar. The asphaltum to be had in form of pressed plates. All these materials can be most readily had and employed. Asphaltum or glass, in two layers, on proper mortar, to be put in all walls at the level of lowest floor. Asphaltum also to be put against exterior walls, terminating below lower water-table. Concrete, with level surface, established on the entire ground, to be covered with a coat of pitch-tar and tarred felting, which may be repeated once or twice, to be lastly covered with a proper layer of finish-concrete. Where wooden floors are required, the finish-concrete may contain the required sleepers. Where desired, a further protection can be had by spreading a sheet of lead under the furnace-stand prior to making the last concrete. Even the entire surface of basement may thus be advantageously covered, where expense is no objection.

These arrangements, carefully executed, are unquestionably calculated to produce the nearest positive impregnability of floor and walls of a house, though we must conceive it as next to impossible to give absolute evidence as to such effect. We must rest our assurances on the degree of impregnability on the substances employed and on the accurate manner of their employment.

The arrangement excludes the use of iron sewers, and requires all water-supply pipes to be suspended from the basement ceiling. Return-pipes of a steam-heater and cold-air ducts must likewise be thus suspended. Iron sewer-pipes are objectionable for several reasons. Iron is a bad material to be put under ground. It decays. The decay is augmented by the acids of the liquids within the pipes, and the flow is impeded by rust. Arrangements for cleansing are, therefore, provided at short intervals. Earthen sewers, on the other hand, if well made, are of the most enduring material within our mechanical province, and should not be rejected because they are generally so bunglingly applied by our mechanics. Good sewering requires the excavation of all trenches at one time, and a concave concrete foundation on a gradual and even pitch for all sewers. The sections should be laid in mortar of Portland cement, and connected by means of metallic rings, which will insure permanency. The receiving ends should be fully turned up, and have a socket in which is fitted an iron member receiving the soil of the waste-pipe, both being provided with a tight slip-joint. The joints within the socket to be tightened with a mixture of asphaltum and sulphur.

Provisions thus properly made, with due care and foresight, are unquestionably calculated to secure residence buildings in a desirable measure against the encroachment of those invisible beings which are the ever-present and most persistent enemies of the human race.

THE PARKER STREET LODGING-HOUSE.

AT the last meeting of the London County Council the Housing of the Working Classes Committee reported upon the tenders for the erection of the Parker Street lodging-house. The amounts of the tenders ranged from 13,988*l.* to 18,500*l.* Although the architects of the building, Messrs. Gibson & Russell, had previously warned the Council by letter that, in consequence of the rise in the rate of wages and in the price of materials, their original estimate of the cost of the building would in all probability be exceeded, the committee were not prepared for so great a difference as that disclosed by the tenders. When the committee first reported to the Council in March of last year recommending the erection on the Parker Street site of a model lodging-house, to accommodate 320 persons, the cost of the building, including furnishing, was estimated at 11,000*l.*, and the net return, to yield 4 per cent. upon the outlay and value of the site, was based upon a charge of 4*d.* a bed per night. This estimate was made upon a design prepared by the architect of the Council. Subsequently it was decided to invite designs by public competition, with the result that in the month of May last the design of Messrs. Gibson Russell was selected and adopted. This design had to be remodelled, owing partly to the decision arrived at to open out the Shelton Street area by the acquisition of Messrs. Corben's and Messrs. Hunter & Hyland's premises (which allowed of an increased frontage for the lodging-house), and partly to the necessity of complying with the building regulations of the Council and keeping down the height of the building itself so as not to exceed the width of the street. These circumstances involved the construction of a building of three blocks instead of two, and an additional staircase, meaning an extra expense of about 1,000*l.* The lowest estimate was 13,988*l.*, which was

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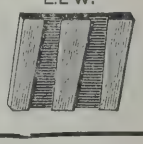
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4,000*l.* more than the original estimate, or 3,000*l.* more if the above circumstances were taken into account. Messrs. Gibson & Russell, the appointed architects, attributed this difference in part to the advance in the cost of building materials and machinery and the rise in wages (which they put together as representing 10 per cent. of the total cost), and in part to items added to the specification at the request of the committee, such as a separate building for laundry purposes, iron and cement divisions to cubicles instead of wood, stone facing to building and granolithic pavement in lieu of cement. The committee had considered whether, having regard to the amount of the tenders, it would be well to omit these items, or some of them, and so reduce the initial outlay, but they were strongly of opinion that as this was the first building of the kind, and one intended to serve as a model, it would be most undesirable to run any risk of not producing a wholly satisfactory result. At the same time they considered it necessary that the sum to be charged per bed should be one which should yield a return of 4 per cent. on the total outlay, and that, in view of the exceptional advantages proposed to be offered of separate cubicles in place of the customary dormitory plan, a somewhat higher charge should be made per bed than 4*d.* a night. The committee were of opinion that, as Messrs. Holloway were known to be builders of experience, it was desirable that their tender should be accepted. If the Council accepted this view, the corrected estimate of the cost of the building would be as follows:—Contract price, 14,300*l.*; cost of furnishing, 750*l.*; architects' commission, clerk of works and quantity surveyor (not considered in original estimate), 1,100*l.*—a total of 16,150*l.* If a charge of 5*d.* per bed per night were made, after due allowance for wages of persons to be employed, for empties and for repairs, a return might be expected of over 4 per cent. on the above sum and on the value of the site, which for that purpose they calculated in the form of ground-rent at 3*d.* a foot, which was probably more than the land would fetch in the market if sold for artisans' dwellings. The definite recommendation the committee now made was:—That, subject to the usual estimate being submitted by the finance committee in accordance with the statute, the Council do accept the tender of Messrs. Holloway Brothers for the erection of the Parker Street lodging-house.

Mr. Acworth moved and Mr. Debenham seconded an amendment referring the report back to the committee for further information in consequence of the large addition to the original estimate.

After some discussion the amendment was negatived.

Mr. Hutton moved a further amendment, "That the committee be instructed to reduce the estimated cost of the Parker Street lodging-house to conform with the original estimate of 10,250*l.*"

Mr. Cobbett seconded.

Earl Compton, M.P., the chairman of the committee, said that personally he was in favour of restricting the price to 4*d.* a bed per night, and he hoped the Council might agree to take a somewhat lower rate of interest than 4 per cent. in order to enable this to be done.

The Council divided, and there voted for the amendment, 25; against, 54; majority against, 29. The recommendation of the committee was agreed to.

BUILDERS' BENEVOLENT INSTITUTION.

THE forty-fourth anniversary dinner in aid of the funds of this institution was held on Thursday, the 5th inst., at Carpenters' Hall, London Wall. Mr. B. E. Nightingale, the president of the institution, occupied the chair, and was supported by Mr. George Plucknett, J.P. (treasurer of the institution), Mr. J. W. Hobbs, Mr. Basil Peto, Mr. B. J. Jacob (warden of the Carpenters' Company), Mr. Howard Clarke, Mr. H. T. Norcroft, Mr. W. Higgs, Mr. C. Bussell, Mr. T. Stirling and other friends of the institution, the company numbering over 150.

The Chairman gave the toasts of "Her Majesty the Queen" and "The Prince and Princess of Wales and the rest of the Royal Family." The Chairman also gave "The Army, Navy and Auxiliary Forces," Major Button responding for the Army and Navy, and Lieutenant Clarke for the Auxiliary Forces.

The Chairman, in proposing the toast of the evening, "Success to the Builders' Benevolent Institution," said that this charity, which had been founded for the purpose of helping those who had been less fortunate than the gentlemen he saw around him, had been in existence some forty-four years. During that time more than 250 persons had been assisted. At present there were 54 pensioners, and several people were waiting the opportunity of receiving their benevolence. The work of assisting their less fortunate brethren was one which should commend itself to the liberality and generous sympathy of all those connected with the trade. They must all have known many men who had "gone under" through no fault of their own, but by stress of circumstances over which they had no control. It was

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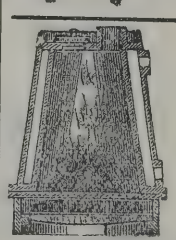
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sufficient to know that men holding at one time good positions had left their widows and families unprovided for, and those who subscribed to this charity were doing their best to help such unfortunate persons. This institution depended entirely on the liberality of the members of the building and allied trades, and was therefore unlike many charities which could appeal to all classes of the community. The Chairman concluded his appeal to the sympathy of his hearers by coupling the toast with the name of Mr. George Plucknett, J.P., the treasurer.

The toast having been duly honoured, Mr. Plucknett replied on behalf of the institution, and said that this year the lamentable strike would influence the receipts of the charity. At the same time, he had such confidence in the builders of London that he did not believe they would allow the institution to dwindle for want of funds. It had now been in existence for many years, and had always managed to meet its requirements. The committee would like to see the income increased, as they were only able to provide relief at present for one out of the four applicants, and thus these old people, who would not live long enough to benefit by the institution, had to stand over for some time.

The Chairman also gave "The Worshipful Company of Carpenters," referring to their kindness in giving the use of their fine hall, and subscribing largely to the funds of the charity.

Mr. B. J. Jacob, warden of the Carpenters' Company, replied, and added that his only regret at these gatherings was that the subscriptions had not amounted to four figures.

Mr. J. W. Hobbs proposed "The Chairman," congratulating Mr. Nightingale on the manner in which he had fulfilled his duties. The trade had been passing through a most serious struggle, which had resulted in heavy loss both to employer and employed, and it required a brave man, with such a fight looming in the distance, to undertake the presidential duties.

The toast was received with acclamation, and the Chairman made a suitable reply.

Mr. Basil Peto gave "The Architects and Surveyors." Although actuated with the best feelings in the world, the builder and the architect, towards the end of a job, sometimes got into a little difference of opinion, and had then to call in the help of the surveyor, who acted as a great "make peace." They could not forget, too, the most unfortunate matters connected with the building trade now under the arbitrament of the President of the Royal Institute of British Architects. His only regret was that more architects were not present at these dinners.

Mr. Howard Clarke replied on behalf of the architects, who, he said, were not without their troubles. The architects of the present day were doing their best to improve London and the provinces, and he need only instance such buildings as the new Metropolitan Assurance Office in Moorgate Street, the new building of the Chartered Accountants, and such buildings as were to be seen on the Thames Embankment, which were worthy of all time.

Mr. Norcroft replied in a humorous speech on behalf of the surveyors.

The remaining toast, viz. "The Vice-Presidents, Committee, and Stewards," was proposed by Mr. Maton and responded to by Mr. J. T. Bolding.

In the course of the evening subscriptions and donations to the amount of 836*l.* were announced, of which sum 576*l.* appeared in the President's list, including his own donation of 100*l.*

BLAST FURNACES.

THE first meeting of the session of the South Staffordshire Institute of Iron and Steelworks Managers was held in the Institute, Dudley, on the 8th inst. Mr. Herbert Pilkington, M.I.M.E., president, read a long and exhaustive paper on "Blast Furnace Plant: Equipment and Design." He said it would be difficult to name any metallurgical appliance which, during the last fifty years, had made such rapid and continuous progress as that of the blast furnace. If they looked back so far they found that the usual output of a furnace would be about 100 tons per week, with a coke consumption of 40 cwt. or thereabouts, whilst at the present time outputs of 700 to 900, and even 1,000 tons per week per furnace were not unusual; whilst with a coke consumption of 20 cwt. per ton, in America, they heard, with wonder and envy, of such prodigious outputs as 2,000 or more tons per week per furnace. Such an extraordinary change had been obtained by vast changes in plant and equipment, in many cases by a total revolution in ideas of furnace practice. Mr. Pilkington then reviewed the more recent changes, especially those which created a greater output with greater economy than usual. The walls of the room were filled with diagrams, some showing patents which saved labour and fuel, and others the best forms of furnaces in England and America. It was found, however, that some of the largest

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furnaces did not work so economically as the smaller ones. A long discussion followed the reading of the paper, and many of the speakers agreed with the conclusions of the writer, Mr. Hudson remarking that there was but little controversial matter in the paper: still it was full of interest.

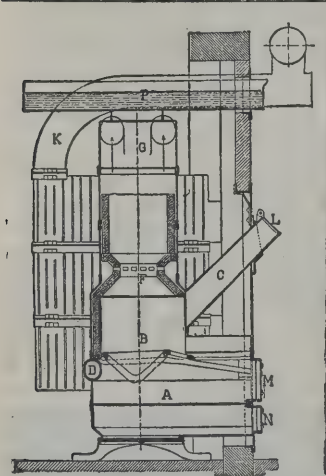
ASBESTOS IN THE UNITED STATES.

AN American technical journal supplies in a recent article much interesting information in regard to the production and uses of asbestos in the United States. The mineral is found in a comparatively narrow belt extending along the Piedmont region, or eastern slope of the Appalachian Mountains, from New York through Pennsylvania, Maryland, Virginia, North Carolina and South Carolina into Georgia. It is inferior in quality to the best that is mined in Italy or Canada. Its fibre is comparatively short and somewhat spindle-shaped, with occasional cross fractures, which not only render it brittle, but diminish its tensile strength. Asbestos is also found in considerable quantities in California and Wyoming, but this also lacks the essential quality of strength and fibre. The asbestos of Canada properly belongs to the chrysolite variety of formation. It occurs in serpentine in irregular veins, varying in thickness from a mere film to 6 inches. The fibre extends directly across the vein, is long and even as well as flexible, slightly elastic, and of great tensile strength. The production of asbestos in the United States has shown an annual decrease since 1882. In that year it was 1,200 short tons, in 1883 1,000 short tons, and in 1884 1,000 short tons. The product for 1885 was only 300 short tons, and this was again reduced to 200 short tons in 1886 and 150 short tons in 1887. In 1888 the product was 100 short tons, valued at 30 dols. per ton. In 1889 the only asbestos mined in the country came from California and amounted to 30 tons, valued at 1,800 dols. In spite of this a considerable amount of work was done in developing asbestos mines in Wyoming, but the product was not placed upon the market. The veins and pockets in these mines are said to be numerous, extending in all directions, and to vary in width from a few inches to over 4 feet. Some of the fibre is reported to be over 40 inches in length, but that so far obtained is somewhat brittle, though improving in quality as greater depth is reached. The capital invested in the industry amounted in 1889 to 42,600 dols., of which 41,500 dols. was in land and 600 dols. in buildings, machinery, &c. The total number of men employed in the industry was twelve. Asbestos is used in the manufacture of fireproof paints, roofing, piston packing, felt packing, fireproof cements, sheet and roll mill-boards, flooring, and for a covering for steam pipes and boilers. It is largely used in lining for fireproof safes, and is also made into yarn, cloth and paper. Non-consuming lamp wicks and fireproof drop curtains for theatres are now being made of this material. Some demand has also been created for its use in the manufacture of insulators for electric wires. The fibre of the American asbestos is more brittle and harsh than the foreign product and not so well adapted to the manufacture of spun and woven goods. It is said, however, to stand a greater degree of heat than the Canadian or foreign material, and it is more suitable for the manufacture of fireproof cement and paint, for which the length of fibre is not essential. The import of asbestos to the United States from abroad has rapidly increased from 9,736 dols. in value in 1880 to 263,393 dols. in 1889.

THE COCKSPUR STREET THEATRE.

A REPORT from the Committee on Theatres and Music Halls was submitted at the last meeting of the London County Council. It stated that an amended application had been received from Mr. W. Emden, on behalf of Messrs. Halling, Stone & Pearce, for the approval of ten drawings for a new theatre to accommodate about 1,120 persons, which it was proposed to erect upon the site known as "Waterloo House," being No. 2 Cockspur Street and Nos. 15, 16 and 17 Pall Mall East. In Mr. Emden's former applications, he proposed to place the stage at the Pall Mall end of the site, and the front of the house in Cockspur Street; but in this application the arrangement was reversed, and the stage would be at the Cockspur Street end, and the public entrances and exits in Pall Mall East. This would give the building a wider frontage. The plans now submitted would comply with the Council's present regulations, provided the following amendments were made to them:—(1) The provision of a separate exit into the 12-feet passage-way to the east of the building, and a better arrangement of steps to the staircase on the left side of the vestibule; (2) the substitution of Bostwick gates for those at the end of the passage-way mentioned above; (3) the alteration of the hydrants to positions to be approved by the Council; (4) the carrying down of such portions of the walls of the staircases as are now shown to be supported upon ironwork; (5) the im-

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provement of the ventilation and the lighting of the lavatories and dressing-rooms in the basement; (6) the improvement of the landing on the stage-exit staircase. The committee recommended that, as pending new regulations the Council is unable to take objection to the application on the ground of the site not being suitable for a new theatre, the plans be approved, subject to the amendments mentioned above being made to them.

Mr. Hutton, for Mr. Torr, moved the addition of the following words to the recommendation:—"But that the Council, whilst approving the plans of the building, is still of opinion that the site is very unsatisfactory for a new theatre, and that the Lord Chamberlain, the Commissioners of Woods and Forests and the applicant be so informed."

After some discussion the amendment was negatived.

ROLLED JOISTS FOR INDIA.

A CIRCULAR has been sent to the various Governments, Commissioners of Provinces, Residents, Agents to the Governor-General, consulting engineers and other heads of administrations by the Government of India respecting rolled joists. It appears that difficulty is sometimes experienced in meeting demands for rolled joists, in consequence of contractors not being able to obtain the exact sections demanded, or the load being specified in addition to the section, without details as to the "condition" of the girder or the limit of stress intended to be allowed. It is therefore suggested by the Public Works Department that demands for rolled joists should be accompanied by a detail of each item to enable the Store Department to supply suitable joists. The central test loads inserted in India Store Depôt Specifications of iron joists have hitherto been calculated on the basis that they should not produce a stress exceeding five tons per square inch of the area of either flange (the calculations are made for joists assorted at both ends, distance from centre to centre of bearings about 1 foot less than the length of the joist). As nearly all the iron joists supplied to India are of foreign (Belgian) manufacture, it is recommended that this limit of stress should not be exceeded. The difficulty of getting rolled iron joists of English manufacture is shown by the fact that, in answer to an advertised tender for them, the War Office received only two offers, and the price was upwards of 9*l.* per ton, whereas the same sections of foreign manufacture were offered at 6*l.* 5*s.* per ton. Rolled steel joists can generally be obtained at from 9*l.* to 10*l.* a ton, and in these the limit of stress may be taken at 7½ tons per square inch, which in some cases would allow of lighter sections being used as compared with iron; the amount of deflection of the steel joists with this stress would, however, be greater than that of the iron joists with a limit of 5 tons. It may be mentioned that although steel joists cost more per ton they will bear a greater strain, weight for weight, than iron joists, as is instanced by the particulars entered on the specifications. This will doubtless be borne in mind in deciding whether steel or iron joists should be demanded.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

18364. Richard Howard Leaker, for "Improvements relating to louvre windows."

18374. Thomas Simpson, for "An improved window-fastener."

18435. George Henry Bratt, for "Improvements in locks and latches."

18530. Thomas Wilson, for "An improved respirator to be used by firemen in burning buildings or smoky atmospheres."

18543. Thomas Garner, for "Improvements in stench-traps."

18602. Elie Samelson, for "Improvements in gearing for pulley-blocks and winches."

18617. Arthur Foster Smith, for "Improvements in bolts for doors, gates, windows and the like."

18770. William Brenton, for "Improvements in locking-bolts or fastenings."

18828. Sydney Crick, for "Improved means for fastening doors and the like."

18836. Christine Debrunner, for "Improvements in dust-pans."

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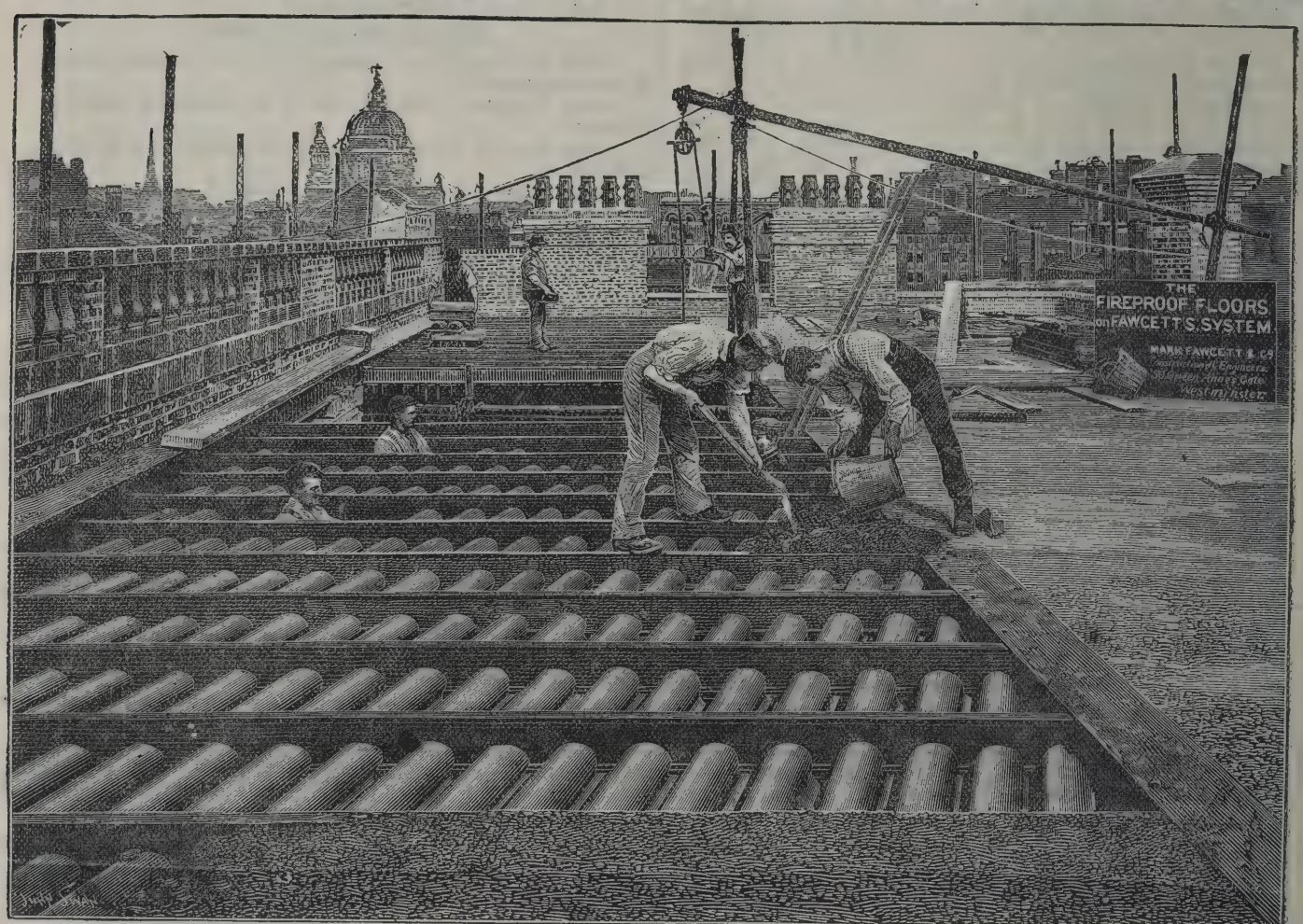
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Friday, November 13, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, NOVEMBER 20, 1891.

CONTRACTS OPEN.

ABERGAVENNY.—Dec. 2.—For Building Attendants' Dormitories at the Joint Counties Asylum. Mr. Alfred Swash, Architect, 5 Monk Street, Abergavenny.

APPERLEY BRIDGE.—Nov. 27.—For Building Church. Messrs. Kendall & Bakes, Architects, Calverley Chambers, Victoria Square, Leeds.

BATLEY.—Nov. 24.—For Building Five Dwelling-houses, Outbuildings and Boundary Walls. Mr. J. H. Brearley, Architect, Commercial Street, Batley.

BATLEY.—Nov. 30.—For Building Public Baths. Mr. Walter Hanstock, Branch Road, Batley.

BEXLEY.—Nov. 24.—For Constructing Pipe Sewers. Messrs. A. Williams & Son, 18 Great George Street, Westminster.

BEXLEY.—Dec. 2.—For Supplying and Fixing Cast-iron Street Name Tablets. Mr. E. R. Boulter, Surveyor, Bexley Heath.

BLACKPOOL.—Nov. 30.—For Telescoping 100-feet Gasholder with Two Extra Lifts and Supplying Lancashire Steam Boiler. Mr. John Chew, Gas Engineer, Gasworks, Blackpool.

BRADFORD.—Nov. 20.—For Shop Premises, &c. Mr. Rhodes Calvert, Architect, 4 Forster Square, Bradford.

BROCKLEY.—Nov. 24.—For Kerbing, Tar-Paving, Channelling and Metalling. Surveyor, Board of Works, Catford.

BURNLEY.—Nov. 24.—For Construction of Filtration Areas, Conduits, Under-drains, Effluent Outfalls, &c. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

CALVERLEY.—Nov. 24.—For Building Block of Four Good Houses. Mr. C. S. Nelson, Architect, 10 Park Row, Leeds.

CARDIFF.—Nov. 23.—For Alterations at Antelope Hotel. Mr. J. P. Jones, Architect, 27 Park Street, Cardiff.

CHARMINSTER.—Dec. 2.—For Erecting New Buildings at Dorset County Asylum. Mr. Thomas Coombs, 5 South Street, Dorchester.

CHELTENHAM.—Dec. 2.—For Building Slaughter-house. Borough Surveyor, Municipal Offices, Cheltenham.

CLEVEDON.—Nov. 30.—For Constructing Pier-head, with Band Stand and Pavilions. Mr. G. N. Abernethy, Engineer, 4 Delahay Street, Westminster, S.W.

CLYDACH.—Nov. 25.—For Building Conservative Club and Residence. Mr. Thomas Jones, Architect, Mount Pleasant, Clydach, Swansea Valley.

COCKERMOUTH.—Nov. 30.—For Classroom and other Alterations at Christ Church Sunday School. Rev. T. Knowles, Cockermouth.

CONISBROUGH.—Nov. 28.—For Building Caretaker's House at Cemetery. Mr. G. White, C.E., Mexbrough.

DARTFORD.—Nov. 26.—For Supply of Steam Fire-engine with Hose and Apparatus. Mr. J. C. Hayward, Local Board Department, Sessions House, Dartford.

DEVONPORT.—Nov. 24.—For Building Soldiers' Quarters. Lieutenant-Colonel W. H. Rathbone, Royal Engineers Office, Devonport.

DUBLIN.—Nov. 30.—For Taking-down Lattice Bridge and Providing and Erecting New Wrought-iron Plate Girders and Superstructure, also Central Girder and Cross Girders, &c., for Bridge over the Cusher. Mr. W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin.

DUNDEE.—Dec. 1.—For Cast-iron Pipes and Special Castings and Execution of Works for the Water Commissioners. Mr. George Baxter, Engineer, 7 Euclid Street, Dundee.

EXMINSTER.—Dec. 1.—For Additions to County Asylum. Mr. E. Harbottle, Architect, County Chambers, Exeter.

FENNY STRATFORD.—Nov. 30.—For Building Chapel and Sunday School. Mr. H. S. Smith, Fenny Stratford, Bucks.

HANWELL.—Nov. 21.—For Construction of Fire Escape Staircases and Supply of Fire Brigade Appliances at the London County Asylum. Mr. R. W. Partridge, 40 Craven Street, Strand, W.C.

HARROGATE.—For Additions to Craven Lodge. Mr. T. Butler Wilson, Architect, Central Chambers, Harrogate.

HEBBURN-ON-TYNE.—Nov. 21.—For Building Hotel. Mr. Stephen Piper, Architect, County Chambers, Westgate Road, Newcastle-on-Tyne.

ILKLEY.—Nov. 23.—For Building House. Messrs. Milnes & France, Architects, Bradford.

ILKLEY.—Nov. 24.—For Building Two Houses. Messrs. Isitt & Adkin, Architects, Queen Anne Chambers, Bradford.

IVYBRIDGE.—Nov. 24.—For Alterations, Godwell House. Messrs. Rendell & Symons, Surveyors, Newton Abbot.

KENDAL.—Nov. 24.—For Building Villa, Castle Haggs. Mr. John Stalker, Architect, Stramongate, Kendal.

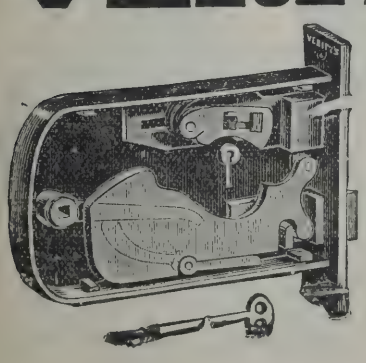
KINGSTON-UPON-THAMES.—Nov. 23.—For Supply of Broken Granite. Mr. H. A. Winser, Clattern House, Kingston-upon-Thames.

KIRKCALDY.—Nov. 21.—For Sheriff Court Buildings. Mr. Gillespie, Architect, St. Andrews, N.B.

LANCASTER.—Nov. 30.—For Building Post Office. Mr. H. W. Primrose, 12 Whitehall Place, London, S.W.

LEEDS.—Dec. 16.—For Building Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

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LICHFIELD.—Nov. 27.—For Building Infirmary. Mr. W. H. Woodroffe, Architect, 214 Great Dover Street, London, S.E.

LLANDUDNO.—Nov. 25.—For Reconstruction of the Alexandra Hotel. Mr. W. W. Thomas, Architect, 26 Lord Street, Liverpool.

LONDON.—Nov. 24.—For Alterations and Additions to London Central Meat Markets. Mr. Henry Blake, Sewers Office, Guildhall.

MELTON MOWBRAY.—Nov. 24.—For Laying-out Cemetery Ground, Building Chapel, Lodge, &c. Mr. R. Barker, Local Board Offices, 5 Sherard Street, Melton Mowbray.

MIDSOMER NORTON.—Nov. 23.—For Constructing Precipitation Tanks, Filter Beds, &c., at Proposed Sewerage Outfall. Mr. C. N. Lailey, 16 Great George Street, Westminster, S.W.

NELSON.—Nov. 23.—For Joiner and Carpenter Work at New Sewage Works. Mr. J. A. Crowther, Borough Surveyor.

NEWBOTTLE.—Nov. 24.—For Additions to Co-operative Buildings, Erecting Warehouse, Stables, Cart Shed, &c. Mr. G. Scott, Secretary, Newbottle, Fence Houses.

NEW BRIGHTON.—For Building Nine Houses. Mr. W. A. Jackson, Architect, 67 Stanley Street, Liverpool.

NEWRY.—Nov. 21.—For Building Town Hall and Municipal Offices. Mr. Wm. Batt, M.R.I.A., Garfield Chambers, Royal Avenue, Belfast.

OVENDEN.—Nov. 20.—For Weaving Shed, Warehouse and Offices. Mr. J. F. Walsh, Architect, Waterhouse Chambers, Halifax.

PETERCULTER.—Nov. 26.—For Building House. Messrs. Jenkins & Marr, Architects, 16 Bridge Street, Aberdeen.

PETERHEAD.—Nov. 24.—For Building Coastguard Station. Director of Works Department, Admiralty, 21 Craven Street, London, W.C.

PORTREE.—Nov. 20.—For Building Parsonage. Messrs. Ross & Macbeth, Architects, Inverness.

PRESTON.—Nov. 30.—For Building Brick and Stone Wall to Convent Grounds. Messrs. Myres, Veevers & Myres, 15 Chapel Street, Preston, Lancashire.

QUEENSBURY.—Nov. 21.—For Building Dwelling-house and Five-Horse Stable. Mr. John Drake, Winterbank, Queensbury.

RADCLIFFE.—Nov. 28.—For Additions to Stables, &c., Town's Yard. The Surveyor, Local Board Office, Radcliffe.

RICHMOND.—Nov. 30.—For Constructing Pipe Sewer. Mr. F. Wentworth-Shields, 6 Delahay Street, Westminster, S.W.

RUABON.—Jan. 1.—For Building Policeman's House, Upper Ponkey. Major T. J. Leadbetter, County Buildings, Wrexham.

SHELF.—Nov. 28.—For Additions to Farm Buildings at Shoulder-of-Mutton Inn. Mr. John Drake, Architect, Winterbank, Queensbury.

SHELF.—Nov. 23.—For Building Stabling and Warehouse, Clough Mills. Messrs. Brayshaw & Dixon, Architects, Bowling Old Lane, Bradford.

SOUTHAMPTON.—Nov. 30.—For Additions to Eastern District Board School. Mr. E. T. Howell, Architect, 28 Portland Street, Southampton.

ST. HELEN'S.—Nov. 26.—For Building Engine and Boiler Houses, Chimney-shaft, Mill-houses, &c., and Supplying Softening and Filtering Plant, Horizontal Engine, &c. Mr. D. M. F. Gaskin, Engineer, Town Hall, St. Helens.

TENDERS.

ALDERBURY.

For Lodge, Coachhouse, Stabling, &c., Alderbury, near Salisbury, for Mr. Walter M. Osmond, of Calcutta and Salisbury. Mr. FRED BATH, F.R.I.B.A., F.S.I., Architect. Quantities supplied.

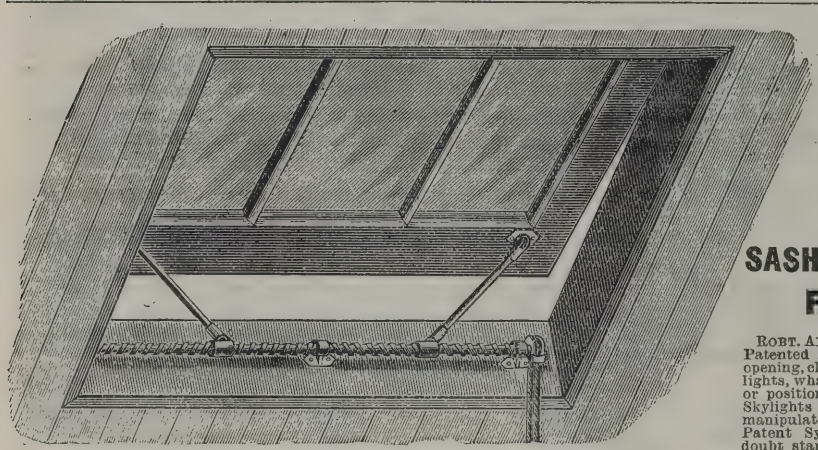
		Reduced Tender.
Edward Witt, Salisbury	£2,912 10 6	£2,656 0 6
H. J. Kite, Salisbury	2,618 0 0	2,307 0 0
R. R. Facey, Taunton	2,595 14 10	2,430 14 10
W. J. & C. S. Young, Salisbury	2,570 0 0	2,173 0 0
CHAS. MITCHELL, Woodfalls, Salisbury *	2,334 0 0	2,199 4 0
C. A. Hayes, Bristol	2,057 14 9	2,012 14 9

* Accepted for all except stable.

BIDEFORD.

For Building the Devon and County Bank, Bideford. Mr. A. THORNE, Architect, Barnstaple.

Sillifant & Sanders, Barnstaple	£1,769 10 0
Sanders & Ridge, Barnstaple	1,748 0 0
Cock & Lamerton, Bideford	1,695 10 0
E. ELLIS, Bideford (*accepted*)	1,614 15 6

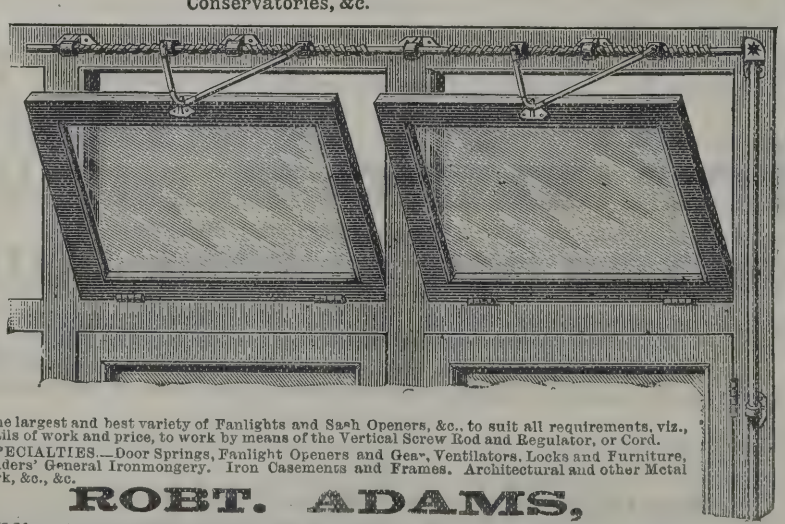


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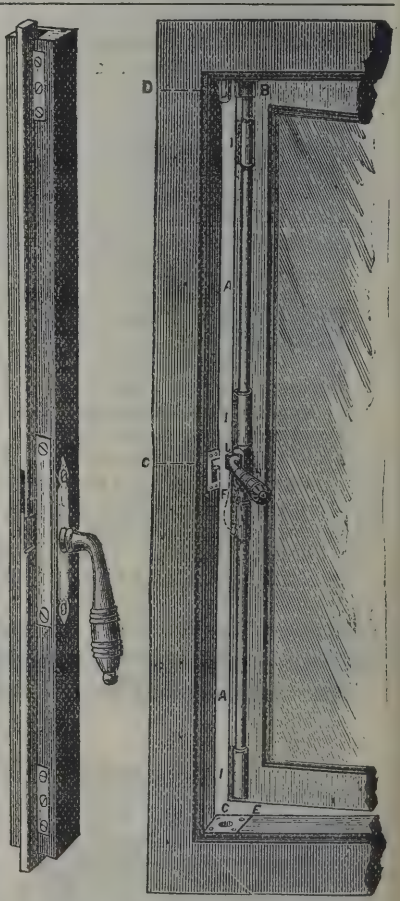




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For New Buildings, Lewin's Mead, Bristol, for the Bristol United Brewery Company, Limited. Mr. W. BRUCE GINGELL, Architect, Bristol.

T. H. Brown, Bristol	£1,416 0 0
E. Walters, Bristol	1,395 0 0
Eastabrook & Sons, Bristol	1,394 0 0
Neale Bros., Bristol	1,364 0 0
Brock & Son, Bristol	1,350 0 0
E. Gay, Bristol	1,348 0 0
W. Veals, Bristol	1,347 0 0
H. A. Forse, Bristol	1,319 0 0
Cowlin & Son, Bristol	1,317 0 0
Stephens, Bastow & Co., Bristol	1,299 0 0
E. Love, Bristol	1,297 0 0
E. T. Hatherly, Bristol	1,297 0 0
J. Perkins, Bristol	1,280 0 0

CARLISLE.

For Building Superstructure of Catholic Church, Warwick Square, Carlisle.

T. Creighton, builder's work	£3,600 0 0
H. & W. Bladwell, Bath stone	2,360 0 0
J. Plaskett, carpenter	1,980 0 0
Anderson, plumbing	353 0 0
Kirk & Robley, painting	274 0 0
Nanson, slating	150 0 0
Ferguson, plastering	16 0 0

CHADWELL HEATH.

For Erection of Two Villas, Chadwell Heath, Essex, for Mr. F. Chandler. Messrs. WIGG, OLIVER & HUDSON, Architects, 7 Bedford Row, and 80 Leman Street. No quantities.

C. Wilson	£685 0 0
Barker	632 0 0
Dowsing & Davis	625 0 0
Walter	623 0 0
Death	620 0 0
Watson	600 0 0
Barnes	585 0 0

DAVENTRY.

For Repairs to the Moot Hall, Daventry.

Wapples	£83 10 0
Bazley	82 0 0
T. Adams	72 0 0
PERKINS (*accepted*)	71 13 0

DOVER.

For Building Premises, Market Square and Market Street, Dover, for Mr. Henry Hart. Mr. EDWARD W. FRY, Architect, St. Martin's House, Dover. Quantities by Architect.

Webster, Folkestone	£5,850 0 0
J. J. Wise, Deal	5,770 0 0
W. & J. Denne, Walmer	5,650 0 0
G. Denne & Son, Deal	5,450 0 0
Lewis & Son, Dover	5,425 0 0
Hayward & Paramour, Folkestone	5,398 0 0
Stiff, Dover	5,183 0 0
Bromley, Dover	5,040 0 0
W. T. Dowle, Dover	4,946 0 0
Richardson, Dover	4,800 0 0
W. G. Lewis, Dover	4,740 0 6
AUSTEN & LEWIS,* Dover	4,719 0 0

* Accepted with modifications.

HERNE BAY.

For Building Slaughter-house, Stabling and Premises, Richmond Street, Herne Bay, for Mr. F. W. Boulding. Mr. HARRY FARLEY, Architect, Richmond Street, Herne Bay. Quantities not supplied.

G. Admans, Herne Bay	£375 10 0
E. Taylor, Herne Bay	369 12 0
A. S. Ingleton, Herne Bay	348 0 0
C. Welby, Herne Bay	310 0 0
E. T. J. ADAMS, Herne Bay (*accepted*)	260 0 0

HERRINGTON.

For Building Dwelling-house for Curate, Lady Missioner and Caretaker, adjoining Herrington Church, for the Right Hon. the Earl of Durham. Mr. J. GIBSON COWE, Architect, Lambton Office, Fence Houses.

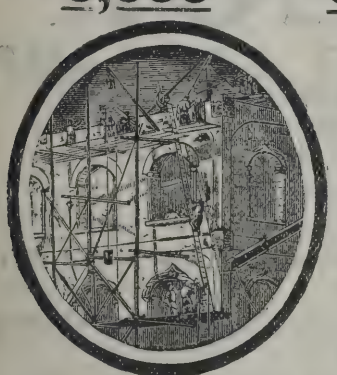
R. D. Harrison, Houghton-le-Spring	£1,855 0 0
J. Jennings, Chester-le-Street	1,626 13 0
R. Hudson, jun., Sunderland	1,617 0 0
I. OATES, Chester-le-Street (*accepted*)	1,558 5 0

HINCKLEY.

For Brindle Brick Fence Wall, near the Reservoir Road, Hinckley.

T. & G. Harrold, Hinckley	£182 16 0
T. Jones, Hinckley	180 12 0
A. Jeffcote, Hinckley	177 12 0
Greaves & Farmer, Hinckley	155 0 0
J. & W. HARROLD, Hinckley (*accepted*)	140 0 0

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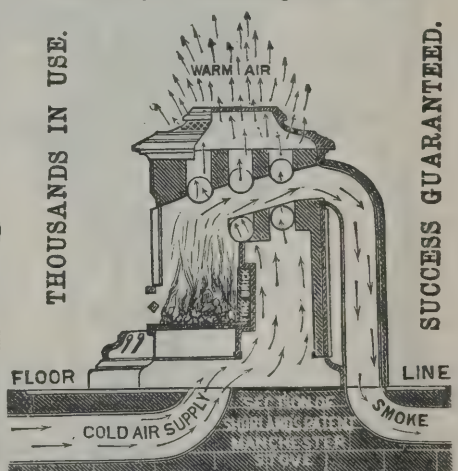
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LONDON.

For Additions and Alterations to the Public Baths, Marshall Street. Messrs. SPALDING & CROSS, Architects.

John Mowlem & Co.	£7,315 0 0
William Downs	7,253 0 0
Stephens, Bastow & Co.	7,099 0 0
A. Kellett	7,035 0 0
F. G. Minter	6,950 0 0
J. Outhwaite & Son	6,875 0 0
William Brooks	6,800 0 0
Neave & Neave	6,712 0 0
John F. Robson	6,673 0 0
Richard G. Battley	6,624 0 0
James Smith & Sons	6,586 0 0
B. E. Nightingale	6,547 0 0
Balaam Bros.	6,468 0 0
Jones, Richards & Co.	6,397 0 0
William Brass & Son	6,393 0 0
Rowe Bros.	6,350 0 0
H. L. Holloway	6,333 0 0
W. & H. Castle	6,291 0 0
Gould & Brand	6,280 0 0

For Building Board School, Mulgrave Place, Greenwich, for 805 Children. Mr. T. J. BAILEY, Architect.

		Extra if Brickwork in Cement.
J. T. Chappell	£19,931 0 0	£320 0 0
John Mowlem & Co.	19,574 0 0	327 0 0
Lathey Bros.	19,524 0 0	359 0 0
T. Boyce	18,400 0 0	270 0 0
Holliday & Greenwood	18,257 0 0	312 0 0
Hart Bros.	17,863 0 0	305 0 0
William Downs	17,416 0 0	261 0 0
Foster & Dicksee	17,278 0 0	198 0 0
J. W. HOBBS & Co., Lim.*	17,210 0 0	290 0 0
Holloway Bros.	16,975 0 0	300 0 0

* Recommended for acceptance. Messrs. Holloway wrote stating that the glazed-brick dado-facing has been priced as "salt-glazed" instead of as "second chocolate-glazed," and that the difference in value of these bricks amounts to 653*l.* 15*s.*, explaining how the mistake arose, and offering to carry out the work if the Board will permit them to use the former instead of the latter bricks.

LONDON—*continued.*

For Enlargement of Board School, Orange Street, Borough, by 583 Places; Erecting Cookery, Laundry and Technical Rooms; New Covered Playgrounds, and W.C.'s for all Departments; New System of Drainage throughout the School; New Cloakrooms and Lavatories, and New Staircases for the Boys and Girls'; New Teachers' Rooms, and Stock Rooms, &c., and Enlarging Schoolkeeper's House. Mr. T. J. BAILEY, Architect.

		Extra if Brickwork in Cement.
Hart Bros.	£16,533 0 0	£295 0 0
Treasure & Son	16,187 0 0	200 0 0
S. & W. Pattinson	15,816 0 0	156 0 0
J. Marsland	15,675 0 0	200 0 0
J. Smith & Sons	15,496 0 0	225 0 0
Lathey Bros.	15,220 0 0	236 0 0
J. Tyerman	15,045 0 0	320 0 0
W. Downs*	13,852 0 0	175 0 0

* This Contractor adds, "Subject to award of arbitration maintaining current rate of wages."

For Enlargement of Board School, Canonbury Road, Islington, by 443 Places, Erecting single Cookery Centre and new W.C.'s, and Providing Heating Apparatus for the whole School, and new system of Drainage throughout.

		Extra if Brickwork in Cement.
Treasure & Son	£14,269 0 0	£190 0 0
J. Willmott & Sons	12,860 10 0	200 0 0
W. M. Dabbs	12,585 0 0	98 0 0
W. Gregor & Son	12,360 0 0	200 0 0
Killby & Gayford	12,337 0 0	102 0 0
J. Grove & Son	12,131 0 0	95 0 0
F. J. Coxhead	11,949 0 0	171 17 2

For Building Divisional Offices, Dagleish Street, Limehouse, for the School Board. Mr. T. J. BAILEY, Architect.

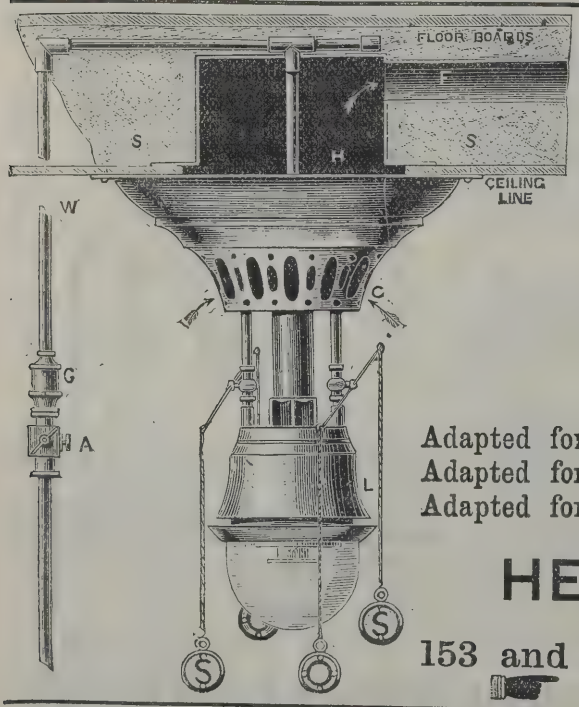
	Extra if Brickwork in Cement.
S. & W. Pattinson	£2,840 0 0
Atherton & Latta	2,790 0 0
J. T. Chappell	2,780 0 0
Holloway Bros.	2,700 0 0
W. M. Dabbs	2,699 0 0
E. Lawrance & Sons	2,670 0 0
Killby & Gayford	2,663 0 0
T. Boyce	2,582 0 0
Holliday & Greenwood	2,577 0 0

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LONDON—*continued.*

For New Baths, Lavatories and Sundry Repairs at the Schools, Upper Tooting, for the Guardians of the Westminster Union. Mr. JOHN WALDRAM, C.E., Surveyor, 13 Buckingham Street. Quantities supplied by Mr. P. J. Waldram.

Colwill	£797 0 0
Shiers	666 0 0
Lansdowne & Co.	665 0 0
Co-operative Builders	659 0 0
Hunt	656 0 0
Lilly	647 0 0
Lorden & Sons	630 0 0
Allen & Sons	616 0 0
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Somerford & Son	579 0 0
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Williams & Richards	570 0 0
Johnson & Manners	565 0 0
Young & Lonsdale	550 0 0
Garrett & Son	549 0 0
W. JOHNSON, Limited (*accepted*)	539 0 0
Wallis	509 0 0
Cowper	495 0 0
Surveyor's estimate	572 10 0

For Painting, Repairing and Cleansing Works at the Abbey Mills Pumping Station, for the County Council.

J. Mowlem & Co.	£1,597 0 0
W. Gibbons & Son	1,400 0 0
E. Proctor	980 0 0
G. Munday & Son	927 0 0
Vigor & Co.	796 10 0
W. H. Marsland	732 0 0
C. Court	450 0 0
C. N. Phillips	399 0 0
A. J. Prout	395 0 0

For Erecting a New Chimney-shaft for the Heating Apparatus, Oban Street School, Bromley, to the Entire Height of the Building.

Atherton & Latta	£159 0 0
J. T. Robey	150 0 0
Kilby & Gayford	147 0 0

LONDON—*continued.*

For Providing Heating-apparatus on the Low-pressure Hot-water System at Board School, Wellington Road, Barnsbury, now in Course of Erection.

John Grundy	£695 0 0
Fraser & Fraser	407 0 0
J. & F. May	395 0 0
Comyn Ching & Co.	388 0 0
C. P. Kinnell & Co.	375 0 0
Purcell & Nobbs	363 0 0

For Alterations and Additional Fittings for the Laboratory, Clyde Street School, Deptford.

Davis Bros.	£233 0 0
J. Marsland	148 0 0
W. Holding & Son	129 15 0

For Alterations to the Thistle and Crown, St. Martin's Lane, W.C., for Mr. Philip Young. Mr. C. J. C. PAWLEY, Architect, 2 Prince's Mansions, Victoria Street, S.W.

Holliday & Greenwood	£1,177 0 0
Gill Bros.	1,117 0 0
Patman & Fotheringham	1,095 0 0
Campbell	1,050 0 0
Taperell & Davis	1,040 0 0
Prestige & Co.	1,040 0 0

For Rebuilding the Lord Nelson Beerhouse, Bidder Street, Canning Town, for Messrs. Ind, Coope & Co. Messrs. WIGG, OLIVER & HUDSON, Architects, 7 Bedford Row, and 80 Leman Street. No quantities.

		If with Additional Room.
Norton & Son	£765 0 0	£825 0 0
G. E. Weston	752 0 0	777 0 0
North Bros.	745 0 0	800 0 0

For Street Improvement Works, Poplar.

Rothbury Road.

L. Griffiths & Co.	£427 0 0

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L. Griffiths & Co.	410 0 0

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L. Griffiths & Co.	£895 0 0

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For Building Four Cottages, Morthoe, for Mr. W. Sanders, Auctioneer. Mr. A. THORNE, Architect, Cross Street, Barnstaple.

W. J. Brooks, Ilfracombe	£698 0 0
H. Slee, Woolacombe	550 0 0
T. BEER, Woolacombe (*accepted*)	523 0 0

NEWPORT.

For Proposed Extension of Model Lodging-house, for the Newport Model Lodging-house Co., Limited. Mr. E. A. LANSDOWNE, Architect, 26 High Street, Newport, Mon. Quantities by Architect.

E. Richards, Newport	£2,700 0 0
J. Linton, Newport	2,495 0 0
W. Blackburne, Newport	2,289 0 0
Morgan & Roberts, Newport	2,150 0 0
W. Price, Newport	2,074 0 0

PONTYPOOL.

For Building Assembly Rooms, Shops and Premises, Pontypool, near Newport. Mr. E. A. LANSDOWNE, Architect, 26 High Street, Newport, Mon. Quantities by Architect.

Welsh, Hereford	£6,490 0 0
W. Price, Newport	5,788 0 0
H. Parfitt, Pontnewydd	5,389 0 0
Stephens & Bastow, Bristol	5,299 0 0
Morgan & Evans, Pontypool	4,997 0 0
J. LINTON, Newport (*accepted*)	4,895 0 0

RAINHAM.

For Reinstating after Fire the Phœnix Hotel, Rainham, Essex, for Messrs. Ind, Coope & Co. Messrs. WIGG, OLIVER & HUDSON, Architects, 7 Bedford Row and 80 Leman Street. Quantities by C. Stanger & Son.

J. H. Cocks	£1,450 0 0
T. Little	1,415 0 0
W. Gladding	1,387 0 0
W. Gregar & Son	1,237 0 0
T. Norton & Son	1,198 0 0
Dowsing & Davis	1,193 0 0
John Bentley	1,174 0 0
J. S. HAMMOND & SON (*accepted*)	1,075 0 0

SWINDON.

For Erecting Detached Residence, Bath Road, Swindon. Mr. W. H. READ, M.S.A., Architect, Corn Exchange, Swindon. W. CHAMBERS, Swindon (*accepted*).

NORTHAMPTON.

For Construction of Filter-beds at Coton Mill, near Guilsborough, for the Water Committee, Northampton. Mr. JOHN EUNSON, Engineer, Northampton. Quantities by Mr. S. J. Newman.

F. Barlow, Rothwell	£934 0 0

SELBY.

For Building Villa Residence, North Duffield, Selby, for Mr. J. V. Brooksbank. Mr. L. HARRIS, Architect, St. Andrew's Chambers, Park Row, Leeds.

W. Lolley, Leeds, brick and masonry	£763 10 0
R. Sunderland, South Milford, joiner	436 0 0
H. Braithwaite & Co., Leeds, plumbing, glazing, hot-water, &c.	175 12 9
J. Atkinson, Leeds, slater	108 0 0
Helmsley & Sons, Leeds, plasterer	86 0 0
C. E. Brooke, Heckmondwike, painter	42 0 0
G. Foster, Beeston, paperhanger	37 0 0

Leading and stock bricks found by the proprietor.

STAFFORD.

For Building Cellars, Ale Store and Stabling, Cherry Street, Stafford, for Messrs. C. E. Morgan & Son. Mr. NICHOLAS JOYCE, Architect, Stafford. Quantities by Mr. N. Joyce.

Adams & Pemberton, Stafford	£1,494 0 0
A. F. Whittome, Stafford	1,489 0 0
F. Espley, Stafford	1,436 0 0
W. Reynolds, Stafford	1,350 0 0
JAMES JERVIS, Stafford (*accepted*)	1,296 0 0

WITHAM.

For Building Schoolrooms, Extension of Laundry, at School, Witham, for the Managers of the South Metropolitan School District. Mr. GEORGE ROSS, Architect. Quantities by Messrs. R. L. Curtis & Sons.

John Marsland, Walworth	£1,410 0 0
A. Moss & Co., Chelmsford	1,300 0 0
Joseph Smith, Witham	1,249 0 0
H. Gozzett & Son, Maldon	1,220 0 0
F. J. Coxhead, Leytonstone	1,189 0 0
Charles Richards, Witham	1,175 4 0
G. Grimwood & Sons, Sudbury	1,163 0 0
G. Dobson, Colchester	1,160 0 0
ERNEST WEST, Chelmsford (*accepted*)	1,087 0 0

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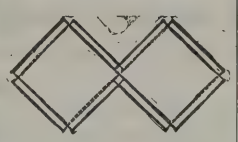
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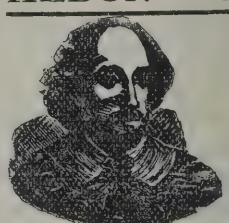
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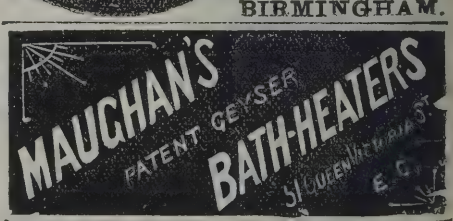
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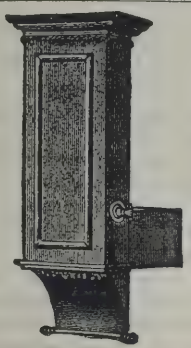


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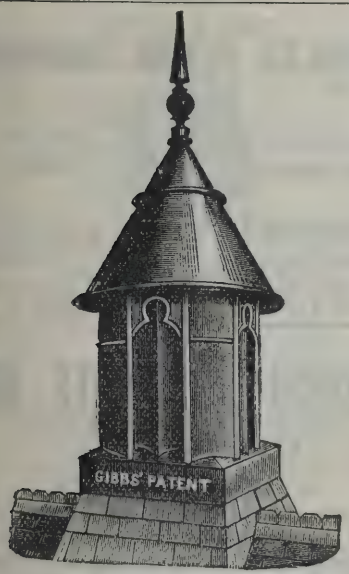
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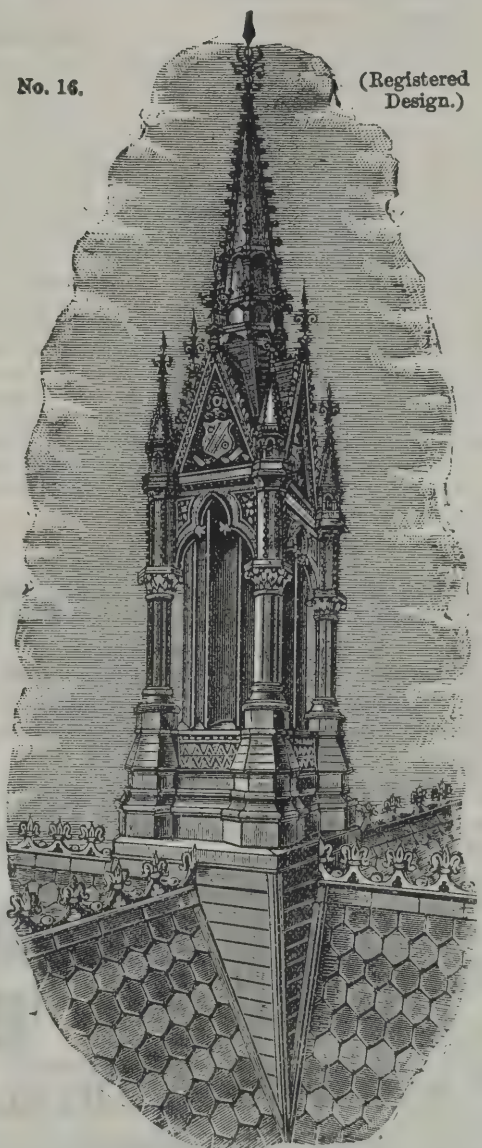


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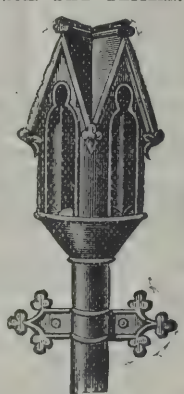
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E. Ellis, Bideford	£326 11 0
Sanders & Cook, Northam	298 10 0
L. Chapple, Northam	250 0 0
S. PRIOR, Westward Ho! (*accepted*)	243 15 0

WIDNES.

For Construction of a Concrete Engine Bed and Foundations, at Netherley Bridge Pumping Station, for the Widnes Local Board. Mr. I. CARR, Engineer, Widnes.

Hindley & Co., Liverpool	£919 4 0
Roberts Bros., Widnes	824 18 0
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P. Balmer & Co., Liverpool	726 0 0
H. LOCKWOOD, Manchester (*accepted*)	708 9 6

THE AWARD ON THE CARPENTERS' STRIKE.

As was anticipated, Mr. Macvicar Anderson has, as arbitrator, decided against the claims for increased wages of the carpenters and joiners, who for some time were on strike. He says:—"My award is that on and after the date hereof the code of working rules for carpenters and joiners in the London district shall be:—(1) The working time both in shops and on outdoor jobs to be 51¼ hours for 36 weeks in summer and 47 hours for 16 weeks in winter, equal to an average of 50 hours all the year round. The hour for commencing work to be 6.30 A.M. for the 36 summer weeks, and 7.0 A.M. for the 16 winter weeks. The hour for leaving off work on the first five working days of the week to be 5.15 P.M. for the 36 summer weeks, and 5 P.M. for the sixteen winter weeks, except in the depth of winter on outdoor jobs, when it is to be 4.30 P.M. The hours for leaving off work on Saturdays to be 12 o'clock all the year round. Half an hour to be allowed for breakfast every working day, and one hour to be allowed for dinner on each of the first five working days of the week, except in the depth of winter on outdoor jobs, when half an hour only shall be allowed. The sixteen winter weeks to be reckoned eight weeks on each side of Christmas. (2) The standard rate of wages in shops and on jobs to be 9*d.* per hour. (3) Overtime, when worked at the request of the employers, but not otherwise, to be paid at the following rates per hour:—From 5.15 P.M. in summer and 5 P.M. in winter to 8 P.M., 1*s.*; from 8 P.M. to 10 P.M., 1*s.* 3*d.*; from 10 P.M. to time of starting next morning, 1*s.* 6*d.*; from 12 noon, Saturday, to 4 P.M., 1*s.*; from 4 P.M. on Saturday to time of starting on Monday, 1*s.* 6*d.* No overtime to be reckoned till each full day has been made. (4) Men who are sent from the shop or job, including those engaged in London and sent to the country, shall be allowed, as expenses, 1*s.* per day for any distance over six miles from the shop or job, exclusive of travelling expenses, time occupied in travelling and lodging money. (5) Employers shall provide a lock-up place on jobs, where practicable, and shall take reasonable precautions for securing the safety of workmen's tools, but without incurring responsibility for loss. (6) Employers shall provide, both in shops and on jobs, where practicable and reasonable, a suitable place for the workmen to have their meals, with a labourer to assist in preparing them. (7) Men who are in receipt of full wages, and who have been employed for forty-nine hours in summer, or for forty-five hours in winter, shall on discharge receive one hour's notice, to be occupied so far as practicable in grinding tools, with one hour's pay in addition.

BUILDING AND BUILDERS.

THE station hotel at Perth, which was opened about two years ago, is to be enlarged by the addition of thirty-five bedrooms. The plans have been prepared by Mr. Andrew Heiton, architect; and Messrs. James Hay & Son, Perth, have secured the contract for the work.

IT is stated that the Post-Office authorities contemplate the erection at an early date of a new post-office for Falkirk. A site for the building has been purchased in Vicar Street, within a few minutes' walk of Grahamston railway station.

THE Worcester Board of Guardians have adopted a committee recommendation that the cottage home system be adopted by the Worcester Union in the erection of buildings for the accommodation of the children. Also that the committee be authorised to confer with the architects, Messrs. Rowe & Sons, as to the accommodation that should be provided for the children, and to obtain the plans for the erection of the buildings on the principle of cottage homes.

THE Lichfield Board of Guardians have decided on the erection at the workhouse of a new dining-hall, kitchen, scullery,

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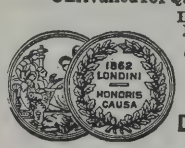
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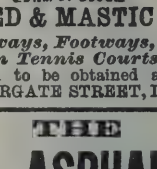
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AT a recent meeting the governors of Kendal Grammar School resolved to proceed forthwith with the erection of a new schoolhouse capable of accommodating forty boarders.

AT Dumbarton the Combination Poor-house Committee have adopted plans prepared by Messrs. M'Whannel & Rogerson, architects, Glasgow, for additions to and alterations on the house at a probable cost of 3,400*l.* The plans provide for an enlarged dining-hall capable of accommodating 200, and over this two storeys, giving accommodation for ninety-two additional beds, increased accommodation for the governor and matron, enlarged kitchen and stores and enlarged workshops for the male inmates.

THE Coatbridge Town Council have approved of a recommendation by the Joint Fever Hospital Committee to build additional premises for the housing of the officials, the estimated cost being 600*l.*

A NEW gymnasium at Warrington, built from the plans of Mr. J. E. Wright, architect, by Mr. W. Taylor, contractor, has been opened.

THE parish church of Tallaght has lately been restored. In the eighth century a monastery was founded close to the site of the present church by a Saint Maelrune. All trace of his work has long since disappeared, with the exception of an immense font, measuring some 5 feet in diameter, roughly hewn out from a granite boulder, and which tradition assigns to St Maelrune. Overshadowing this hoary relic of bygone days is another interesting relic of the past in the form of a grand old Anglo-Norman tower, with its ivy-clad walls standing as perfect and strong as on the day when the Anglo-Norman masons completed their work six centuries ago.

THE foundation of the new town hall for Colne has been laid. The work is being carried out from the designs of Mr. Mallinson, architect, and will cost about 8,000*l.*

A SCHOOL erected for the Glasgow School Board, Whitehill Street, Dennistoun, from the designs of Mr. W. F. Salmon, at a cost of 15,050*l.*, has been opened.

IN last week's issue we gave a description of the alterations and extensions carried out upon the Leith Town Hall Buildings. The work, furnishings and decorations have been carried out from plans and designs prepared by Mr. James Simpson, architect, Leith.

THE contract for the erection of a new Board school for Devonport in Stuart Road has been secured by Messrs. Lethbridge & Sons, of the Tracey Building Yard, Plymouth. The price of the contract is about 7,000*l.*

THE First Commissioner of Works has written to Mr. George Dew, the secretary of the London Building Trades Committee, announcing that after "careful and prolonged consideration" eightpence an hour is to be substituted for sevenpence halfpenny for the painters employed on Government work executed by Messrs. Holland & Hannen, who hold a contract from the office of the Chief Commissioner of Works.

IN our issue of November 6 the list of accepted tenders for the proposed public library, museum and school of art at Carlisle was published. Messrs. Bell have since withdrawn their tender, and the next lowest, that of Messrs. J. & W. Baty, has been accepted at 5,871*l.*

TRADE NOTES.

FOR heating the Orrell Free Church, near Wigan, Grundy's patent warm-air ventilating firegrates are being supplied by Mr. John Grundy, of London, and Tyldesley, near Manchester.

A WROUGHT-IRON SCREEN across the chancel of All Saints Church, South Acton, has just been completed and fixed by Messrs. Jones & Willis, under the superintendence of Mr. Edward Monson, jun., architect. The firm have also in hand a screen of similar character, which, when completed, will be fixed at St. Clement's Church, Fulham Palace Road.

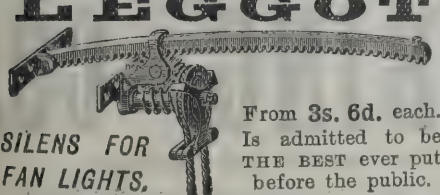
THE new hospitals at Low Moor are being ventilated throughout by means of Shorland's patent exhaust-roof ventilators and vertical inlet tubes, the same being supplied by Mr. E. H. Shorland, of Manchester.

THE improved patent "Æolus" invisible automatic exhaust roof ventilators of Messrs. Baird, Thompson & Co., ventilating engineers, of London and Glasgow, have been adopted for the new Sevenoaks Weald Schools.

THE offices of the Kennedy Buck Machine Co., which we described in *The Architect* a week or two back, are situated at 39 Lombard Street, London, E.C.

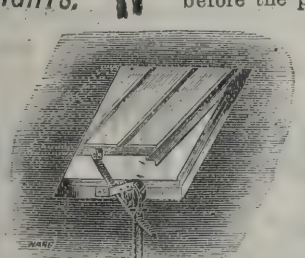
A NEW church and schools have been erected at Bedlington. The question of the ventilation received the most careful consideration, and it was decided, after inquiring into the merits of the various systems, that the best was that of

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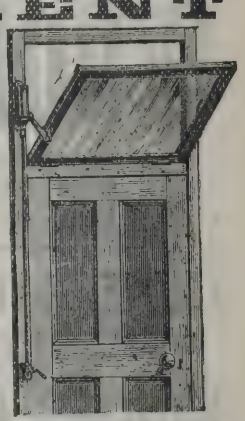
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The Best, Cheapest, and Most Effective in the World. 1A CRESCENT, MINORIES, LONDON, E.C.

the "Climax" Ventilating Company, 15 Great George Street, Westminster, which has been adopted.

MESSRS. J. CONSTANTINE & SON, of 23 Oxford Street, Manchester, have recently fitted the whole of the baths, and carried out the heating and ventilation of the new Turkish baths at West Hartlepool. Messrs. Constantine have received a testimonial from the directors, stating that they were "highly satisfied with everything."

VARIETIES.

THE sea has been steadily encroaching on the frontage of the parish of Lancing, Sussex, and has frequently made gaps in the road between Worthing and Lancing. The gap now extends for a distance of about 400 feet, and measures from 10 feet to 15 feet deep, and the frontage of about 1,500 yards has no protection against the encroachment. After years of discussion, a committee has been formed, partly of members of the Worthing Town Council and partly of some of the inhabitants of Lancing and others interested; and the committee has instructed Messrs. R. B. Grantham & Son, of London, to prepare plans and specifications for the construction of a number of groins and other works for the protection of the frontage. The groins are to be laid out on the principle which has been adopted with great success on that coast between Lancing and Shoreham, and in Middleton parish, near Bognor.

THE schemes submitted for the Leighton Buzzard water supply and sewerage by Mr. H. Bertram Nichols, C.E., of Birmingham, under the motto "Forward," which were adjudged the best, in the competition which took place last year, by the late parochial committee, have been adopted by the newly-constituted Local Board, and Mr. Nichols has unanimously been appointed engineer to carry out the works. In the water supply scheme it is proposed to pump the water from the Lower Greensand formation, the requisite pressure and storage being obtained from a water tower. The sewerage scheme is partly on the Shone system, four ejector stations being proposed. By this means the whole of the sewers will be confined to the public roads. Something like one-half of the sewage will be raised by pneumatic power into the gravitating main outfall sewer, which sewer will receive many arterial gravitation sewers. The sewage disposal works will be situated to the north of the town, on land adjacent to the River Ouzel. They will be constructed above flood level of the river, and this was demonstrated during the recent heavy floods, when the members of the Board, with Mr. Nichols, visited the proposed site. Adequate flushing of the sewers is proposed, and special means of ventilation will be taken in connection with the compressed air from the ejectors, in addition to the ordinary and usual methods adopted. The population of Leighton Buzzard is about 7,000, and the cost of the engineering works is estimated at about 15,000*l.*

AT an estimated cost of 1,700*l.* new drainage works are to be constructed at Flamborough. The plans adopted have been prepared by Mr. Dyer, of Bridlington Quay. The contract has been let to Mr. Robinson, of Hull.

THE ancient fifteenth-century screen in Manaton Church, which is situated on Dartmoor, five miles from Moretonhampstead, is to be restored. The screen is one of the finest in Devonshire; it runs the whole width of the church, and still has a good deal of its original colouring. The restoration has been placed in the hands of Mr. Edmund Sedding, architect, Plymouth; and Messrs. Rashleigh, Pinwill & Co., of the same town, have been entrusted with the work.

DR. NEILSON, the medical officer of the union, in his annual report, says the improvements that have been made in the lavatories, bath-rooms, &c., in the Basford Union Workhouse hospitals are most satisfactory. Ventilation of the hospital is well effected and warmth maintained, and both may be regarded as excellent. The heating has been improved by the adoption of Shorland's Manchester grates, and the lighting by means of Wenham lights, with pipe flues utilised in extracting the vitiated air. The lighting and ventilation, together with the refitting of the lavatories and baths with the most modern and approved fittings, have been carried out by Messrs. Humphrey & Co., of Nottingham, under the direction of the architect, Mr. Herbert Walker, C.E., Newcastle Chambers, Nottingham.

ACCORDING to the *Standard*, a movement is on foot for the purchase for the nation of an absolutely unique gold cup, not long ago the property of Baron Pichon, of Paris, who valued it at 20,000*l.* It is offered to the country by its present possessor, Mr. Wertheimer, the dealer, for the sum of 8,000*l.*, which he himself paid for it, and he joins, it is said, with several distinguished amateurs in a subscription towards raising a considerable part, or it may be, even the whole of this sum. The cup, which is some 6 inches high, and wrought exquisitely, is very possibly of English origin. It was, in any case, during several generations, among the English crown jewels. It

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ceased, we believe, to appear in the inventory of these about the period of James I., and for a long time subsequently its home was a convent near Burgos.

ABOUT 7,000 men are employed on the construction of the canal through the province of Schleswig-Holstein to connect the North Sea with the Baltic. About 7,000 workmen are employed in the construction. They are in 38 camps, of 160 to 500 men each, each camp having its own executive office and sleeping barracks. The common labourers get about 70 cents. a day, and the foreman and skilled labourers get from 95 cents. to 1.15 dols. a day. The mechanical appliances are 27 dry dredgers, 24 floating dredgers, 97 locomotives, about 62 miles of track, 2,700 dirt-carts, 4 elevators, 15 steamboats, 51 receptacles for dredging implements and 37 steam-pumps. Along the line are several forges and two brickyards.

UPON the formation of the Salt Union, Mr. Joseph Verdin, whose works had been absorbed by the union, gave the sum of 26,000*l.*, to form the nucleus of a fund for providing compensation to property owners in the salt district who suffered from the subsidence. The recent passing into law of the Salt Subsidence Compensation Bill has obviated the necessity for recourse to any special fund, and Mr. Verdin has consequently decided to hand 6,000*l.* over to the Victoria Infirmary, Northwich, and to devote the 20,000*l.* remaining to the promotion of technical education in Northwich and Wensford.

A BILL will be introduced in the next session by the Hampstead, St. Pancras and Charing Cross Railway Company seeking powers to construct an underground railway from Hampstead to Charing Cross, the line of route following as nearly as possible the main thoroughfares between Charing Cross and the north-western suburb, viz. Tottenham Court Road, Hampstead Road, Camden Town and Haverstock Hill.

THE following recommendation has been adopted by a majority of the London County Council :—"That, subject to an estimate being submitted to it by the Finance Committee, as required by the statute, and to the Hackney district board entering into an agreement with the Council to contribute 10,000, or one-fifth of the cost, the Council do offer 50,000*l.* for Hackney Marsh, such sum to include the rights of commoners, the lord of the manor and all other owners, and that in the event of the Council agreeing to the expenditure the solicitor do make the offer on its behalf."

A POPULAR handbook to the Ruskin Museum at Sheffield has been prepared by the curator. It is not only descriptive of the chief objects exhibited, but explanatory of their meaning, of their place in the teachings of the museum and their bearing on the lessons which Mr. Ruskin designs the collection to impart. It is introduced by this motto from Mr. Ruskin's writings: "The right function of every museum is what is lovely in the life of nature and heroic in the life of men."

AT the Leeds Assizes, Messrs. R. Galsworthy & Sons, in an action against the Selby Drainage Commissioners to recover damages for the subsidence of a tan-yard at Selby through the negligence of the Commissioners in carrying out their drainage scheme, obtained judgment for 1,626*l.* The Court of Queen's Bench has now issued a mandamus commanding the Commissioners to levy a rate to satisfy the judgment, with costs, against the Commissioners. The Commissioners' case was that they had no powers to levy a rate for the purpose.

THE report of Mr. Wyatt, engineer, on the Craven Arms water supply has been accepted by the Ludlow Board of Guardians. Mr. Wyatt, in his report, said he had come to the conclusion that it was advisable that the Board should abandon the scheme which had lately been before them, and adopt a pumping scheme. His reasons for this were the high terms demanded for easement for one portion of the pipe line, the fickle nature of the supply necessitating large storage room, and the relative hardness of the water. The water pumped from the trial boring in Long Lane had considerably less than half the hardness of the springs at Denchope. He had made a boring, and water was met with at a distance of 20 feet. For the pumping power he should use a windmill. The total cost of the works he estimated at 1,900*l.* It was decided to discuss the question at the next meeting.

AT a meeting of the Hospitals Sub-Committee of the Leeds Corporation it was decided that steps should be taken to find a suitable site for an infectious diseases hospital, and that the committee should be empowered to visit other towns with a view of ascertaining the best form of hospital for infectious diseases existing in the country.

THE Wallasey Local Board have decided that the necessary steps should be taken to apply to the Local Government Board for a provisional order to sanction the borrowing of 50,000*l.* for new gasworks.

THE total cost of the improvement works proposed to be carried out by the Blackburn Town Council, and for which Parliamentary powers are to be applied for, is estimated at 250,000*l.*

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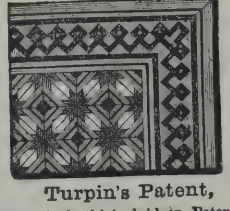
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AN inspection of Arbroath Railway Station has been made by engineers of the North British and Caledonian Companies, the companies interested in the station as owners of the Dundee and Arbroath Joint Line. It is understood that the engineers have recommended extensive alterations.

AMONG the Bills for the forthcoming session of Parliament will be one for the main drainage of Blackrock, a residential district in co. Dublin.

THE Bath Waterworks Committee recommend an increased water supply by purchasing springs known as Taylor Springs, at a cost of 18,000*l.*, with 400*l.* annually for pumping.

AT the inquiry held at Dudley into the proposal to borrow 5,000*l.* for public improvements, it was explained that 1,300*l.* was wanted for the Priory Street property, on which to build a fire-station ; 2,500*l.* for the Stone Street property, to widen the thoroughfare and provide increased market accommodation ; 926*l.* for a recreation-ground at the Buffery, and 300*l.* for one at Eve Hill.

THE Works Committee of the Aberdeen Harbour Board have agreed to protect the works at the Waterloo Quay wall by additional sheet piling, several parts of the wall having fallen. The estimated cost is 1,000*l.*

THE owner of the greater part of Prestatyn, Mr. H. D. Pochin, of Bodnant, intends to provide at his own cost a gas supply for the town, thus largely increasing its attractiveness both for residents and visitors. During the last year or two Mr. Pochin has built largely and laid out new streets, and it is understood that he has other improvements in view.

THE new tariff, which awaits the approval of the French Senate, will be prohibitive of English metals. On bar iron a duty of 2*l.* a ton, sheet iron 3*l.* 15*s.*; bolts, nuts, hinges, &c. 6*l.*; nails, 5*l.* 17*s.* 6*d.*, cast tubes, 4*l.*, lap-welded tubes, 7*l.* 10*s.*, hollow-ware, 12*l.* 10*s.* a ton, will be imposed.

AMONG the Parliamentary notices is one for forming a dock thirty acres in extent at Tranmere, on the Cheshire side of the Mersey. In addition to the dock, it is proposed by the London and North-Western and Great Western Companies, to build a river wall 5,000 feet long and a railway which will join the Birkenhead and Chester lines of the joint railways.

THE Christmas number of the *Ladies' Pictorial* this year, as in previous years, is delightfully printed, contains excellent illustrations, and most interesting reading matter. As in former cases, the proprietors seem to have spared no expense in the reproduction of their special plate, which is, if anything, even finer than their last year's, when they had probably the finest plate of any of the other illustrated papers.

On November 30, Mr. Gilbert Dalziel will publish *Judy* almanac for 1892, which will be fully illustrated by M. Greiffenhagen, William Parkinson, A. Chasemore, Alfred Bryan, Fred. Pegram, C. H. Marshall, H. R. Millar, J. B. Clark, Hal. Ludlow, E. G. Beach and W. F. Thomas. A specialty will be found in the extra four-page musical supplement, "Judy's Minuet," by Edward Solomon, composer of "The Nautch Girl," &c.

AMERICAN NOTES.

THE commissioners appointed to devise a scheme of rapid transit for New York city have recommended an underground system of railways in tunnels on each side of Manhattan Island, from the Yonkers line to the Battery, and a cross-town tunnel under Union Square. Express trains on special tracks to run forty miles an hour. Electricity to be the motive power and to light the tunnels. The block system to prevent accidents is proposed, and good ventilation, doing away with smoke, steam and discomfort, will be provided.

Stone of Indianapolis says :—Contracts for all the principal buildings for the World's Fair have been let and several of them are half completed. It has been ably managed, and the vast proportions of the work, the necessity for striking and artistic architectural effects and the enormous mass of detail involved have been so well considered that the whole reflects great credit upon all who have had the work in charge. The completed designs will prove, we think, that the United States' architects are peers to those of the world.

THE same paper says :—There is a decided and growing sentiment against the high-building craze that has been rampant in Chicago and other cities of late years, and in Chicago there is an effort to limit it by municipal law to eight storeys. So long as a certain number of office buildings are required on a limited area the venture will be safe so long as the demand be not greatly exceeded. But to build miles of such buildings will be to waste capital in a way that cannot be returned, and even if the craze is left unaffected by municipal enactment it will destroy itself by its own excess.

AT the meeting of the Engineers' Club of Cincinnati, Mr. A. O. Elzner read a paper on "The Engineer and Architect." He called attention, the *Engineering News* of New York says,

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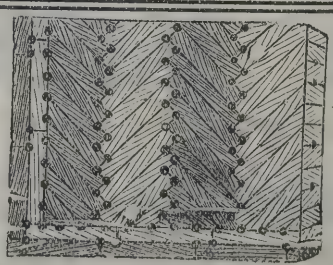
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to the intimate relations between the professions and the difficulty sometimes to know where to draw the line, and noted that many of the magnificent ancient works of so-called architecture certainly combined in their construction the ability of both the engineer and the architect. The professions must evidently depend upon each other for assistance in the carrying out of many of the large works of the present time, or else an architect must be an engineer, or an engineer combine the qualifications of the architect. This is illustrated in the fact that the Board of Architects of the World's Fair buildings at Chicago simply design and determine exteriors for the various buildings, while the work of preparing detailed plans, specifications, the necessary calculations and the construction are all in the hands of a separate engineer department. Many of the improvements and much of the economy in the construction of the present day are due to the assistance of each profession to the other. Incidental to the paper was a reference to and general description of the construction of the tall modern buildings of iron or steel framing encased in brick or terra-cotta.

THE marble tower of the Philadelphia City Hall, rising to a height of 337 feet 4½ inches above the pavement of the court-yard, is to be surmounted by a clock storey of iron, 67 feet 8 inches, and this by a pyramidal dome of aluminium, 105 feet 7 inches high, the whole capped by a bronze figure of William Penn, 37 feet tall. The iron clock storey is finished and set up on the grounds of the Tacony Iron and Metal Company at Tacony, Pa.

THE United States Department of Agriculture, through the Forestry Division, has commenced an investigation of the physical properties of American timbers as related to their conditions of growth and the uses to which they are put. The results, which should prove of value to engineers, architects, builders, and to the public generally, will be made public as fast as obtained.

THE *Builder and Woodworker* of New York says :—The characteristic English dwelling is described as a two-storey brick house, walled in and with the best part of the house at the back. There are the drawing and dining-rooms, while the kitchen and pantries are in front. In suburban and country houses the rooms are large and are arranged around a hall, but the windows and doors are small. The outside of the house is almost uniformly without architectural decorations, and the dulness of the climate is seen in the sombreness of the furniture and the adornments of the house. The interior is dull and uncheery. There is little "sweetness or light" in the colours, forms and expressions, except in the dwellings of more recent building and furnishing. Up to within a few years the inside finish was all of dark wood, and the furniture was mahogany of very heavy and ungainly construction. But if you can dissociate the idea of comfort from that of art, the English home has a very marked spirit of comfort.

OF high buildings in Chicago *Harper's Weekly* says the highest building at present (and one which is not built on the new Chicago construction system) is the Auditorim. Its loftiest point is 296 feet above the sidewalk. The Fair building, now almost completed in one section, measures 241 feet to the coping, and it is possible that it will be carried higher—to 16 or 18 storeys. The new Masonic Temple will measure over all 274 feet. This is constructed entirely on the new system. The Ashland block measures 210 feet to the coping; the Woman's Temple, whose topmost storeys are now being finished, 266 feet; the Manhattan, 198 feet; Monadnock, 194; Henning and Speed block, 192; Abstract building, 190; Chamber of Commerce block, 180: Home Insurance, 178; Tacoma, 175; Northern hotel, 174; Rookery, 164; Owings block, 161; Rand-McNally, 148; Chicago Opera House, 135; and the L.Z. Leiter building, 133 feet.

THE *American Engineer* of Chicago says :—The Department of Transportation is offered one of the most valuable relics of the early days of railroading in this country, and will doubtless secure it for an exhibit. The old locomotive "Samson," built in England in "the thirties" by the celebrated Timothy Hackworth, and brought to this country in 1838, is still in existence and in working order. Accompanying it is a quaint old passenger-car built in imitation of a stage coach, both standing on some of the old scolloped or fish-belly rails. The engineer who first ran the locomotive is still alive, and if still living at the time of the World's Fair may accompany the venerable engine.

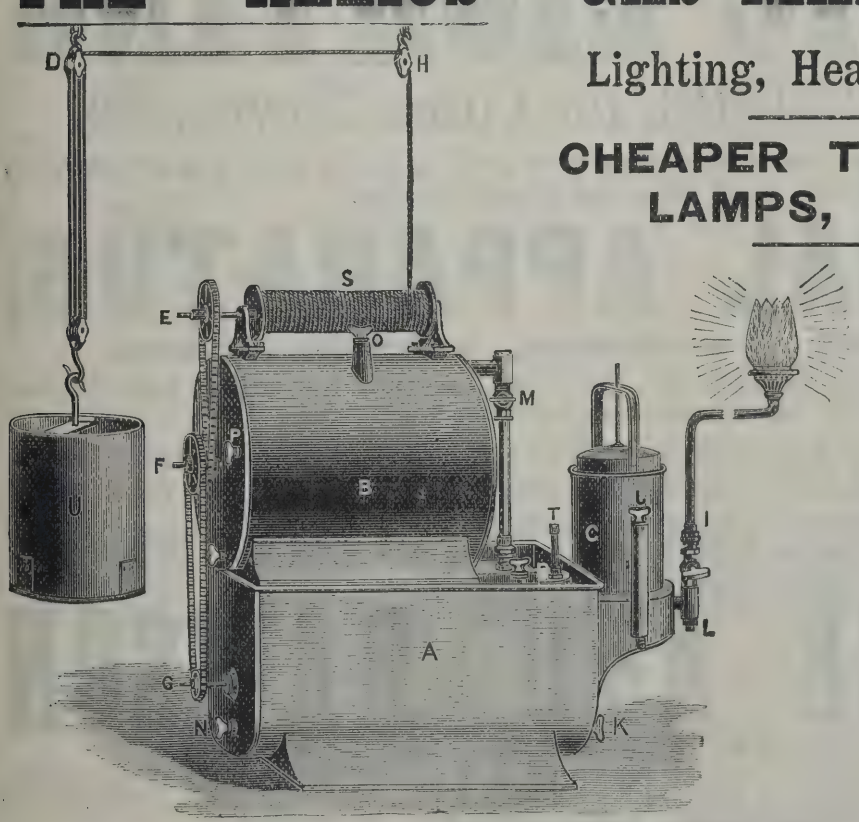
THE *Builder and Decorator*, Philadelphia, says :—A twenty-six storey building is now proposed for Lower Broadway, New York. It is to be constructed on the plan proposed and put in practice in Chicago in the past few years. The interior to be of steel framework, so that it would be strong and stand without walls, and resist any known wind pressure. It is supposed that it will cost 4,000,000 dols., and will be the tallest building in the world.

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THE Lake Hemet dam, the San Diego *Sun* says, will be 150 feet high and 200 feet thick at the base. It will be built of granite laid in Portland cement, is situated in the northern part of San Diego county, and will flood an area twice as great as that of the Sweetwater reservoir.

THE STAFFORDSHIRE INFIRMARY.

IT was proposed a couple of years ago to erect a new infirmary in Stafford with all modern improvements. The cost was calculated at 10,000*l.*, but an estimate being prepared by Mr. K. D. Young it was found that the building would amount to 13,000*l.*, exclusive of cost of site. But as sufficient money was not obtainable it was decided to remodel the present building. Accordingly a meeting has been held at which the following recommendation was submitted by the executive committee :—

(*a*) That the insufficiency of the funds available, coupled with the difficulty of obtaining suitable land, will render it impossible to re-erect the hospital on a new site. (*b*) That, as the only practical solution of the question, they recommend that the present site be utilised, and that as a commencement of what they hope may ultimately lead to an entire reconstruction on modern principles of the existing hospital, new wards, to accommodate twenty-eight patients, be at once erected on the vacant land to the north of the building. (*c*) That they have consulted an eminent architect, Mr. Aston Webb, of Queen Anne's Gate, Westminster, upon the subject, and have ascertained that the proposed new wards, erected on the most modern principles and with all suitable appliances, would cost from 3,600*l.* to 4,000*l.*

The following report by Mr. Aston Webb was read :—

"19 Queen Anne's Gate, Westminster, S.W. :
"October 21, 1891.

"My Lords and Gentlemen,—In accordance with your instructions I have inspected the present site and buildings and carefully considered the feasibility of a gradual rebuilding of your infirmary on the present site as funds will allow. I may say that I entirely concur with Mr. Gordon Smith as to the impracticability of satisfactorily remodelling the present building, but that I am of opinion that a gradual rebuilding could be carried out which would, when complete, provide practically a new infirmary in accordance with modern requirements and free from the defects pointed out by Mr. Gordon Smith in the present building. To make my proposals clearer I append to this report three sketch-plans:—No. 1, showing the building and site as at present ; No. 2, showing the blocks of new wards proposed to be first built ; No. 3, showing the entire building as proposed to be completed. I should recommend that two entirely new blocks of wards, containing twenty-eight beds in two floors in each block, be first erected at the north and south extremities of the present building, each ward having an aspect of east and west, and provided with all the necessary closets, lavatories and sinks at the one end and proper ward-kitchens, bathrooms, &c., at the other ; these offices being in all cases aërially separated from the wards, as the wards would themselves be from the centre block. These wards are shown on drawing No. 2, and it will be seen that they are within the limit of 80 feet from Foregate Street, within which Mr. Gordon Smith considers the present site 'fairly eligible.'

"When these blocks are erected fifty-six beds would be provided, free from the objections pointed out by Mr. Gordon Smith in the old building, and fitted with every modern requirement. If desired the A block could be built first, and subsequently the B block, and both could practically be erected without any disturbance to the patients until the wards were ready for their reception. When B block was built it would be necessary to pull down the present fever wards, which I understand are shortly to be vacated, and to erect mortuary and post-mortem rooms elsewhere, a site for which I have suggested at D on the plans. When these blocks are built, and until the funds permit of the scheme being completed, I should suggest that the present wards on the west front be closed. A portion of those on the east would be required for corridors, to connect the new wards to the present building, and the remaining portions would be available for day-rooms.

"I should also propose to divide the central ward on the first floor into cubicles, and bring the nurses down from their present very inadequate quarters on the second floor into them, or should it be deemed advisable to keep this as a ward, then some of the closed wards on the first floor could be used for the purpose. This would still leave the out-patients' department very badly provided for, and urgently requiring to be rebuilt, though it would no longer be under any of the wards. I should propose therefore that this be the next thing to be taken in hand, and might be erected on a site marked G on the plan No. 3, being connected by a corridor to the basement storey of block A, the present carpenter's shop and piggeries being removed.

"After this, the closed wards of the present building should

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be removed, and this would entail the removal of the present kitchens, which might then be accommodated on the top floor of the central block. New day-rooms, separation wards and ward staircases would be added adjoining the new ward kitchens, and connected by bridges to the central block, as shown on drawing No. 3. The central block would require a certain amount of remodelling, and the buildings would then be completed, as shown on the drawing No. 3.

"In accordance with your wish, I have not worked out the scheme in great detail; this would have to be done later; but I have done so sufficiently to satisfy myself of its feasibility, subject to such alterations in detail as would no doubt be suggested in conference with yourselves and the medical staff.

"In regard to the question of cost, I have gone into this as regards the new wards, shown on drawing No. 2 in considerable detail, and estimate that these blocks could each be erected for a sum of 3,600*l.* or 7,200*l.* the two (A and B) complete, with an addition of 300*l.* for the post-mortem and mortuary-rooms. With regard to the out-patients' department and the completion of the building, as shown on drawing No. 3, I have not the data for arriving at a close estimate, but it may be convenient if I say that I should approximately put the cost of the out-patients' department at 1,600*l.* and the addition of day-rooms, separation wards, remodelling the central block, at 4,000*l.*"

The Governors and subscribers have decided to adopt the report and recommendations of the Executive Committee, the expenditure being limited to 4,000*l.*

PILING ON FORESHORES.

AT the second ordinary meeting of the Liverpool Engineering Society Mr. John J. Potts read a paper entitled "Notes on Screwing Cast-iron and Driving Greenheart Piles at St. Anne's-on-Sea, Lancashire." These notes were taken during the reconstruction and completion of the jetty (of which the piles form a portion) for the landing of passengers from the excursion-steamers situate at the outshore end of the promenade-pier at St. Anne's-on-the Sea. Borings on the site showed that hard clay was reached after from 8 feet to 11 feet of compact sand and gravel had been sunk through. The screw-piles, which are all open hollow cast-iron tubes with screw blade at the bottom and 3 feet in diameter and 6 inches pitch, were screwed through the sand and gravel into the hard clay. A description was given of the gear employed and the precautions taken, it being tide work for getting both the upright and raking piles to the required depth, also particulars of the mode of working, the number of men necessary for each arrangement of the gear, the time spent in screwing, the rate of progress and the power developed in screwing the piles down. Owing to the nature of the foreshore it was arduous work screwing the piles in place, and the difficulty was increased where the capstan had to be reduced in diameter on account of the existing columns in the original structure being in the way. The piling-engine for driving the greenheart piles was of the usual construction, the tup being of cast-iron and weighing 19½ cwts. Particulars of the mode of working and of the behaviour of the piles during driving, with the precautions taken for preventing splitting, twisting, &c., the time occupied in driving and the number of men employed were also given. These piles being driven from above high-water level after once being pitched, it was not such tedious work as with the screw-piles.

FIRE INSURANCES.

IN the Edinburgh Court of Session last week an appeal was heard in an action brought by Andrew Gilmour, Blantyre, against the Caledonian Insurance Company, George Street, Edinburgh, for 1,700*l.* He insured shops and dwelling-houses with the company, and sustained loss to the amount sued for by fire. The company refused to pay more than 1,350*l.* They said that under the policy any dispute as to the amount of loss must be submitted to arbitration, and they maintained that the sum claimed was a gross over-statement of the value. On June 23 last Lord Stornmonth Darling repelled the defenders' pleas as to arbitration, and appointed the case to be put on the roll for further procedure. On a reclaiming note the First Division adhered to the Lord Ordinary's interlocutor, and the company sought for leave to appeal to the House of Lords from this interlocutory judgment.

After hearing counsel, the Lord President delivered judgment. His lordship stated that if he had only to consider the interests of the insurance company he would have been quite willing to grant leave, but much more had to be considered, viz. the interests of the pursuer, Mr. Gilmour. Counsel had stated that it was of great importance to the company for future guidance that they should have a judgment of the House of Lords; but while this might be true so far as the company was

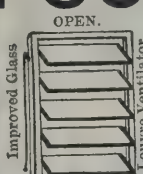
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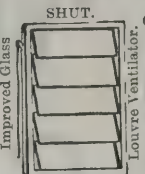


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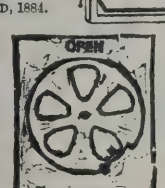
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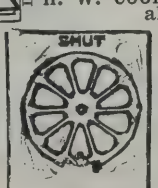
MEDAL AWARDED, 1876.

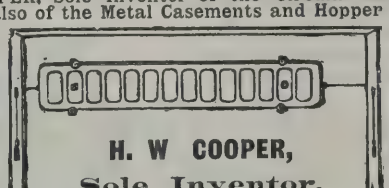


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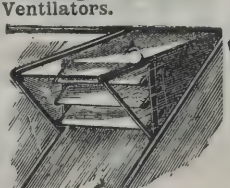


Circular Glass Revolving Ventilator.





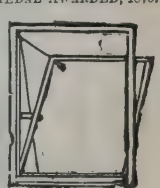
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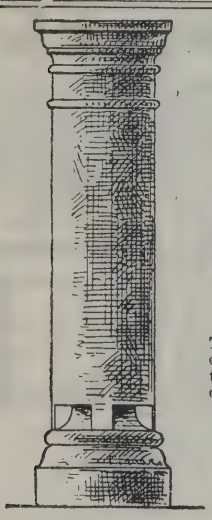
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concerned, the pursuer should not be made to suffer in any way for the purposes of testing the law as to the company's conditions of its policies. Therefore he was of opinion on this and other grounds that leave should not be granted. The other judges concurred.

As inconvenience has been caused in England by the working of the arbitration clause, a "Templar" calls attention to the subject in the *Times*. He says:—It will assuredly prove an unpleasant surprise to many to learn that the question whether policies are to afford us any protection or not does not in any way depend upon our fulfilling our part of the contract, viz. the payment of the annual premiums, but simply and absolutely upon the extent to which the particular insurance company may choose to take advantage of the "arbitration clause." I can give a pointed illustration of this in the facts of a case which came directly under my knowledge a few years ago. A small tradesman had insured his stock for some 700*l*., and when this had been wholly destroyed by fire, he made his claim in due course on one of the oldest and best-known of our great insurance companies. He was immediately met by the "arbitration clause" being set up, which, let it be remembered, in this as in all other cases provides that the company shall not be bound in respect of any claim unless and until the amount of the liability, if not admitted, shall have been referred to arbitration, and that an award shall be a condition precedent to any right of action to enforce a claim at law. The unhappy small tradesman was thus driven to arbitration, and in the result an award was made assessing his loss at some 600*l*. The company had done all in its power to pile up the costs of the arbitration, and the tradesman, having had to pay his own costs, was at this point between 400*l*. and 500*l*. out of pocket. This was bad enough, but he did not realise the true character of his position until, having made his claim upon the company for his 600*l*., he was coolly informed that he would then not receive a halfpenny, but that he could proceed, if he chose to do so, to bring his action to enforce such claim. He of course then learnt that the arbitration had merely decided that if he could bring his action and succeed in it he might, at the end of protracted litigation, be entitled to his 600*l*. The sequel, which could easily have been, and probably in fact was, anticipated by the insurance company, was simply that the unhappy small tradesman, having exhausted the whole of his means over the arbitration, could find no money for litigation, and so failed to recover a farthing under his policy. Now, sir, I venture to assert that such a condition of affairs as both can be and is maintained by the "arbitration clause" in our policies ought not to be possible, and further that it would be easy enough for the public to force the insurance companies to put an end to it. I contend that the clause ought either to be expunged from all policies or so altered as to make the awards under its terms final not only as to the amount to be recovered by the assured, but also as to the liability of the insurance companies, and, what is absolutely necessary too, carry costs. Let it not be supposed that, because we hear very little in our Courts of cases in which insurance companies have made an unscrupulous use of their terrible powers under the "arbitration clause," such cases are rare. The fact is that there seems practically nothing at which the insurance offices will stick to escape their liabilities. A curious instance of this was brought to my knowledge some little time back. A fire having taken place in a factory in London, the assessor tried the usual trick of offering to pay a portion of the claim made by the assured. Finding he had a wealthy firm to deal with, and that the case was one of the rare ones in which the assured could not be forced to accept that which the insurance office chose to offer, he set to work to fight every item tooth and nail. Will it be believed that one of such items which the insurance office refused to pay was the very moderate value placed upon an ordinary clock on the ground that it was "no part of the plant?" And this, too, when the assured was liable under the provisions of the Factory Acts to a heavy fine if he failed to have a clock on his premises.

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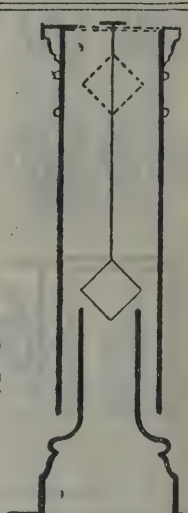
THE third ordinary general meeting of this company has just been held at the Cannon Street Hotel. Sir Rawson W. Rawson, K.C.M.G., C.B., the chairman, who presided, in the course of his address said:—Considering the extraordinary financial crisis that has occurred during the two years of our existence and the general commercial depression which ensued, we trust you will think the results of the operations of the company eminently satisfactory. Turning to the balance-sheet and looking to the profit and loss account, you will find, deducting from both sides of the account the amount of 16,000*l*. brought forward from the previous year, that the total earnings of the company amounted to 89,000*l*. Out of that we have provided for all our current expenses; we have provided for writing off what we consider a sufficient amount in the reduction of the value of our patents. We have paid



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the interest due upon our debentures, and we have written off 10,500*l.* of extraordinary expenses, some of which might fairly have been distributed over a further term of years. Then we leave a balance of 35,000*l.* to meet our dividends. The dividend which we promised, and were certainly pledged to, was 15 per cent. on our ordinary shares and 8 per cent. on our preference shares, and those dividends amount to 30,500*l.* Consequently we have a surplus of 4,600*l.* applicable to such purposes as may be thought fit. If we add to that the 10,000*l.* of extraordinary expenditure, our earnings during the year were 35,000*l.* above our current expenses, and that without trenching upon the 16,000*l.* carried forward from the previous year. Now, gentlemen, the directors hold, and we trust that you will hold, that in such an extraordinary year as that through which we have passed the result is satisfactory. It was a year, remember, affecting peculiarly this company, because one of the branches of the business of this company is to fully test new inventions, to utilise all the patents which it possesses, and to interest the public in new inventions connected chiefly with electricity. Well, this has been a year in which the public have not been disposed to enter into new undertakings, and consequently we have had very little encouragement. There is not much to notice on the debit side of the balance-sheet. We have reduced the mortgage on freehold property by 3,000*l.* The sundry creditors stand at 8,000*l.* less, and we have swept away the whole of the guarantee fund of 75,000*l.* We have refunded that to Woodhouse & Rawson, Limited, according to the authority which you gave us at the previous meeting, and therefore that disappears from our balance-sheet. You will find entered for the first time a reserve fund of 25,000*l.*, and our employes' pension fund of 1,065*l.* Turning to the credit side, there is an increase in freehold premises of 12,000*l.*, which is caused by the building and improved engine power erected at Cadby Hall, and also sundry improvements in the Kidsgrove property, which was taken over at the commencement of the year, and necessitated certain outlay. There is a small item of increase in regard to the leasehold premises. The next three items are heavy ones, viz. plant, stock, and expenditure on contracts. These are increased, but the explanation is very simple. The United Company has acquired new works, having made a new organisation, and having extended its business, I may say, throughout the world. Necessarily we had to make a large outlay on our works for plant, on our supply stations for stock, and on our installation and contract works for the work in progress. In fact, what did we ask money for but to extend our business? and the explanation of these increased items is simply that we have extended our operations. With regard to the report, I am able to speak of the very great improvement that has been made at the West Kensington Works by the erection of a new block of buildings there and a new engine-house, which will enable us to undertake a class of business likely to prove highly profitable. One of the great sources of our credit and profit is our manufacture of specialties. This new block will enable us to undertake on a large scale the manufacture of mechanical apparatus as well. With regard to the Kidsgrove Works, we only entered into possession at the commencement of the year. It was a business that required considerable improvements in many ways, and we had to carry out, at a disadvantage in many respects, the works begun by the previous owners. The object of acquiring the Union Foundry was this: we possessed the means of making all electrical apparatus of a small character, but we had no works in which we could on a large scale manufacture dynamos and engines peculiar to electrical apparatus, and to introduce new inventions—specialties, I call them—such as are noticed in the report—hydraulic engines, electric cranes, and things of that kind. With regard to the supply department, that is going on satisfactorily. A very important matter is with regard to the Epstein accumulator. We have had the Epstein accumulator under observation and testing for two years, and the result is as satisfactory as we could possibly desire.

THE ARBITRATION CLAUSE.

ON Monday in the Queen's Bench Division, before Lord Coleridge and Mr. Justice Wright, the case Eyre *v.* the Corporation of Leicester was heard. This case raised a question of some importance as to the effect of the "arbitration clause," which is now so common in all contracts of any importance, that "disputes and differences shall be referred to arbitration," and especially as to the effect of the Arbitration Act, 1889, with reference to the power of the Court to appoint an arbitrator—if the parties cannot agree upon one—in order to carry out an arbitration clause in a contract. The Act (sec. 5) provides that where there is a provision in a contract for reference of differences to an arbitrator, and the parties do not, after differences have arisen, concur in the appointment, either party may give written notice to appoint an arbitrator, and if it is not done after seven clear days, then the Court or a judge may appoint

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an arbitrator, &c. In this matter Mr. Eyre, the plaintiff, a contractor, had been employed by the Corporation of Leicester to construct a main sewer, &c., and the contract (October 1888) contained a clause which provided that the contract should be carried out according to certain general conditions (one of which was for reference of disputes to arbitration), and "the submission hereby made and the award made by the arbitrator or umpire to be appointed in accordance with the condition for reference to arbitration," which was in these terms: — "That every dispute, question, difference or controversy arising between the borough surveyor and the contractor (except as to matters or things left to the sole decision of the borough surveyor under these conditions) shall, after the completion and delivery of the work, and after the final certificate by the borough surveyor, be referred to arbitration pursuant to the provisions of the Common Law Procedure Act, 1854, or any Act or Acts amending the same." The contract, it will be seen, was before the Arbitration Act, 1889, but the Court of Appeal have held that the Act applies to existing arbitrations. When the work was completed the contractor made certain claims for sums beyond the amount in the contract, amounting to between 7,000*l.* and 8,000*l.*, of which 1,277*l.* was for extras and the rest for damages for alleged injury to the works by bad water-pipes, &c., and a claim of 1,165*l.* for damage caused by insufficiency of sewers to carry off waste water, to which there was a counterclaim of about 500*l.*, and in April last his solicitors wrote to the solicitors for the Corporation, that he was as of right entitled to arbitration, and calling upon them to appoint an arbitrator. They, however, denied that he was so entitled, and in July he sent to them a notice "to concur with him in the appointment of a sole arbitrator to act in the above-mentioned matter for the purposes of the submission to arbitration under the agreement, and that in default he would be entitled after seven clear days to proceed under the Arbitration Act. They, however, still refused to comply, and then the contractor applied to a Master for an order under the Act, and he declined to make it, saying that the notice was not according to the Act, and the Judge at Chambers (Baron Pollock) concurred in this view, and declined to make any order. The contractor now appealed against that decision.

On behalf of the contractor in support of the appeal, it was urged that the case was clearly a case for reference to arbitration under the arbitration clause, and that the power of the Court to appoint an arbitrator applied under the notice, and that it was a valid notice to appoint a single arbitrator.

On the part of the Corporation, it was contended that there was nothing to indicate that there was to be a single arbitrator, and that the allusion to an umpire indicated that there were to be two at least. Each party obviously was to appoint an arbitrator, and how, then, could the Corporation "concur in the appointment of a sole arbitrator," especially as he was not named? No doubt the case must be referred, but it was not a case for a reference under the contract, but it was a case for an action, to be referred to an official referee, who could raise any question of law and report to the Court on the case. [Lord Coleridge: So there is to be the action, with all its expense, first, and after all it must be referred to arbitration. That seems strange.] Some of these heads of claim are not fit for arbitration at all, and may raise questions of law not fit to be dealt with by a lay arbitrator. Moreover, some of them do not come within the arbitration clause.

Their lordships, having conferred, came to the conclusion that the order ought to be made.

Lord Coleridge, in giving judgment, said he assumed that the arbitration clause was a sufficient submission of future differences, as he thought it clearly was so. Then, as to the effect of the enactment in the Act, he thought that the terms "arbitrator" and "umpire" were used as synonymous. No doubt ordinarily "umpire" meant as between two arbitrators, but not necessarily so, and where there was to be a single arbitrator it excluded an umpire in that sense, and the two words were synonymous. Then there was to be a reference to a single arbitrator, and by the contract, where differences had arisen, they were to be referred to an arbitrator. Now, in this case differences had arisen, and upon application to them to do so the Corporation had not in any sense concurred in the appointment of an arbitrator, as they disputed that it was a case for arbitration at all. In such a case the statute said that either party might give the other notice "to appoint an arbitrator," and if such notice was given and an arbitrator was not appointed in seven days then the Court might appoint one. The letter of the contractor previous to the formal written notice might be taken into consideration, and it ran thus, that he understood the Corporation to dispute that it was a case for arbitration at all, but that if they were prepared to concur in an appointment, then he would submit names to them; and they would not concur in any appointment. That clearly made a case in which the Court had power to interfere and appoint an arbitrator. The Master would, of course, hear the parties on the question of arbitration, and also as to the fitness of any

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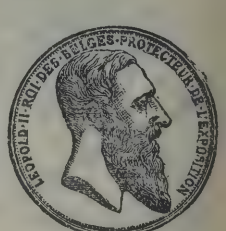
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persons proposed. But the Court could refer the matter to him, and ultimately determine as to both questions. The Court would, therefore, send the matter back to the Master for that purpose, otherwise one of the parties might, by refusing to concur in the appointment of the fittest possible person as arbitrator, defeat the arbitration clause altogether. The appeal, therefore, must be allowed, and the matter go back to the Master.

Mr. Justice Wright concurred, observing that the Corporation could easily ask the Master to appoint a legal arbitrator, and he could easily, if he thought proper, state a case on any point of law. Ordered accordingly. Time to appeal refused.

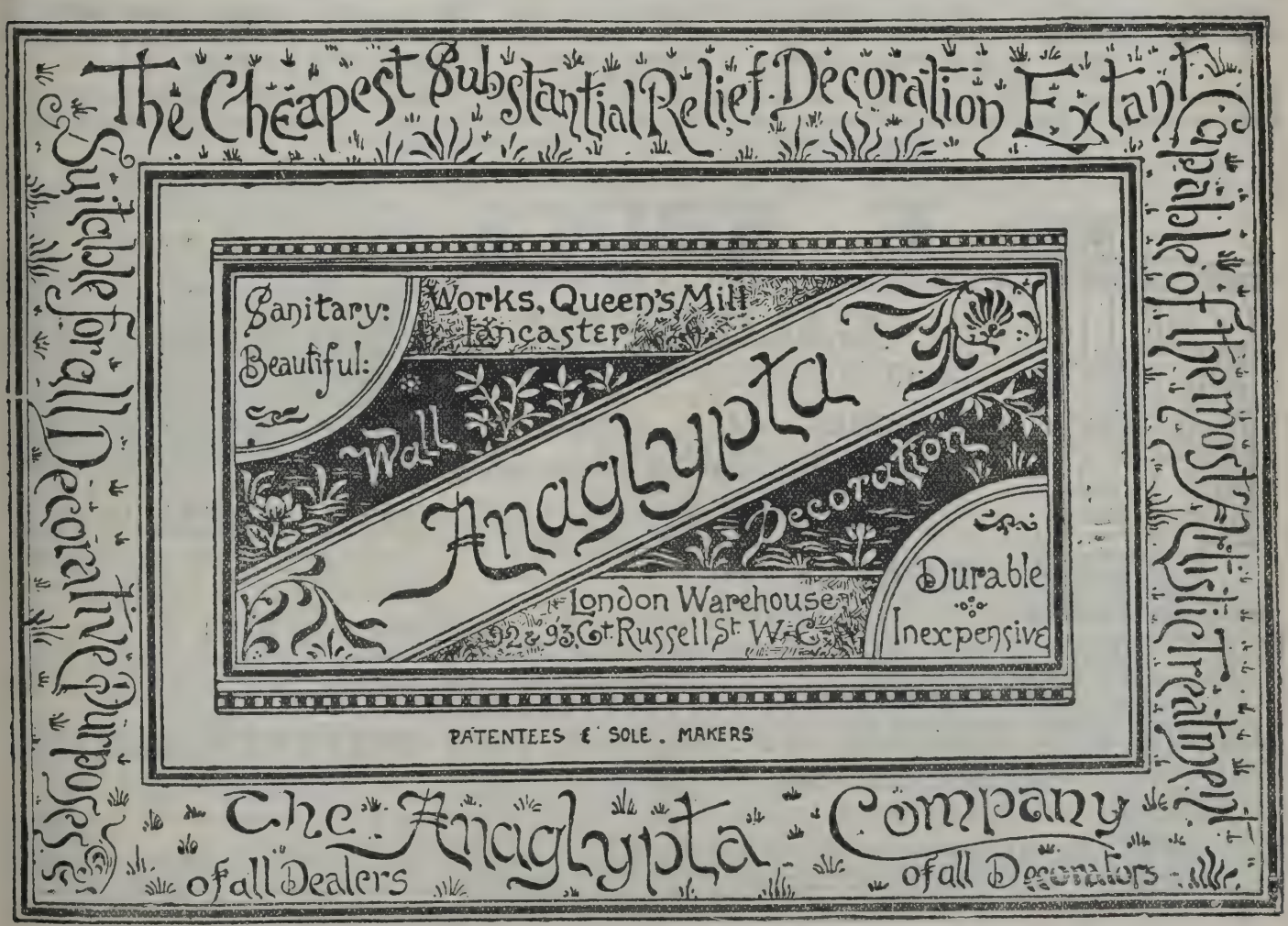
NEW CATALOGUES.

A NEW list has just been issued by Messrs. Robey & Co., of the Globe Works, Lincoln, of the patent "Robey" gas-engine (Richardson & Norris's patent) manufactured by Messrs. Robey & Co. Economy, safety and power are among the leading features of the "Robey" gas-engines. Important improvements have been made in these gas-engines. The principles of construction are as follow:—The firing-slide, which is the cause of so much trouble in other gas-engines, is entirely dispensed with. The valves are of the simplest possible form, and, having but a very slight vertical movement, their wear and tear is reduced to a minimum. No naked light is used; hence there is no risk of the engines stopping through such being accidentally extinguished. There are no stuffing-boxes to pack, no joints to break, or water-jacket to drain when the piston has to be removed for cleaning. The driving-shaft of valve-gear can be taken out without disconnecting a single cam, lever or pin. The engine is so simple that the whole of the parts can be taken to pieces and put together again by any ordinary intelligent labourer without difficulty. The above-named great advantages are possessed by no other gas-engine in the market, and they are of special importance when engines are fixed in situations or in countries where skilled labour is not readily obtainable. Another important improvement is the method of regulating the speed. This method is not only much simplified, but is also thoroughly reliable, so that an engine fitted with Robey & Co.'s patent governor will work with the same slight percentage of variation that their high-class steam-engines do, and thus are well suited for driving dynamos and other machinery direct. A further advantage of Robey & Co.'s governing arrangements is also important. The speed can be readily adjusted to either a low or high velocity, so that the same engine can be set to run slowly during the day for pumping or other purposes, and then adjusted at night to run at a high speed for electric-lighting. The lubrication is excellent, a patent apparatus measuring the lubricant out and feeding it drop by drop when required with perfect uniformity, and automatically ceasing to feed when the engine stops. All the engines are fitted with an improved safety combination, to prevent them starting backward; their working parts are reduced to a minimum, and all the wearing parts have special large surfaces. The whole of the materials and workmanship are of the highest class. With Robey & Co.'s patent regulator the consumption of gas is in strict accordance with the work done, and ceases immediately the engine is stopped. The engines are silent also in working. The list illustrates types A, B, C and D of the "Robey" gas-engines. Type D is especially arranged for electric-lighting; C, for driving pumping machinery, &c.; A, for driving high-speed machinery, &c.; B also is a high-speed engine, and, moreover, meant for electric-light work. Messrs. Robey & Co.'s name is so well known as patentees of high-class steam-engines that this should be a guarantee that any goods manufactured by them would be of the best material and workmanship.

THE HOLBORN EXTENSION.

THE Holborn Extension Committee, which has been formed for the promotion of a new street to the Strand through Lincoln's Inn Fields, and which has offices at 90 Southampton Row, has prepared the following petition of inhabitants of the Holborn division of Finsbury and adjacent districts to the London County Council, which is now in course of signature:—

We, the undersigned ratepayers and inhabitants, desire to impress upon you the great necessity of improved communication between Holborn and the Strand. The new street from Southampton Row, which has already been under the consideration of the Council, should no longer be delayed. It is now nearly twenty years since this improvement was mooted, and its necessity has been growing from day to day. Several lines of omnibuses run from Euston, King's Cross and St. Pancras Stations to Victoria, Charing Cross and Waterloo Stations, crossing Holborn; these, with other vehicles, create



almost constant serious blockages. The new Law Courts have also brought considerable increase in the traffic, and great inconvenience is found in getting to the Strand from districts north of Holborn. The bars and gates also which have blocked the way from Camden Town through the division are now taken away, and this has considerably increased the demand for direct communication. We are, therefore, strongly of opinion that this question should not be longer delayed. Many serious accidents have already occurred, and the loss of time caused by the continual blockages at the corners of Southampton Row and Little Queen Street, and also in Holborn, is a very serious matter to the general public. For these and other reasons we urge that immediate attention should be given to this important measure. The route we suggest would commence at Vernon Place, Bloomsbury, and take a course through Kingsgate Street, crossing Holborn, and thence through New Turnstile into Lincoln's Inn Fields, and west of the Law Courts into the Strand, thus opening up the shortest possible thoroughfare through a line of squares and open spaces from the north to the south of London. The recoupment of this route would be so great as to obviate the necessity of the betterment principle being adopted or required, and if economically carried out the cost would not burden the rates to any appreciable extent. At least one-third of the proposed route, namely, the west side of Lincoln's Inn Fields, is already a wide thoroughfare on which no expense need be incurred, and the greater portion of the property which would have to be taken through the whole route is old and dilapidated and of comparatively small value. Your Improvements Committee, having had before it the route *viâ* Little Queen Street, it is necessary to consider if the route we propose would not be both better, but also less expensive, and one that would give greater facilities for relieving the traffic in Holborn and the Strand, and direct access to the Thames Embankment. We respectfully assert, were Lincoln's Inn Fields route carried out, with a spur street starting from the north-east corner of Clare Market in a south-westerly direction to the Strand and Waterloo Bridge, that every facility would be given to persons going both south-east and south-west, and the Council would not only be opening up a communication between the northern and southern railways, but at the same time making one of the greatest improvements ever carried out in the metropolis. One of the principal advantages of this proposed route will be that it will open up an entirely new road from north to south, leaving the existing thoroughfares undisturbed and greatly relieved of traffic.

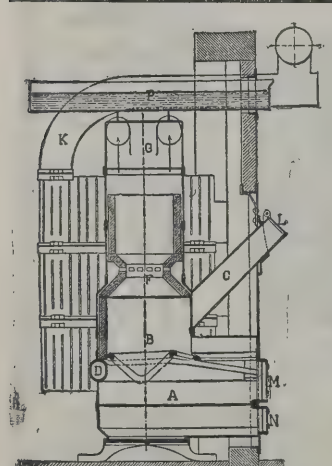
THE LATE J. E. SMITH.

AN inquiry has been held by Dr. Thomas Jackson, the borough coroner, at 8 Broad Green Avenue, Croydon, into the circumstances attending the death of John Edward Smith, aged sixty-seven years, a retired builder, lately residing at the above address. According to the evidence of the widow it appeared that some time since the deceased had a paralytic seizure which made him very peculiar, and he afterwards suffered from religious mania. He had a building erected at the bottom of his garden in which to study religion, and he recently told witness that he had received a message from Heaven to the effect that they would both live to eighty years of age, and that he would become a great preacher. He went out, and returned looking very unwell. Afterwards he complained of faintness, and before witness could procure him some brandy and milk, which he asked for, he died. Dr. G. Fleming stated than when he met the deceased six months ago he expressed his surprise at seeing him walking without sticks. The deceased replied that he had received a message from Heaven telling him to throw them away, and he had not wanted them since. The cause of death was syncope from heart disease. The jury returned a verdict accordingly.

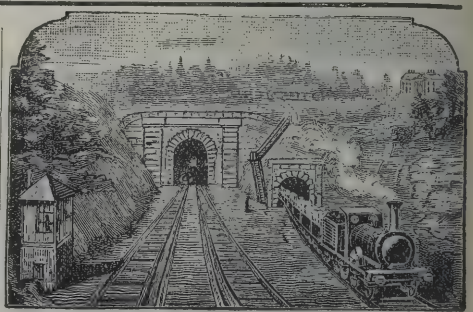
THE LONDON WATER SUPPLY.

A MEMORANDUM on the water supply of the Metropolis has been prepared by Alfred H. Haggis, Deputy Chairman of the County Council. In the course of it he says:—"In looking forward to the future wants of London and surrounding districts, we may fairly anticipate that the increase of population and consequent demand for water during the next two decades will be at least in equal ratio to the growth of the past twenty years; the probabilities are as to the latter that it will be larger. But I will suppose that the consumption between 1890 and 1910 will increase in the same ratio as from 1870 to 1890, which was nearly 70 per cent. In that case the daily average quantity required in 1910 would be 295 million gallons, an advance of 120 million per day over 1890. Even if the same quantity only was added in the twenty years as in the previous period it would amount to 71 million, or a total of 246 million gallons average per day, to which must be added 10 per cent. for the maximum months. How is this vast quantity to be obtained from

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.
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157 STRAND, W.C. (Four Doors from Somerset House) LONDON.

the present sources? The Thames supply has already nearly reached its limit; the maximum allowed to be taken is fixed at 130 million gallons. At the present rate of progress this will be attained in less than five years; it cannot be delayed much longer, even if the ratio of increase be reduced; and yet five out of the eight companies are practically dependent upon this river for their supplies. From the facts supplied by Mr. Binnie, it is evident that the river Lea is already taxed to its full capacity, so that no appreciable assistance can be obtained from it in raising the required quantity, and the supply taken from the springs and wells in the Lea valley during the last three or four years has been augmented 50 per cent., and the increase is still going on. Although the Kent wells may be able to yield an increase on the present supply, yet a great strain has been put upon their resources during recent years; in the comparison between this and last year's supply from the various sources, I showed that the largest increase was from the Kent district, amounting to no less than 12 per cent. in the one year. To sum up, from the Thames there is a margin of 25 million gallons between 105 millions, the maximum already abstracted, and the authorised maximum of 130 millions, whilst from the Lea no additional supply can be obtained, so that the underground water is the only present source available for procuring the remainder of the large quantity estimated to be required by or before the year 1910. It is improbable that the intake from the Thames will be allowed to be enlarged, as the resources of the river will be strained to the utmost to provide the 130 million gallons, and even if there should be sufficient supplies of underground water to make up the deficiency, which is very doubtful, the prejudicial effect upon the wells and streams of the districts of such an enormous abstraction would be so serious that public opinion would probably prevent its being taken. The necessity, therefore, for the provision of a new or supplemental supply on the ground of insufficiency alone, altogether irrespective of the question of purity, would appear to be paramount and urgent. From the statistics I have given it is evident we shall within a few years arrive at a crisis in connection with the water supply of London. Already there is a barely sufficient reserve for the interval that is required for the preparation and carrying out of a scheme for a new supply. I offer no opinion here as to whether it is possible for the supply to be obtained by the construction of storage reservoirs in the watersheds of the present rivers, or whether it will be necessary to secure it from an altogether new source, although all the evidence laid before the Council points to the impracticability of the former course; but in any case a large outlay of capital will be at once required, and this impending and onerous liability must, in the event of purchase by the Council, be taken into account in estimating the value of the Companies' undertakings."

NEW FLOUR MILLS FOR EDINBURGH.

NEW roller flour mills are about to be erected at Chancelot, Ferry Road, Edinburgh, by the Scottish Co-operative Wholesale Society, Limited. Railway sidings will be formed to the mills and warehouse buildings. The whole of the machinery will be of the latest improved type, the flour milling plant being on the roller principle of the most modern description. The plant will have a capacity of manufacturing from 25 to 30 sacks of flour per hour, or between 3,500 and 4,000 per week. On delivery the wheat is to be conveyed into a self-registering automatic weighing-machine, and thence led into separators for the purpose of having the larger impurities removed from the grain. The wheat will next be conveyed into silos with hopper bottoms, having a storage capacity of 21,500 quarters. The main buildings will face Dalmeny Road, having a frontage of 372 feet, and will consist of (1) roller flour mill, 103 feet in height and six storeys high; (2) a large engine-house and electric lighting machinery room, with three wheat-cleaning floors; (3) tower containing wheat pit, millmasters' and sample rooms, continuation portion of wheat-cleaning floors, and a large water-tank; (4) range of silos; and (5) sack-cleaning, repairing and storage lofts. The buildings to the rear are to consist of a warehouse with a storage capacity of 48,000 sacks of flour, the mechanics' shops, a boiler-house, and a chimney-stack 215 feet high. Fronting Dalmeny Road will be the counting-house and a house for resident employés. From the main building a tower will rise to a height of 150 feet with a clock having faces towards four sides. The tower is to contain the above-mentioned tank, which will have a capacity of 75,000 gallons of water for supplying an installation of sprinklers. Throughout the buildings there will be fitted up 2,500 sprinkler-heads connected with about four miles of piping. The sprinkler-heads will be so constructed that, on the temperature rising to 150 deg., water will be discharged, the risk of fire being thus reduced to a minimum. The valves in connection with the sprinklers will be so arranged that, in the event of fire breaking

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out, gong alarms indicating the locality will be sounded. Other precautions for the prevention and extinguishing of fire are to be adopted, including steam fire-pumps. The building will be fitted up throughout with electric light. An electric-bell system will also be introduced with the view of communicating between the various parts of the buildings and the engine-room. From the above outline of the mill and buildings there seems to be no doubt that when they are completed and in working order they will be found to be well appointed for the economical manufacture of superior flour. The roller flour milling and other machinery will be erected by Mr. Henry Simon, of Manchester. Mr. James Simpson, Leith, is the architect for the buildings, and the work so far as possible is to be carried out by the society's employés.

THE SANITARY INSTITUTE.

AT the last meeting of the Council the following subjects were decided upon for discussion during the coming session:—"Recent Practice in the Ventilation of Sewers," "Refuse Disposal," and "Working-Class Dwellings." Arrangements have been made for holding a course of lectures for sanitary officers with the County Council of Derby, to be followed by an examination, and similar arrangements are in progress in other centres. Dr. Francis Vacher, M.O.H. for Birkenhead, was elected Fellow, and fifteen members and twenty-eight associates were elected, and a number of applications read for election at next meeting.

REGISTRATION OF PLUMBERS.

THE Mayor of Newcastle-on-Tyne presided over a public meeting held in the Cambridge Hall, Newcastle, in connection with the North of England District Council for the National Registration of Plumbers. Among those present were Alderman Head, Dr. Garnett (Durham College), Dr. V. Rutherford, Councillor Armour and the clerk of the Plumbers' Company, London. Alderman Head, Stockton-on-Tees, remarked on the need for promoting sanitary improvements. The Chairman said no more important subject could enlist the attention of the community, and more especially those responsible for the health of the community, than that which they were there to discuss. They all knew that the plumber's path was different from others. There was so much to do under the boards, under the plaster and underground that really in order to have a good job upon a house they required to have a conscientious man, and experience, skill and adaptation for the work. There was temptation to put as little money underground as possible and to put as much into the front garden as possible in order to sell the house. The temptation was strong. What was the result? Was not the result that their death-rate throughout all their large communities was much larger than it should be? The diseases which come direct from the drains entered their houses with an expense for medical attendance which far outweighed any expense the builder might have put upon the plumbing work. The following resolutions were passed:—"That this meeting memorialise the local authorities to consider the operation of the Technical Education Acts in the counties of Northumberland, Durham, Cumberland, Westmoreland and the North Riding of Yorkshire with reference to technical education of plumbers." "That this meeting, having considered the terms of the resolution passed at the recent Congress of Hygiene on the proposal to organise the training and registration of plumbers, adopt the same and instruct the secretary to send a copy of the resolution to the Members of Parliament of the district and to the President of the Local Board." The meeting concluded with a vote of thanks to the mayor.

Dr. Garnett, Principal of the Durham College of Science, recently delivered a lecture on the subject of "Plumbing and Domestic Sanitation" at a public meeting held in Berwick-on-Tweed under the auspices of the County Council of Northumberland. County Councillor Captain Forbes, R.N., presided, and there was a large attendance, including the Mayor of Berwick, Alderman A. Darling, Mr. Charles Williams, organising secretary of the Technical Education Committee of the County Council, the clerk of the Worshipful Company of Plumbers, &c. Dr. Garnett said that the County Council of Northumberland had taken a high-minded view of its responsibilities in regard to the grant made to it by the Chancellor of the Exchequer, and had resolved to devote the whole sum for the purposes of technical education. Technical education had been defined as instruction in the scientific principles which underlay our trades and handicrafts. He (the lecturer) supposed there was no subject of greater importance than plumbing and domestic sanitation, inasmuch as the life and health of the community depended more perhaps on the study of domestic sanitation than upon any other science, trade, or

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handicraft. When the plumber visited a house, assisted by an apprentice only, he performed his own diagnosis of anything that had gone wrong with the sanitation of the house. Then he specified and applied his own remedy. After he had done the work, it was almost impossible to have it efficiently inspected. Thus they trusted their health and property to the plumber. If they placed their property in the hands of a solicitor, the law required that that solicitor should have served so long in the office of a solicitor, and that he should have passed a prescribed examination, and have been registered, while, if he misconducted himself, his name could be struck off the roll. They trusted their lives to an apothecary or a doctor, but the law required that both should have shown their qualification. But in the case of the plumber they had hitherto trusted him with both their health and their property, and had taken his efficiency for granted. It was only when they realised that they entrusted the plumber with interests as great as those which they entrusted to either the physician or the apothecary, that they could appreciate the true value of the plumber, and the necessity for his being properly trained and registered. An interesting discussion followed the lecture, and the meeting terminated with votes of thanks to the lecturer and chairman.

The Mayor of Liverpool, speaking at a public meeting in Liverpool the other day, said the plumbers were an important body, and were as useful in their way for the prevention of disease as doctors were in curing it. He did not wish to take their living from the doctors, but he wished to see the health of Liverpool improved as much as possible, and he thought the best way to do it was to improve the education and scientific skill of the plumbers. Dr. Stopford Taylor, medical officer of health, said a system had been devised, under the title of the National Registration of Plumbers, by the Worshipful Company of Plumbers, by which none but competent plumbers would be registered. There were very strict and searching examinations into the qualifications of applicants, and none but practical and sound workmen were admitted. Since the Registration Committee had been established in Liverpool, 318 applications had been received, and 260 had received certificates of competency. Examinations had also been held of the students in the plumbing classes, and some of the papers sent in by the applicants were so excellent that the Worshipful Company of Plumbers granted prizes and certificates. The Mayor distributed the prizes to the following :—For practical work, J. Bellis and H. Moonsy ; for papers on drains and soil pipes, J. J. Lyons ; for sanitary arrangement of town house, J. Bellis ; for sketch of valve closet, C. Young ; for paper on solders, &c., C. W. Dyke. Certificates were given to D. Cowden, F. R. Bioletti and C. Young for papers on solders, &c. Amongst those present at the meeting were Messrs. W. F. Lawrence, M.P.; C. S. Pain, C.E.; W. Hall, C.E., secretary of the Registration Committee ; Dr. Steeves; Dr. Vachar ; Mr. Edmund Kirby, F.R.I.B.A.; Mr. Joseph Rhodey, president of the Liverpool Lodge of Operative Plumbers; Mr. John Taylor, secretary of the Benevolent Fund; Mr. Levi, chairman of the Liverpool Lodge; Mr. H. Henshaw, A. Bucknell.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

18884. Frederick Cooke, for "An improved combination dustbin and cinder-sifter."

18910. John Read Anderson, for "Improvements in and relating to drain-traps."

18927. Thos. Troward Knell, for "A new fastening for door knobs and handles."

18983. Wm. Henry Astell and James Lostevin, for "Improvements in sash-fasteners."

19023. George Henry Couch, for "Improvements in window-sashes and frames, and fittings therefor."

19106. Daniel Ward, for "Making coloured stucco, coloured concrete blocks and tiles."

19217. Annie Coats, for "Improvements in the rollers of blinds and the like."

19220. Richard Miles, for "A new or improved lock."

19264. Thomas Poyser, for "Improvements in wood screws."

19265. William Brenton, for "Improvements in safety bolts."

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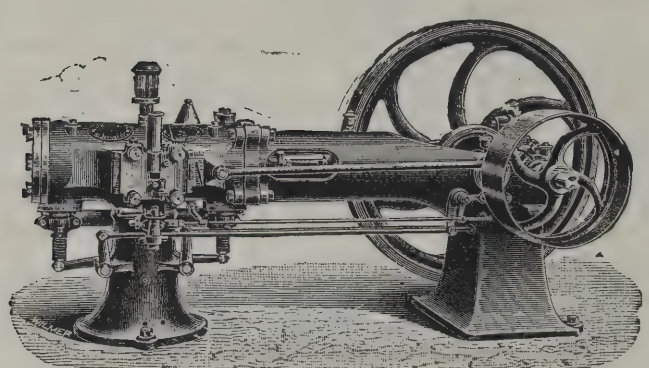
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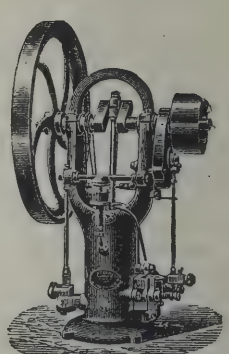
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Friday, November 20, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, NOVEMBER 27, 1891.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

TENDERS, ETC.

*** *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

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COMPETITIONS OPEN.

BELFAST.—Jan. 1.—Competitive Plans are invited for a Hospital for Diseases of the Chest. Details can be had from Mr. F. Howard Sinclair, M.D., hon. sec. med. staff, 76 Pakenham Place, Belfast. Plans to be sent in in a sealed envelope, accompanied by a motto.

GLASGOW.—Dec. 1.—Designs are invited for Buildings in Kelvingrove Park. Dr. F. L. Robertson, Hutcheson's Buildings, Ingram Street, Glasgow.

PRESTON.—Designs are invited for Industrial Home for Women. Mr. Titus Thorp, Accountant, Preston.

CONTRACTS OPEN.

ABERDEEN.—Dec. 2.—For Additions, Tonley House. Messrs. Matthews & Mackenzie, Architects, Aberdeen.

ABERGAVENNY.—Dec. 2.—For Building Attendants' Dormitories at the Joint Counties Asylum. Mr. Alfred Swash, Architect, 5 Monk Street, Abergavenny.

APPERLEY BRIDGE.—Nov. 27.—For Building Church. Messrs. Kendall & Bakes, Architects, Calverley Chambers, Victoria Square, Leeds.

BATLEY.—Nov. 30.—For Building Public Baths. Mr. Walter Hanstock, Branch Road, Batley.

BECKENHAM.—Dec. 14.—For Taking Down and Removing Trees. Mr. S. B. Carlton, Engineer, Local Board Offices, Beckenham.

BEXLEY.—Dec. 2.—For Supplying and Fixing Cast-iron Street Name Tablets. Mr. E. R. Boulter, Surveyor, Bexley Heath.

BIRMINGHAM.—Dec. 7.—For Erection of Walling in Connection with the Coal Storage at the Gasworks, Workhouse. Mr. W. H. Ward, Architect, Paradise Street, Birmingham.

BLACKBURN.—Dec. 3.—For Erection of Burial Service Building at Workhouse. Mr. J. Aspinall, 2 Victoria Street, Blackburn.

BLACKPOOL.—Nov. 30.—For Telescoping 100-feet Gasholder with Two Extra Lifts and Supplying Lancashire Steam Boiler. Mr. John Chew, Gas Engineer, Gasworks, Blackpool.

BRADFORD.—Dec. 1.—For Relining Destructor Works Chimney Shaft. Mr. J. H. Cox, Borough Surveyor.

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CARDIFF.—Nov. 28.—For Alterations, Cattle Market Tavern. Mr. J. P. Jones, Architect, 27 Park Street, Cardiff.

CARDIFF.—For Building Warehouse. Messrs. Seddon & Carter, Architects, Bank Buildings, St. Mary Street, Cardiff.

CHARMINSTER.—Dec. 2.—For Erecting New Buildings at Dorset County Asylum. Mr. Thomas Coombs, 5 South Street, Dorchester.

CHELTENHAM.—Dec. 2.—For Building Slaughter-house. Borough Surveyor, Municipal Offices, Cheltenham.

CHESTER-LE-STREET.—Dec. 1.—For Infant School, Southmoor. Mr. Mark Auber, 4 Quayside, Newcastle-on-Tyne.

CLEVEDON.—Nov. 30.—For Constructing Pier-head, with Band Stand and Pavilions. Mr. G. N. Abernethy, Engineer, 4 Delahay Street, Westminster, S.W.

COCKERMOUTH.—Nov. 30.—For Classroom and other Alterations at Christ Church Sunday School. Rev. T. Knowles, Cockermouth.

CONISBROUGH.—Nov. 28.—For Building Caretaker's House at Cemetery. Mr. G. White, C.E., Mexbrough.

DOWNPATRICK.—Dec. 4.—For Heating by Hot-water Apparatus. Mr. P. C. Cowan, County Surveyor, Downpatrick.

DUBLIN.—Nov. 30.—For Taking-down Lattice Bridge and Providing and Erecting New Wrought-iron Plate Girders and Superstructure, also Central Girder and Cross Girders, &c., for Bridge over the Cusher. Mr. W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin.

DUNDALK.—Dec. 5.—For Building Presbyterian Schools. Mr. R. P. T. Logan, C.E., Francis Street, Dundalk.

DUNDEE.—Dec. 1.—For Cast-iron Pipes and Special Castings and Execution of Works for the Water Commissioners. Mr. George Baxter, Engineer, 7 Euclid Street, Dundee.

DWYGYFYLCHI.—Nov. 30.—For Building Villa. Mr. R. Davies, Architect, Bangor.

EXMINSTER.—Dec. 1.—For Additions to County Asylum. Mr. E. Harbottle, Architect, County Chambers, Exeter.

FENNY STRATFORD.—Nov. 30.—For Building Chapel and Sunday School. Mr. H. S. Smith, Fenny Stratford, Bucks.

GELLIGAER.—Dec. 7.—For Building Board School, Brithdir. Mr. J. Williams, Architect, Morgan Town, Merthyr Tydfil.

HALIFAX.—Dec. 4.—For Building Shop.—Mr. W. H. D Horsfall, Architect, 9 Harrison Road, Halifax.

HALIFAX.—Dec. 7.—For Building Bank Premises, Shop and House. Messrs. Utley & Gray, Architects, 10 Waterhouse Street, Halifax.

HYTHE.—Dec. 5.—For Constructing Sewers and Making Roads, &c. Mr. E. S. Wilks, 2 Douglas Avenue, Hythe, Kent.

LANCASTER.—Nov. 30.—For Building Post Office. Mr. H. W. Primrose, 12 Whitehall Place, London, S.W.

LEAMINGTON.—Dec. 4.—For Building Board School, Milverton, and Altering present School for Infant School. Mr. F. Foster, Architect, Euston Place, Leamington Spa.

LEEDS.—For Building Lodge at Blackmoor. Mr. A. Hobson, Architect, 82 Albion Street, Leeds.

LEEDS.—Dec. 10.—For Enlargement of Covered Service Reservoir, Moortown. The Borough and Waterworks Engineer, Leeds.

LEEDS.—Dec. 16.—For Building Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

LICHFIELD.—Nov. 27.—For Building Infirmary. Mr. W. H. Woodroffe, Architect, 214 Great Dover Street, London, S.E.

MATLOCK BRIDGE.—For Building Bath Houses at Smedley's Hydropathic Establishment. Mr. G. E. Statham, Architect, Matlock Bridge.

MELBOURNE.—Nov. 28.—For Supplying and Laying Cast-iron Water Mains. Mr. G. Hodson, Abbey Buildings, Westminster, S.W.

MERIDEN.—Nov. 28.—For Erection of Corrugated Iron Shed and Repairs at the Workhouse. The Clerk to the Guardians.

MONTROSE.—Nov. 30.—For Additions to Craig Public School. Mr. Sim, Architect, Montrose.

NEWCASTLE-ON-TYNE.—Nov. 30.—For Lodge and Conveniences, Cruddas Recreation-Ground. The City Engineer.

PONTARDAWE.—Dec. 1.—For Building Infants' School at Onlewyn. Mr. D. Bevan Turberville, 4 Herbert Street, Pontardawe.

POPLAR.—Dec. 9.—For Building Staircases at the Union Workhouse. Messrs. Clarkson, 146 High Street, Poplar, E.

PORTRUSH.—Dec. 1.—For Erection of Railway-station Buildings. Mr. W. R. Gill, Secretary, Belfast.

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RADCLIFFE.—Nov. 28.—For Additions to Stables, &c., Town's Yard. The Surveyor, Local Board Office, Radcliffe.

RICHMOND.—Nov. 30.—For Constructing Pipe Sewer. Mr. F. Wentworth-Shields. 6 Delahay Street, Westminster, S.W.

RICHMOND.—Dec. 5.—For Drainage Works. Mr. J. Lemon, Engineer, 9 Victoria Street, Westminster, S.W.

RISHWORTH MOOR.—Dec. 14.—For Construction of the Green Withens Reservoir and Catchwaters, for the Wakefield Water Supply. Mr. Henry Rofe, Engineer, 8 Victoria Street, Westminster.

ROCHESTER.—Dec. 10.—For Building Engine House and Boiler House, Construction of Engine Foundations, &c. The City Surveyor, Guildhall, Rochester.

ROMFORD.—Dec. 7.—For Kerbing. Surveyor, Local Board of Health, Romford.

RUABON.—Jan. 1.—For Building Policeman's House, Upper Ponkey. Major T. J. Leadbetter, County Buildings, Wrexham.

SHEFFIELD.—Nov. 30.—For Building Pagoda Works. Mr. E. Holmes, C.E., 7 St. James's Row, Sheffield.

SHELF.—Nov. 28.—For Additions to Farm Buildings at Shoulder-of-Mutton Inn. Mr. John Drake, Architect, Winterbank, Queensbury.

SOUTHAMPTON.—Nov. 30.—For Additions to Eastern District Board School. Mr. E. T. Howell, Architect, 28 Portland Street, Southampton.

SOUTHPORT.—Dec. 2.—For Supply and Erection of Cast-iron Plates and other Works, for partial Reconstruction of Water Tanks at the Baths. Mr. C. M. Beloe, Engineer, 13 Harrington Street, Liverpool.

ST. JAMES'S PARK.—Dec. 15.—For Superstructure, Block 1, Admiralty Buildings. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

STOCKPORT.—Dec. 4.—For Two Urinals, Lower Hillgate and Carr Green. The Borough Surveyor.

SUNDERLAND.—Dec. 12.—For Building Infirmary. Mr. J. W. Donald, Architect, Russell Chambers, King Street, South Shields.

WELCOMBE.—Dec. 21.—For Building Hermitage. Mr. Joseph Yeardye, Architect, 6 Fortescue Place, Ilfracombe.

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For Stores in Regent Road, for the Aberdeen Storage Company, Limited. Messrs. ELLIS & WILSON, Architects, 181A Union Street, Aberdeen. Quantities by the Architects.

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G. Humphreys, Bristol	2,173 0 0
W. Church, Bristol	2,149 0 0
W. Cowlin & Son, Bristol	2,123 0 0
E. Love, Bristol	2,110 0 0
J. H. Brown, Bristol	2,087 0 0
G. Turner, Bristol	1,987 0 0
H. A. Forse, Bristol	1,960 0 0
E. Walker, Bristol	1,950 0 0
H. Rossiter, Bristol	1,944 0 0
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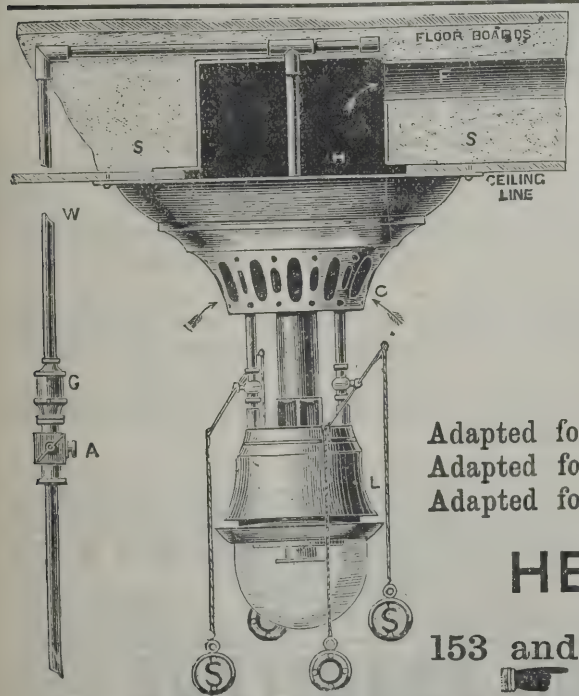
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Weston & Wooley, Wrexham	26,986	24,347	22,869
Davies Bros., Wrexham	26,765	23,345	21,553
Griffiths, Criccieth	24,769	22,314	19,798
J. B. Jones & Evans	24,500	22,200	20,440
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W. Winnard, Wigan	22,462	20,462	19,262
A. Sheffield, Rhyl	21,975	19,778	17,550
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F. Collingwood, Rhyl	20,552	18,452	17,002

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W. WILLIAMS, Gloucester (*accepted*).

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For Building Stores, Stanhope Street, Goole, for the Hull Brewery Company. Mr. C. A. B. TUDOR, Architect, Carlisle Terrace, Goole.

Harrison & Storr, Goole	£577 0 0
F. B. Backhouse, Goole	495 0 0
W. Featherston, Goole	450 0 0
JACKSON BROS., Goole (*accepted*)	425 0 0

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S. & E. Bentley, Leicester	2,251 0 0
J. Neave, Forest Hill	2,223 0 0
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J. Merton, Westminster	2,100 0 0
J. Bentley, Leicester	2,005 0 0
G. Capper, St. Albans	1,988 8 6
W. Coker, Rochester	1,906 8 10
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F. DUPONT, North Hill, Colchester (*accepted*)	5,347 0 0
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For Repairs and Alterations at Godwell House, Ivybridge. Messrs. RENDELL & SYMONS, Surveyors, Newton Abbot. Quantities by Surveyors.

A. E. Johns, Ugborough	£86 14 6
Steere Bros., Aveton Gifford	63 19 0
Jabsley & Vincent, Ivybridge	59 0 0
A. Witheridge, Ivybridge	46 18 6

LONDON.

For Erection of Workshop for the Blind of Kent, on Site of Nos. 49, 51, 53 and 55 London Street, Greenwich. Messrs. GEORGE LANSDOWNE & HARRISS, Architects.

R. H. Bax	£7,409 0 0
J. G. Gorham	7,238 0 0
James Morter	6,960 0 0
H. & E. Lea	6,849 0 0
J. Marsland	6,637 0 0
Hart Bros.	6,597 0 0
D. Charteris	6,438 0 0
S. J. Jerrard	6,389 0 0
H. L. Holloway	6,233 0 0
Stimpson & Co.	6,150 0 0
J. F. COLLINSON *	5,895 0 0

* Accepted subject to certain reductions.

For Construction of Pipe Sewer, Weston Street, Clerkenwell. Mr. WILLIAM IRON, Surveyor.

J. Pizzey, Harringay	£128 10 0
C. W. KILLINGBACK & Co., Camden Town (*accepted*)	126 15 0

For Constructing new Wine Cellar, 18 feet by 12 feet, at the Licensed Victuallers' Asylum, Asylum Road, Old Kent Road. Mr. W. F. POTTER, Architect.

H. L. Holloway, Deptford	£149 0 0
Edwards & Medway, Kennington	106 0 0
W. Wythe, Dalston	94 18 0
WALKER BROS., Poplar (*accepted*)	92 0 0

For Repairs at No. 4 Lansdowne Terrace, Winkfield Road, Lordship Lane, Wood Green. Mr. W. F. POTTER, Architect.

H. DUFFIELD, Stamford Hill, N. (*accepted*).

For New Loose Boxes and Stabling, Liverpool Road, Islington, for the Vestry of St. Mary. Mr. J. PATTEN BARBER, Surveyor. Quantities by Mr. Henry Lovegrove.

ROWE BROS., Camden Town (*accepted*)	£973 0 0

LONDON—*continued.*

For Alterations and Additions to the Central Meat Market, for the Commissioners of Sewers. Mr. WM. HAYWOOD, Engineer; Mr. D. CUBITT NICHOLLS, Surveyor.

W. Neil	£1,061 9 6
Jackson Bros.	1,008 0 0
S. J. Scott	969 0 0
B. E. Nightingale	958 0 0
Dove Bros.	945 0 0
Perry & Co.	935 0 0
Rowe Bros.	932 0 0
C. N. Phillips	902 0 0
J. J. Robson	898 0 0
Mowlem & Co.	897 0 0
J. ALLEN & SONS (*accepted*)	829 0 0
Engineer's estimate	824 0 0

LONGFLEET.

For Erection of School and Buildings at Longfleet. Mr. H. F. I. Barnes, Architect, Poole.

Lucas, Bournemouth	£619 0 0
D. Hitching, Parkstone	561 16 9
A. Saunders, Longfleet	557 10 0
T. C. Rigler, Longfleet	540 0 0
R. Habgood, Longfleet	525 0 0
W. H. C. Curtis, Poole	521 0 0
W. Crane, Longfleet	448 0 0

Fence.

A. Saunders, Longfleet	70 0 0
Lucas, Bournemouth	33 0 0
W. H. C. Curtis, Poole	31 0 0
W. Crane, Longfleet	31 0 0
D. Hitching, Parkstone	21 0 0

LUTON.

For Cooking Apparatus at Workhouse Kitchen, Luton.

Benham & Sons, London	£115 0 0
HERRING & SONS, Chertsey (*accepted*)	178 8 7

NOTTINGHAM.

For Alterations and Additions to the Crown Inn, Awsworth, Notts. Mr. HERBERT WALKER, C.E., Architect, Nottingham.

J. G. Thomas, Nottingham.

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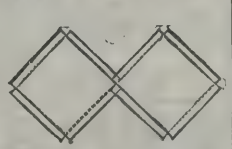
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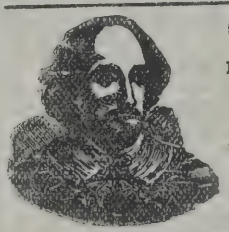
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Prittlewell Street.

E. Iles, South Wimbledon	£850 14 11
W. H. WHEELER, Southwark (*accepted*)	824 14 1

Coleman Street.

E. Iles	692 6 1
W. H. WHEELER (*accepted*)	679 2 5

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G. Wiltshire, Swindon	£185 0 0
F. REEKS, Lymington (*accepted*)	143 0 0

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H. WEBB, Ganarew, Mon. (*accepted*).

DRAINAGE WORKS IN MEXICO.

A CONSULAR report upon the trade of the city of Mexico states that the work for the drainage of the valley of Mexico is now being actively pushed forward, and will, it is expected, be concluded within the next three years. It is divided into two parts—a tunnel and a canal, the former about 6¼ miles long, and the latter approximately 30 miles. The tunnel was commenced during the reign of the Emperor Maximilian, by whose engineers the line was run and the levels determined. The Republican Government continued it more or less intermittently until March 1888, when an English firm of contractors (Messrs. Read & Campbell) undertook to complete it within a given time. Since then the contract has undergone various modifications, but as it at present stands the date fixed for its completion is March 1894. In order to admit of work being prosecuted at several points at once, as well as to provide ventilation and means of access, the original scheme comprised also twenty-five shafts at intervals of 437 yards from each other, of which three were subsequently abandoned. The fall of the tunnel is 1 in 1,388, and the shape somewhat remarkable, the upper part being semicircular and the lower egg-shaped. The total inside area is approximately 147 square feet, the height in the centre is 14 feet, and the width in the widest part, where the arch begins about 5 feet from the roof, is 13 feet 6 inches. The invert is built of blocks of Portland cement set on a bed of volcanic stone. The arch is built of four courses of bricks. According to data furnished to the British Consul by the contractors, the following materials are required for each running metre of tunnel:—2,000 bricks, 106 cement blocks, 83 cubic feet of mortar made of equal parts of lime, sand and powdered volcanic stone, 1 barrel of cement, 73 cubic feet of volcanic stone for backing, and 400 feet broad measure of lumber. When the contractors took over the work from the Government, 1,639 yards of the tunnel had been completed, and 2,937 feet in aggregate depth of the shafts, four of the latter being finished down to tunnel level. Since then the contractors have completed and turned over to the Government 2,295 lineal yards of tunnel and 840 feet in depth of shafts (all of which except five are now finished), and there still remain to be done 7,275 yards of tunnel and 329 feet of shaft. When the Government handed over the work, although several of the shafts were nearing completion, there was actually only one available heading for driving, as the four shafts which had been completed were all communicated with each other and with the lower end of the tunnel. Before the work then could be pushed with any rapidity, it was necessary to finish several of the shafts, and it was in doing this that the real difficulty, which lay in the amount of water, became apparent. To give an idea of the amount of water encountered the Consul mentions that on June 30 the quantity of water being raised from the thirteen shafts then in working was 231,000 gallons per hour, and employing eleven 16-inch and three 9-inch pumps, with thirteen steam-engines aggregating 300 horse-power. As the progress of the work depends on the number of headings it is possible to drive at the same time, any accident, however trifling, which stops the pumping in any shaft for a few hours brings with it serious consequences, as work is perforce suspended on the two headings drained from it owing to the rapid rise of water. Moreover, the difficulty of repairing breakages quickly is much enhanced by the size of the pumps and the

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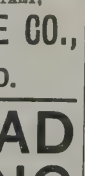
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very small dimensions of the shafts. In spite of these and other difficulties, not the least of which have been the training of the workmen and the necessity for constant supervision over so many isolated points, the work is now progressing satisfactorily. Thirteen shafts with their corresponding headings are now being regularly worked, and the machinery for the remaining four is in position. Seven miles of the canal have already been completed.

BUILDING AND BUILDERS.

AT the meeting of the Plans Committee of the Aberdeen Town Council, it was agreed to approve of the plans for the proposed addition to the railway company's Palace Hotel. The extension will consist of an additional storey, and the estimated cost is upwards of £1,000.

IT is intended to build a new Congregational chapel at Rochdale, to take the place of Providence Chapel, which was discovered to be unsafe some months since. The cost of the new building will be £5,000.

PLANS for the Hutchesontown new church have been sanctioned. The architect is Mr. John B. Wilson, A.R.I.B.A. and I.A., whose design was selected by Mr. William Leiper, president of the Institute of Architects, from those submitted in competition by a selected number of architects.

THE annual meeting of the members of the Bolton Master Builders' Association was held last week, Mr. William Townson presiding, in the unavoidable absence of Mr. William Bryce, president of the Association. The annual report stated the past year has been one in which there has been an increased amount of trade, but at prices still too low. A number of questions have arisen between the employers and operatives with regard to alteration of rules and wages. The report concluded by speaking of the benefits of the Association, and pointing out that it had secured satisfactory settlements of disputes, and pleaded for a full recognition on both sides of fully signed agreements. Mr. Bryce was re-elected president for the ensuing year.

THE *South Eastern Gazette* says:—A conference arranged by the Maidstone, Chatham, Rochester and Strood Master Builders' Association was held recently at the Mitre Hotel, Maidstone, for the purpose of discussing and, if possible, agreeing upon a form of contract that should be more equitable and acceptable than that generally in use in the county, and for discussing other matters of interest in connection with the building trade. There was a large and representative meeting of the principal architects and builders of the county of Kent, upwards of forty being present, and the chair was taken by Mr. G. E. Wallis, the vice-chairman being Mr. Callund, of Rochester. Several resolutions in accordance with the objects of the meeting were unanimously agreed to, and it was arranged to supply, as soon as possible, all architects, surveyors and builders in the county with a copy of the same for adoption in the future.

A MEETING of carpenters, joiners, bricklayers and plasterers has been held at Colchester to consider the best way to improve their condition in the town. A code of rules which had been drawn up by a committee was adopted.

THE preparations for the Isle of Man International Exhibition, to be held next summer at Belle Vue, Douglas, are being rapidly pushed forward. The plans and specifications of the intended buildings have been prepared, and tenders invited for their erection.

THE annual meeting of the Birmingham Master Builders' Association has just been held. Mr. C. H. Barnsley, president, occupied the chair, and there were also present Messrs. J. J. Moffatt, J. Whittall, R. Bulley, G. Twigg, T. Surman, W. Sapcote, J. Bowen, J. Webb, G. Raby, and E. J. Bigwood, secretary. The committee's report stated that during the year builders had been fairly well employed. At the commencement of the year notices were received from the plumbers and the general labourers asking for an advance of ½*d.* per hour, and for the signing of working rules. In the case of the plumbers a set of rules was signed, giving an advance of ½*d.* per hour from April 1, 1891, making the ordinary rate of wages 9*d.* per hour. As to the labourers, a code of rules was agreed upon, the wages being settled at 5½*d.* per hour. Notices asking for an advance of ½*d.* per hour and alterations in the rules had just been received from the bricklayers and labourers, and would receive the careful consideration of the committee.

THE naval authorities at Devonport propose the construction of several supplementary buildings in connection with the naval barracks at Keyham. It has been decided to commence at once the building of drying rooms and skittle and bowling alleys, but the enlargement of the main buildings will not be begun during the present financial year. It has, however, been practically decided to build another large block for seamen and stokers, and a second block for the accommodation of officers.

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TRADE NOTES.

A NEW public-hall has been erected at Newport, which has been ventilated by the "Climax" direct-acting chimney terminal ventilators, designed to harmonise with the architectural features of the building. These ventilators were supplied and fixed by the "Climax" Ventilating Company, 15 Great George Street, Westminster.

THE new schools, Wilmslow, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

THE Colonial College, Hollesley Bay, is being warmed by patent warm air ventilating firegrates, supplied by the patentee and maker, Mr. John Grundy, London, and Tyldesley, near Manchester.

THE patent "Grahtryx" self-acting exhaust roof ventilators of Messrs. Baird, Thompson & Co., of London and Glasgow, are being used for the ventilation of the new Catholic schools, Cardiff.

A LARGE clock has just been erected in the parish church at Tilney All Saints, Norfolk, which plays the Westminster quarter chimes, strikes the hours upon a large bell, and shows time on one dial. It has been manufactured by Messrs. John Smith & Sons, Midland Clock Works, Derby, to the designs of Lord Grimthorpe, and it is guaranteed by the makers to keep accurate time. The same firm are also now making other similar clocks for Aston Cross, Birmingham, and Little Wenlock.

"C. CARR'S," Smethwick, have secured the contract to rehang the magnificent old peal of bells (tenor 1-ton weight) at St. Thomas's Church, Stourbridge, in competition with all the leading firms of bellfounders in the country.

THE contract for the drainage of Flamborough has been let to Mr. Robinson, of Hull, for £1,700, Mr. Dyer, of Bridlington Quay, being the engineer. The total cost of the drainage and connections will be about £3,000.

THE Secretary of State for Foreign Affairs has been informed by Her Majesty's Consul at Corunna that tenders will be received at the offices of the Minister for Public Affairs at Madrid, up to the 16th of December, for deepening the Villaviciosa River, in the Province of Asturias, at an estimated cost of 1,118,564.98 pesetas, equal to about 44,742*l*. The tenders will be opened on the 21st of that month. Conditions, plans and estimates may be seen at the General Office of Public Works, Madrid, and at the Public Works Departm of Oviedo, in the Province of Asturias, where tenders may also be presented.

AN installation of the electric light at Felsted School has just been completed. This is the first public school in the country to be so lighted.

WE desire to draw attention to the advertisement of a sale which is to be held by Messrs. Horne, Sons & Eversfield, in December 1891, when the structures in the Naval Exhibition, which were recognised as possessing exceptional interest, will be disposed of. It might be said that what is sold will never cease to have importance with the public.

THE little church of St. Paul's, Highwood, Writtle, has been reopened after restoration, and new benches have been put in. The flooring is entirely new, and new windows of leaded cathedral glass have taken the place of the old ones. The edifice has been heated throughout on Grundy's principle. Messrs. Choat & Son, builders, of Chelmsford, carried out the work.

VARIETIES.

IT is announced that the Royal Commission for the Chicago Exhibition, 1893, are now prepared to receive applications for space in the British Section. Such applications are to be made upon forms which may be obtained at the offices of the Society of Arts, London, where also information can be procured as to the condition of the exhibition, the charges to be paid for space, &c.

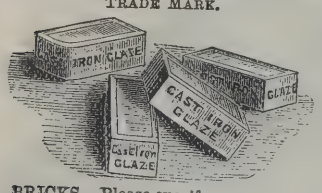
AN inquiry has been held into the application of the Horbury Local Board for sanction to borrow a sum of 13,000*l*. for sewerage and sewage disposal. The details of the scheme were explained by Mr. S. Shaw, of Dewsbury, the engineer.

THE Halifax Town Council have decided to make application to the Board of Trade for a provisional order authorising the Corporation to supply electricity for public and private purposes within the borough.

IT is proposed to erect a memorial to the late Mr. Barry Sullivan, at his grave in Glasnevin Cemetery, Dublin.

AN application has been made by Mr. James Young, railway contractor, Caerleon, Bearsden, for permission to place a window in the parish church, New Kilpatrick, in memory of his father.

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THE gold chain of office of the Mayor of Oswestry, started by Mr. W. H. Spaull, architect, during his mayoralty, has been completed by Mr. Wynne Corrie. Mr. Spaull attached one link to it, leaving his successors to supply one link annually. The links consisted of square tablets of heavy gold filigree work, the remainder of the chain being formed of blue ribbon. Mr. Corrie has now had a heavy gold border placed around each link, and he has completed the chain, the links being connected together by means of twisted serpents.

AT the meeting of the Association of Birmingham Students of the Institution of Civil Engineers, held at the Midland Institute, Birmingham, the president, Mr. J. Edward Wilcox, in the chair, a paper was read by Mr. J. D. Twinberrow, student, on "English and American Rolling Stock."

MORE money is required for the water supply at Crediton, and, in addition to the 2,000*l.* for this purpose, another 1,000*l.* is to be asked for to provide public offices. A Local Government inquiry will be held on the 28th inst.

THE inquiry opened at Birkdale into the application of the Local Board for permission to borrow 18,960*l.* for works of sewage disposal and surface drainage has been adjourned.

AT a recent meeting of the Wetherby Sanitary Authority, Mr. Preston, engineer, attended and laid on the table plans for the proposed new drainage scheme for that place, showing the depths and gradients and the diameters of the pipes to be used. The cost will be about 5,000*l.*

THE Manchester Ship Canal Company are about to apply to Parliament for powers to acquire additional lands, for an extension of time for the construction of the Warrington dock, and for other purposes.

AT Rawmarsh an inquiry was held in reference to an application made by the Local Board for permission to borrow 2,000*l.* for providing public offices. The estimated cost of the proposed offices was 2,187*l.*

THE Government have decided to undertake the drainage of Cairo. For this purpose they invite engineers and others to send in plans. These will be received by the Public Works Ministry up to January 31. A commission composed of an Englishman, a Frenchman and a German will be appointed, and they will be empowered to select the best scheme which is presented or to adopt one of their own making. The author of the scheme approved of is to receive a premium of 200*l.* The smallness of this sum and the short time allowed for a work of such magnitude will probably restrict the competition. Mr. Baldwin Latham two years ago furnished the Government with a complete plan and an estimate of its cost, but French opposition stands in the way of its adoption.

THE Gloucester City Council have agreed to the appointment of a committee to consider the desirability of the Council acquiring the City Gasworks.

THE development of the coalfields of West Yorkshire is just now said to be proceeding at a rate hitherto unequalled. It is expected that within the next three years the West Riding will be able to turn out at the rate of not less than 30,000,000 tons of coal annually.

THE *Liverpool Courier* says:—There has been formed in Liverpool a company called the Overhead Railway, whose primary object is to carry a railway line on stilts along the margin of the docks. It has been a long time in course of construction and still appears to be a long way from completion. There is some vague hope that it will be opened for traffic in May next. Until it is completed and in working order it is impossible to determine what will be its true character—whether a public convenience or a public nuisance.

THE new theatre in St. Martin's Lane, which is now ready for roofing in, is to be known as the "Trafalgar."

A SECOND Eiffel tower for France is proposed to be constructed at Fouvières. The foundations, base and masonry work will be carried out by a Lyons firm of contractors.

AT a special meeting of the Birmingham City Council this week the draft of a Bill empowering the Corporation to obtain a supply of water from the rivers Elan and Claerwen, in Wales, was considered. Sir Thomas Martineau, in proposing the approval of the Bill, explained that authorisation was given for borrowing 6,600,000*l.* This amount was necessary in order to meet the requirements of the next fifty years. The first instalment of works was estimated to cost 3,340,000*l.* The Bill was approved, and it was decided to call a town's meeting to obtain the sanction of the ratepayers.

THE Oldbury Local Board some time since invited applications from engineering experts with regard to laying down an improved system of sewage disposal at their outfall works. The population of Oldbury is about 20,500, and the average daily flow of sewage is computed at 500,000 gallons. Three engineers were selected to submit schemes to be sent in under motto. At the last meeting of the Local Board the Sewerage Committee recommended that the scheme marked "Forward" should be

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adopted, that schemes marked "A 1, A 2 and A 3" should receive the second prize, and that the scheme marked "Practical" be awarded the third prize. The report of the committee was unanimously adopted. The author of the selected scheme is Mr. H. Bertram Nichols, C.E., of Birmingham. The system proposed is that known as the "International Process." The existing works and land will be utilised as far as possible, the present tanks being altered in construction to adapt them to the new process. The sludge will be pressed into cakes, the necessary buildings and machinery being provided in the scheme. The cost is estimated at about 6,000*l*.

IN the forthcoming session of Parliament the North-Eastern Railway Company intend seeking powers enabling them to make additions and alterations at various places on their system. The most important project is the making of a lock near Hedon Road, Hull, with an entrance from the river Humber, containing 32 acres. It will be 800 yards long and 200 yards wide, and will therefore be an important addition to the accommodation for shipping already provided at this port.

A BRONZE statue has been erected at Barrow-in-Furness in memory of the late Mr. Henry William Schneider, who was connected with the town from the time when it was a mere fishing hamlet, and had much to do with bringing about its present position of commercial and industrial prosperity. Mr. Schneider discovered the valuable iron ore deposits at Park, situate in the borough of Barrow. These mines are still in active operation, and since they were opened 10,000,000 tons of ore have been raised and about £600,000 paid in royalty. Subsequently Mr. Schneider, in company with the late Mr. Robert Hannay, commenced blast furnaces at Barrow for smelting the ore, and later on the Barrow Steel Works were started. These works are amongst the largest of their kind.

A SKETCH of the Gateway Chapel at Worksop Abbey, by Mr. Burke-Downing, A.R.I.B.A., appears in the *Daily Graphic* of Saturday, the 21st inst.

MR. W. LLOYD WISE, county councillor for the Southend Division of Essex, and member of the Kent and Essex Sea Fisheries Committee, has addressed a letter as follows to the Secretary of the London Chamber of Commerce:—"I feel constrained to resign my membership of the London Chamber of Commerce. I do so with much regret, as a protest against the proposed attempt to influence public opinion and the legislature on the Thames Sewage question, by means of a committee professedly representative, but on which (although special representatives have been put on for other places, including one for South-East Essex, with the latter of whom I am in complete accord) the rapidly increasing town of Southend, which is so peculiarly and vitally interested in this all-important question, has been expressly denied a special representative, and the whole question is being treated as one affecting the upper portion rather than the mouth of the river—thus ignoring especial injury to Southend and other important places near the river's mouth, not only such as already suffered, but also involved in different schemes proposed."

THE Christmas number of the *Gentlewoman* contains a beautiful art picture on fine satin panel as a supplement, realising Tennyson's well-known lines, "Her eyes are homes of silent prayer." The face portrayed is charming, and the careful way in which it is printed lends an extra charm to the whole thing. The number is full of interesting tales by some of the best authors. A novel idea is the opening chapter of a new tale which will appear week by week, each chapter being written by some well-known writer of fiction, entitled "The Fate of Fenella."

STRUTTING BUILDINGS IN MANCHESTER.

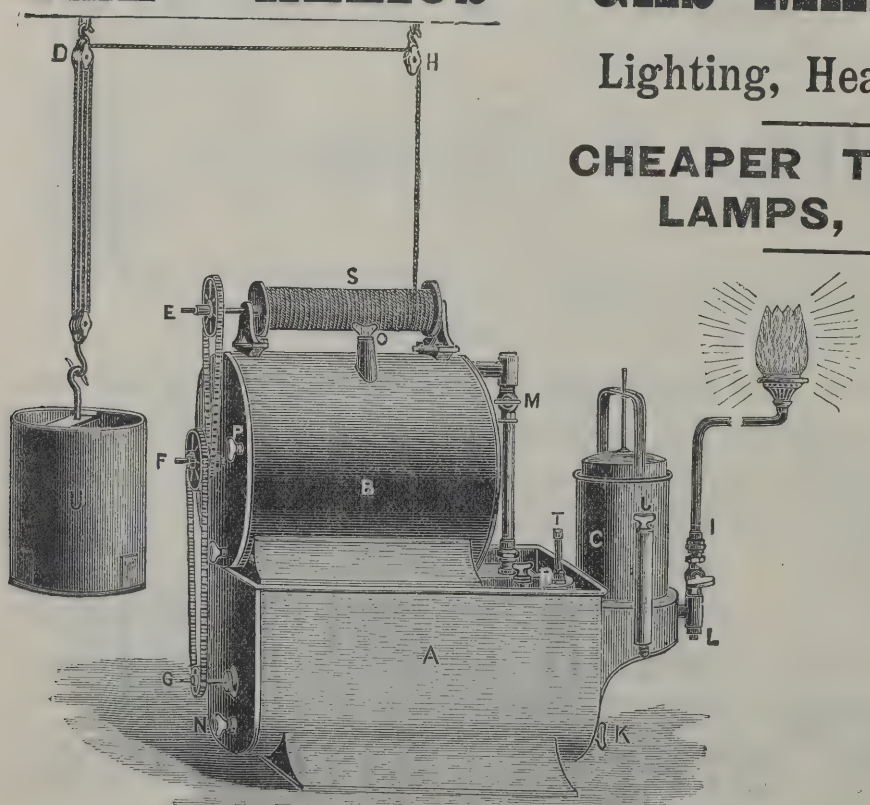
AN application was recently made in the Chancery of Lancashire for an injunction against the Lever Strutt Building Society in respect of trespass on the land belonging to trustees of Richard Higham. In 1872 he built some houses upon land which he owned in Queen's Road, Cheetham. The houses were five storeys high and the land sloped very considerably. The defendants were mortgagees of certain property on the other side of the plaintiffs' passage, and they asked permission to place strutts between the two sets of buildings. When the plaintiffs' houses were built there had been a serious settlement, and they were not unnaturally afraid to allow any extra weight to come upon their buildings. Permission to erect the strutts was declined, but in July 1890 the defendants took "French leave" and erected fifteen strutts. Subsequently they made a hole in the plaintiffs' passage and put in the concrete foundation complained of. The trespass in respect of which the injunction was sought was comprised under four heads—first, the erection of strutts by which it was calculated considerable pressure would be caused to the plaintiffs' buildings; secondly, the knocking down of a wall which belonged to the plaintiffs; thirdly, the making of a hole in the plaintiffs' passage; and

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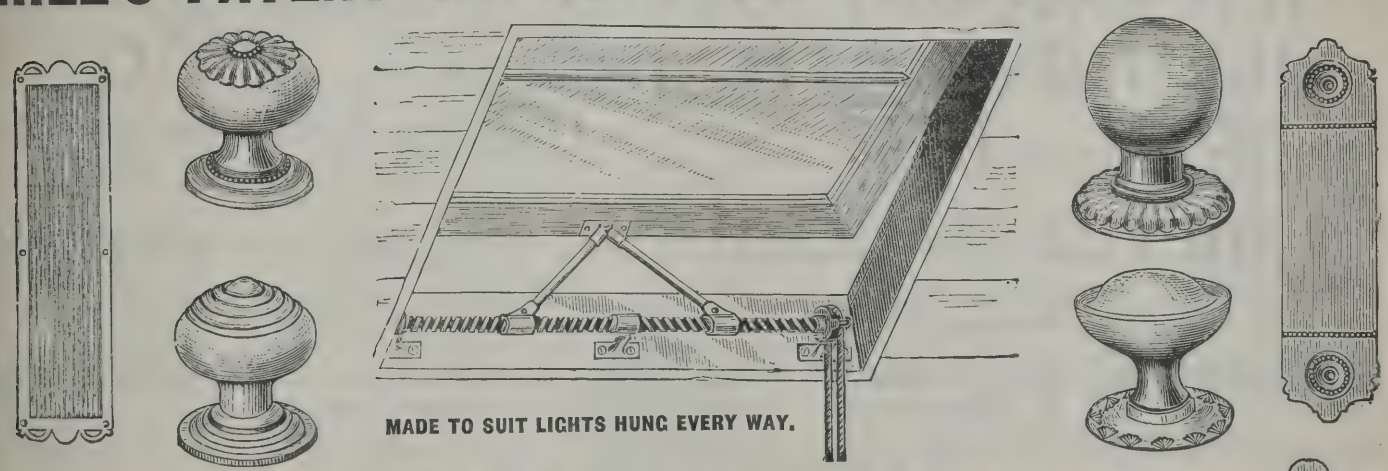
fourthly, and this was the most important matter, the taking for the defendants' own convenience, and to avoid spending money, part of the plaintiffs' land for the purpose of forming a foundation for their own wall. In regard to the last-mentioned head, the defendants had encroached under the plaintiffs' wall, and to the extent of 2 feet into their passage, for the purpose of making the cement foundation. One result of that would be that if such concrete work were allowed to remain for the period of twenty years, the defendants would have established an easement which would prevent the plaintiffs from dealing with the passage as they chose. In their pleadings the defendants admitted that they had placed the concrete under the wall and passage, and had paid 40*s.* into court in respect of damage caused thereby. Counsel read a long correspondence which took place, and said that the defendants pleaded that they were ordered to do the work by the City Surveyor, and they characterised the action as unneighbourly and frivolous, and demanded that the plaintiffs should consent to its being dismissed. Counsel for defendants said the act complained of with reference to the concrete was not a continuing act. He was not seeking to justify the concrete being there permanently. It could easily be removed. The Vice-Chancellor said he must protest most earnestly against the theory that, in a great city like Manchester, where the rights of supports to property were very valuable indeed, any person could go and make a hole in his neighbour's property and then say he justified it by the payment of 40*s.* into court.

Eventually, terms were agreed upon for a settlement of the case.

BRITISH IRON TRADE ASSOCIATION.

A MEETING of the board of management of the Iron Trade Association was held on the 13th inst. in London, under the presidency of Mr. W. S. Caine. The meeting considered the question of whether any evidence should be offered before Group A of the Royal Commission of Labour, and decided that such evidence should be submitted as would enable a comparison to be made of the differences that distinguish the conditions of labour in this and other ironmaking countries as regards the rates of wages and actual earnings of labour, the hours of employment, the regularity of employment, the comparative efficiency of labour in reference to the results realised for a given amount of wages, the extent and effect of juvenile and female labour, the extent to which accidents occur and the comparative liability thereto, and other matters on which a comparison is possible. A *précis* of the evidence so to be submitted was considered and adopted, subject to further examination and revision, and it was decided that in submitting such *précis* the secretary of the association, Mr. J. S. Jeans, should give oral evidence if that should be deemed desirable. The secretary submitted a memorandum as to the provisional order bills of the railway companies which received the Royal assent on August 5 last. The decision of the joint committee of Lords and Commons to remove about nine-tenths of the iron and steel manufactures produced by the members of the association from Class B, where it had been placed on the Board of Trade classification, to Class C, was stated to be very unfortunate for the trade, inasmuch as it would entail the payment of maximum rates, varying from 40 to 50 per cent. higher than would have been payable if the Board of Trade classification had been allowed to stand. Besides this, the manufactured iron trade would now require to pay an increased station terminal of a shilling, including both ends, and service terminals to the amount of 8*d.*, where no service terminals were required under Class B. The provision as to sidings, which was of the utmost importance to the iron trade, left the companies at liberty to make special charges for their use, if the amount is fixed by an agreement in writing, signed by the trader, "or determined, in case of difference, by an arbitrator appointed by the Board of Trade." The memorandum was received, and it was resolved that it should be printed and circulated among the members of the trade. Mr. Bleckly, of Warrington, brought forward the subject of the decision given by Mr. Justice Chitty, in which he held that as the word "Britannia," used in connection with the manufacture of soap, was a geographical expression, it was not capable of being registered and was accordingly ordered to be removed from the register. The Board held that this was a decision of great importance to the iron trade, as many firms use geographical expressions as trade marks, and directed further inquiry to be made as to the effect of Mr. Justice Chitty's decision on such marks. The Board resolved to take steps for the issue of a periodical bulletin of statistical information relating to the production, import and export of iron and steel in different countries, and matters of cognate interest. A letter was read from the secretary to the London Chamber of Commerce requesting the Board to co-operate in the work of the mining section lately formed in connection with that Chamber.

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PORTLAND CEMENT.

AT the second ordinary meeting of the Institution of Civil Engineers three papers were read relating to Portland cement and Portland-cement concrete. The first was "Portland Cement; its Manufacture, Use and Testing," by Mr. Henry Kelway Bamber, F.I.C. The author gave analyses of the most suitable clays and chalk to be used in the manufacture of Portland cement, and described the process of preparing and mixing these ingredients, drying the resulting slurry, and of burning. The average composition of good cement was indicated. In these operations care and constant chemical testing were necessary to keep the ingredients in proper proportion, so as to insure the regular percentage of each in the finished cement. Reference was made to the packing in the kilns of the dried material in lumps of a size not too large to prevent the heat from being evenly distributed through the entire kiln, otherwise there would be a large proportion of insufficiently burned and unclinkered produce. In clinkering, the material entered into semi-fusion only, and it was during this process that the properties of good cement were produced. Given therefore proper proportions of ingredients and proper burning, so as to obtain good clinkers, the result would be good cement. This had next to be ground to fine powder and sifted, so that all should pass through a sieve of 2,500 meshes to the square inch, and not less than 90 per cent. should pass through a sieve of 5,625 meshes to the square inch. The finer the cement the more easily was it thoroughly mixed with water, which insured its proper setting without the chance of blowing afterwards. About forty pounds of water should always be used to every cubic foot of cement. This would insure that every portion of cement should have the full quantity it could combine with, and if this were done no blowing could take place, because blowing was caused by portions of cement taking up water and expanding after the body of the cement was set. The author made experiments three years since with concrete composed of four parts of shingle, two of sharp sand and one of cement. These were mixed in duplicates, the first lot with the full quantity of water it could take and the others with only half that quantity of water. These blocks after twenty-four hours were put on a wall and were covered twice every day for twelve months by the tide. At the end of the year they were cut through the centre. Those made with the full quantity of water were sound, hard and perfectly dry all through; those made with half the quantity of water were wet through and easily broken to pieces. As there was no difference in any of the ingredients except the quantity of water used, this showed that for concrete to set properly and satisfactorily it must at the outset have the full quantity of water mixed with it. These blocks were made with new cement a day or two old, showing that new cement was perfectly safe if mixed in proper proportions. In the ordinary course cement would be about a month old when used, and there was no advantage in keeping it longer, for it began to lose its power of combining with water, an old cement not being able to absorb and combine with nearly so much water as new cement. In newly-ground good cement the particles were in such a molecular state as to quickly combine with water, forming a hard permanent crystallised solid. By age there was evidently a molecular change gradually taking place, for after a time the cement, although not exposed to the air, lost its power of setting when mixed with water, although the percentage composition might be exactly the same. The author then described the best test to determine if the cement were good:—First, there should be a chemical analysis to show the proportions in which each constituent existed, but as this in itself was not sufficient to show if the cement had been fully clinkered, he recommended the taking of the specific gravity, which should not be less than 3·10 to 3·15 at the end of a month. This was much more reliable than the ordinary use of the striked bushel, which varied considerably, according to the way in which the vessel was filled. Then ensued the mixing of the cement with water, and the forming into briquettes to test the breaking-strain at 7, 14 and 28 days; the quantity of water in these briquettes varied with each manipulator, the general desire being to use as little water as possible. The author thought, however, that it should be stipulated how much water should be used in making the briquettes, when the results with the same cement would be more uniform, for a cement that could not take up its full quantity of water, 20 per cent. to 25 per cent. of its weight, was not as good as one that could do so, other things being equal. A good cement, not too old, would expand in setting and completely fill the space allotted to it, whereas an old cement would not do so, and consequently spaces would be left for water to enter and weaken it.

The second paper, by Mr. Alfred E. Carey, M.Inst.C.E., was entitled "The Inspection of Portland Cement for Public Works." The author emphasised the following points:—Uniformity of the raw materials; completeness of the mechanical blending of the raw materials; the proportion of carbonate of

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lime; the thoroughness of the wet-grinding; the burning; the flouring; the aëration and packing of the finished cement. Particulars were given of the chemical analysis of various clays in use, and it was pointed out that the hydraulic factors were the silica and alumina, with iron, and that the highest standard of quality was probably attained when the ratio between these was

$$\frac{\text{lime}}{\text{hydraulic factors}} = 2.$$

The various processes for the mechanical blending of the raw materials were described, and special stress was laid upon constant chemical testing at this stage of manufacture, and also on the thoroughness of the blending in a wet state. In regard to burning clinker, the author traced the various chemical changes which took place and the corresponding temperatures. He considered that a temperature of about 2,900 degs. Fahr. maintained for a short time only was the most favourable for producing high-class clinker. He described the more recent systems of burning cement, giving details of the Ransome and Joy processes, and advocated the adoption of the test by specific gravity instead of by weight per bushel. He proposed for this standard 3·1; a high specific gravity, combined with extreme fineness, being one of the surest means of proving that a given sample of cement was well burnt. In respect of fine grinding, it was pointed out that it was the flour or impalpable powder which formed the effective part, the nibs or coarse residue forming an adulterant similar to the admixture of a corresponding proportion of sand. This was proved by a series of experiments, in which the residues, on a succession of sieves, were removed from a given sample of cement, when the tensile strains were proportionately increased. The question of the dry-grinding and the temperature of cement, as it left ordinary mill-stones and edge-runners respectively, was then referred to. The author considered aëration essential with cement as now usually manufactured. With regard to packing, the want of a less expensive and more efficient packing-case than the ordinary cement-barrel was mentioned. The author suggested that for foreign works clinker might sometimes be conveniently exported and ground on the spot. As to the question of testing, he considered that a test of ½-inch × ½-inch section would in some cases be a useful guide, and described the various apparatus now in use for the purpose of compression-testing, calcimeter-testing, taking specific gravity, &c. On the question of standard regulations, the rapid progress which had been achieved in quality in England, despite the absence of any Government tests, was pointed out, and it was stated that had such a standard been formulated ten years ago, its effect would probably have been retrograde. The practice of foreign governments and societies as to standard tests was detailed, and a specification was given applicable to the present stage of cement production. Minute particulars of the various points to be noted in gauging briquettes were given and the subject of the adulteration of cement was dealt with. The author did not believe adulteration was much practised in this country, although the Society of German Cement-manufacturers had thought it desirable to formulate special rules on the subject as regarded Germany. In dealing with the use of cement, the author stated that in his opinion cement and concrete were likely to take the place in many respects of iron and timber as now applied. He also gave particulars of a series of experiments carried out by Mr. Joseph Cash, M.Inst.C.E., at his request, in order to test the power of Portland cement to resist long-continued hydrostatic pressure. These tests were made with concrete of varying proportions, and a further series was carried out to ascertain the extent of the penetration of cement on the surface of a mass of rough concrete. Another series dealt with the question of the extent to which rough concrete would prevent filtration. The efficacy of rendering a surface of concrete in connection with hydrostatic pressure was also discussed. The quantity and purity of water for concrete-making was referred to, the author detailing the results of the admixture of fine river-mud of varying proportions on the strength of concrete blocks. The effect of the presence of sulphuric acid as observed by experiment was given, as also the effect of frost upon cement briquettes and *per contra* of high temperatures such as prevail under tropical conditions. The effect of sea-water on the maturing of concrete was dealt with, the author considering that when gauged with sea-water concrete matured more rapidly and passed more quickly into the crystalline condition than when gauged with fresh water. The limits within which concrete might be safely applied, more especially on works in the sea, were defined, it being shown that two distinct issues had to be considered in dealing with this much-debated subject:—1. The influence of magnesia as an ingredient in the manufacture of cement. 2. The alleged deterioration of sound cement when subjected to the action of sea-water. He showed that caustic lime or caustic magnesia were both harmful in cement, but that a high percentage of magnesia, when clinker was well burnt, was not necessarily deleterious. In dealing

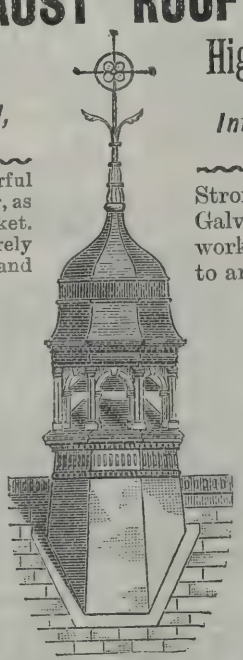
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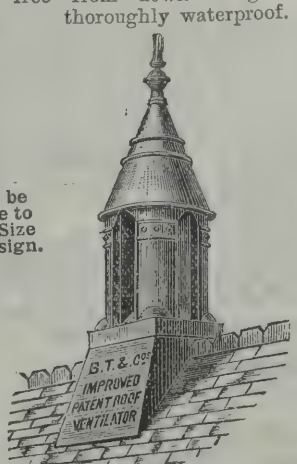
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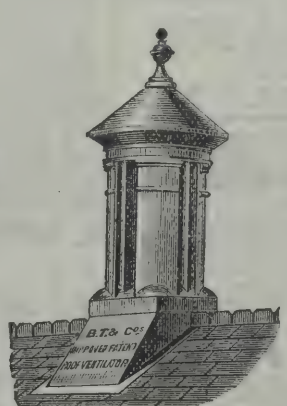
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with the second branch of the subject, the author pointed out the desirability of Portland cement not containing more than 4 or 5 per cent. of magnesia, because this material was really an adulterant and not actively useful. He detailed particulars of a series of experiments with cement-sand briquettes of varying proportions which had been exposed to long-continued tidal action without harmful effects, and gave the increase in the weight of these briquettes. He also referred to a series of tests with fresh water, varying proportions of fresh and sea-water and sea-water partially evaporated, it being pointed out that in situations in which ammonia might be brought into contact with concrete it was desirable to use fresh water for gauging, and to exclude cement containing any considerable proportion of magnesia. The author's opinion was, however, that no conclusive evidence had been adduced to prove that the precipitates from sea-water induced disintegration of even fissured or porous concrete when sound cement was used. In conclusion, the author referred to the chemical and physical transformations of Portland cement in setting and the general chemical conditions under which Portland cement of the highest class was obtained.

The third paper read was on "The Influence of Sea-water on Portland Cement Mortar and Concrete," by Mr. William Smith, M.Inst.C.E., of Aberdeen. In the course of a discussion which took place at the Institution in the year 1886, the author, who was the engineer of Aberdeen Harbour, had stated that since the construction of the south breakwater at that place in 1872 he had noticed "the disintegration of the surface of the concrete by the chemical action of the salt water on the Portland cement." The softening and swelling of the concrete wing-walls at the entrance of the graving-dock induced him in the following year to refer the matter to the late Professor Brazier, of Aberdeen University, for a thorough investigation of the chemical reaction causing disintegration. In June 1887, that gentleman gave his opinion that the analyses of the series of decomposed cements (concrete) showed a remarkable difference in composition from the original cement, inasmuch as in all the samples submitted to him there was found a large quantity of magnesia, and a large proportion of the lime was in the form of carbonate. He believed that this alteration was brought about entirely by the action of sea-water upon the cement. There was no other source for either the magnesia or the carbonic acid. The author then reported that "the rapidity of the chemical action was due to the unbalanced pressure of the water on the wing-wall" when the dock was emptied. This caused a current of sea-water through the porous structure of concrete, which continually washed the decomposed cement into the dock, and brought new particles of concrete into contact with the sea-water. In July 1887, Mr. P. J. Messent, M.Inst.C.E., was requested to make an independent investigation of the cause of the deterioration of the concrete, and in the following November issued a report confirming the results obtained by the author and Professor Brazier, by experiments at the Tyne piers and by additional analyses of the disintegrated concretes by Mr. Pattinson, the public analyst for Newcastle-on-Tyne. From a series of experiments and investigations by Professor Brazier and himself, the author inferred the cause of the expansion of concrete, subject to the influence of sea-water, to be the formation of a more bulky compound of magnesia and lime with carbonic acid, and especially with sulphuric acid and water, in place of the lime of the cement. The chemical equations for the action of the lime in the cement upon the magnesian salts in sea-water were :—

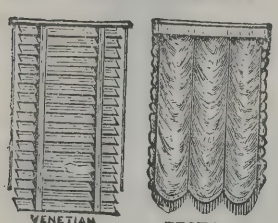
Magnesia chloride + calcic hydrate = magnesic hydrate + calcic chloride.

Magnesic sulphate + calcic hydrate = calcic sulphate + magnesic hydrate, the sulphate of lime crystallising with water as :— Calcic sulphate + water = hydrated calcic sulphate, a substance of great bulk compared with the lime base.

The lime of the cement took up the free carbonic acid from the sea-water, forming carbonate of lime ; the sulphate, carbonate and hydrate of magnesia in the sea-water were filtered out and united with the lime, forming a deposit of magnesia and hydrated sulphate of lime, which, being bulkier than the lime base, caused swelling and disintegration of the concrete, while the magnesia destroyed the adhesive power of the cement. The author proceeded to point out, from experimental tests carefully made, that the presence of magnesia in the cement, before mixing with water and setting, was not the cause of subsequent disintegration, and that even 5 per cent. of magnesia in the cement only diminished its tensile strength 20 per cent., causing no tendency to disintegration. Sulphate of lime and carbonate of lime might similarly be present in the unslaked cement without much harm or any tendency to subsequent disintegration of the concrete. The disintegration was clearly due alone to the chemical reaction between the sea-water and the lime of the cement. All the lime (about 60 per cent.) of the cement was, so far as affected by this action, quite free, there being no stable chemical combination of the lime, alumina, &c., in cement. A series of experiments on the filtra-

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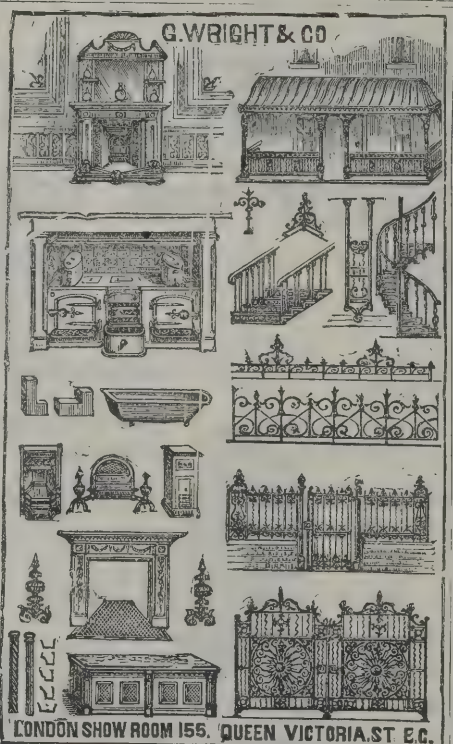
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GOLD MEDALS—HUDDERSFIELD, 1883 ; LONDON, 1885.
SILVER MEDAL—PARIS, 1889.

tion of sea-water from a height of 24 feet through porous blocks of concrete was given in a tabular form in an appendix, showing, by the gradual decrease of the quantity of water passing through, the closing up of the pores of the concrete by the accumulation of the chemical by-products in the material. The paper concluded with a description of the effect of the compression of air by the inflow of sea-water to cavities in the breakwater in bursting out the concrete blocks forming the sides of the cavities. The conclusions arrived at were—that the chief causes of the destruction of concrete sea-works were the chemical action of sea-water and the sudden compression of air within the structure by waves, and that the same remedy applied to both evils, namely, the formation of an impermeable homogeneous structure.

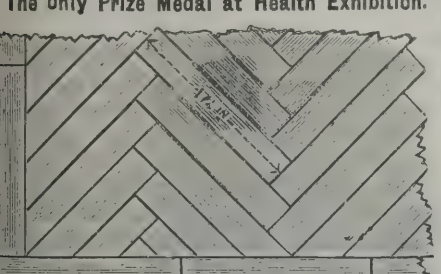
REFUSE-DESTRUCTOR, ASTON.

THE foundation-stone of a refuse-destructor which the Aston Local Board purpose erecting at their sanitary depôt, Chester Street, at a cost of 6,138*l.*, has been laid. The work will be carried out by Messrs. Manlove, Alliott & Co., of Nottingham, the engineer being Mr. W. A. Davies, surveyor to the Local Board. The refuse is put into the destructor, and from it there are sufficient ashes and combustible material found to keep the furnaces going when once lighted, no other fuel being necessary. The temperature of the furnaces ranges from 400 to 1,000 deg. Fahrenheit, according to the firing, and considerably less heat than the lower is sufficient to effectually destroy any germs of disease, and to consume the injurious products of combustion before being passed into the open air. Patent fume-cremators are also provided, through which all gases from the furnaces pass, and over a fire the temperature of which sometimes reaches 1,500 deg. Fahrenheit, from thence conducted into a chimney-shaft 160 feet in height. The intense heat, which it is estimated will be sufficient to develop 45 horse-power, will be utilised for driving machinery and generating electricity, and in dealing with the clinker or residuum which will be left after the burning. This residuum can be ground up for concrete, mortar, or made into paving-blocks, or used in the construction of streets, and a suitable boiler is provided in the main flue of the destructor. The amount of house refuse and street sweepings, &c., to be disposed of is 30,000 loads per annum. Part of this can be carted to tip, and about 10,000 loads can be sold to farmers for the land. Each of the eight cells of the refuse-destructor, it is estimated, will burn from eight to nine tons per day of twenty-four hours, and the eight cells should burn, if properly stoked and attended to, about 22,000 tons per annum. The works consist of an eight-cell destructor, roofed over, and in connection with the same is Jones's patent fume-cremator. A chimney-shaft, 160 feet in height, and an inclined approach for the carts to be drawn up to discharge the refuse on the top of the furnaces, which are 14 feet above ground level and fed from above, will also be provided.

THE METROPOLITAN WATER SUPPLY.

NOTIFICATION is given of an intended application to Parliament next Session by the Corporation of the City of London and the London County Council for an Act to authorise and provide for the appointment of a Water Committee, to consist of members chosen by the Corporation and the Council. The Act will contain clauses for conferring on the Council power to promote Bills in Parliament to acquire, construct and maintain waterworks, &c., and to do "any necessary acts in connection therewith to afford a new or supplemental water supply;" to acquire or lease any existing or future waterworks; to provide for the dissolution and winding up of any water company whose undertaking shall be acquired by the Council; to sell, lease or dispose of any such undertaking, or portion thereof, at any time vested in the London County Council; and to make provision for raising the money which might be required for carrying the intended Act into effect, or any Act promoted or obtained by the Council in pursuance of the intended Act. By other clauses power will be asked for "to supply the inhabitants, or any county, or local authority, or corporation within such area, and on such terms as Parliament shall from time to time authorise or direct, with water by meter or otherwise, for all public and private purposes;" and "to carry on, consolidate, enlarge and improve such undertakings as the Council may, by authority of Parliament, acquire or construct, or to regulate and control the water companies and their undertakings." The Bill will contain clauses for conferring on the Water Committee powers to make and enforce regulations for prescribing the strength, character, &c., of fittings and appliances for preventing the waste and undue consumption of water; to make any public or private inquiry into the existing supply within the metropolitan

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water area, and the charges made for the same, and into the possible future sources of supply; to enter into negotiations with any public authority, &c., for acquiring or leasing any of their powers or undertakings, and to empower the London County Council to delegate to the Water Committee "certain administrative powers for carrying on the supply of water which may be conferred on the Council by the intended Act." The Bill will also seek to confer on the London County Council and the proposed committee "powers as to the entry upon lands and works of any water company, and the inspection of the same, and the plant therein, and to require the production of books, documents and accounts by any water company;" and, further, to provide for the payment of costs, &c., out of the county rate.

A BUILDING DISPUTE.

AT the Tavistock County Court, the claim of Mr. Isaac Roskilly, builder, Calstock, against Mr. Joseph Bowhay, farmer, Calstock, for 42*l.* 3*s.* 7*d.*, for work and materials, again came before his honour Judge Edge. This case was before the court on September 19 last, and on the suggestion of the judge was referred to Mr. Snell, of Plymouth, for arbitration, but as he was unable to act at the time, by the consent of both solicitors the matter was referred to Mr. T. Lang, of Liskeard. He had made his award in favour of the plaintiff for the full amount claimed, with an additional charge of 17*l.* 16*s.* 8*d.* against the defendant as personal costs in connection with the making of the award. It was explained that Mr. Lang was engaged four whole days going into details, measuring quantities and testing the value of the work. Mr. Lang had also to engage a carriage and pair to take him to and from Calstock each day. His honour confirmed the arbitrator's award, and judgment was entered accordingly.

SANITARY ENGINEERING.

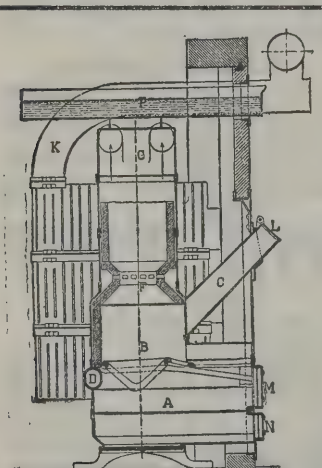
MR. JAMES THOMSON, C.E., gave a lecture on "Sanitary Engineering: its Present and Future Position in Relation to the Architect's Work," at Edinburgh, at a meeting held under the presidency of Mr. J. H. Anderson, C.E., vice-president of the East of Scotland Engineering Association. The lecturer considered the drainage arrangements of the better class of houses in Edinburgh were models worthy of imitation. On the subject of water waste he suggested that, instead of the costly and irritating inspection of water fittings in houses for this purpose, the Water Trust should carry out experiments on a large scale for the purpose of thoroughly testing the different systems of hot-water supply piping, with a view to lessening the enormous waste which goes on in connection with this class of piping. The recent movement for the registration of plumbers was considered to be already showing its beneficial effects in the trade. A discussion followed, and at the close the lecturer was cordially thanked for his interesting paper.

LONDON BOARD SCHOOLS.

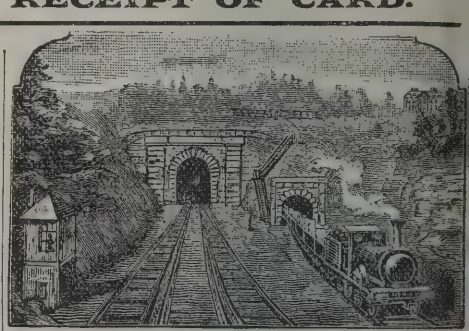
THE action taken by the School Board of London against Mr. Johnson, contractor, has ended in judgment for the defendant. The case, it will be remembered, came before Mr. Justice Denman lately, who postponed judgment, which has been given as follows:—

The plaintiffs in this action sought to recover very large sums of money, amounting, on the whole, to 4,000*l.* odd, against the defendant in respect of work done or omitted to be done by him some years before action brought on three Board schools which defendant undertook to erect for the plaintiffs under three contracts which, for all practical purposes, were identical in their provisions. The defendant had been paid soon after the completion of the several schools upon certificates of the architects, but it was contended that the Board was entitled to claim damages notwithstanding the lapse of time since the receipt of the sums paid, and notwithstanding the architects' certificates, by reason of the special provisions of the contracts between them and the defendant, and on the ground that the payments made to him had been obtained by fraud. The provisions of the contracts bearing upon the disputes between the parties were contained in the contracts themselves and in the specifications and conditions annexed thereto. The prices were respectively 11,600*l.*, 12,200*l.* and 12,900*l.*; total, 36,700*l.* The main provisions constituting the relation between the parties were contained in the following conditions: Nos. 3, 4, 5, 9, 11, 16, 19, 20 and 22. The plaintiffs on March 24, 1890, brought their action for alleged breaches of the three above-mentioned contracts, and it is important to observe the exact nature of these complaints as set out in their statement of claim. The defendant in his defence denied that he had been guilty of any fraud, default, or wilful deviation, and in

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157 STRAND, W.C. (Four Doors from Somerset House) LONDON.

paragraph 4 set out the 20th condition of the contracts, which provided that a certificate of the architect showing the final balance due to him was to be conclusive evidence of the completion of the works, and that the balance was payable. The defendant alleged that he had received such certificates, and that the time provided by condition 16 (*i.e.* four months) had long since elapsed. The plaintiffs delivered particulars at various times of defects which they alleged to have been discovered and to be due to fraud, default, or wilful deviation. I do not think it necessary to call attention to the mere question of the dates of the discovery of the several alleged defaults, for reasons which will be obvious presently.

The case came on to be heard before me and a special jury on May 5 last, when counsel for plaintiffs proceeded to open the case. It very soon became apparent that the case was one wholly unfitted for investigation by a jury, as it consisted of three claims for sums respectively of 2,130*l.*, 1,000*l.* and 880*l.* made up of numerous kinds of alleged deficiencies in multitudinous matters, said to have been improperly dealt with by the defendant, and requiring a protracted examination of plans and documents by a person having such knowledge as only architects and surveyors possess. The parties having desired my opinion as to the construction to be put upon clause 22 of the conditions, I intimated that I thought that the plaintiffs, in order to recover, would have to make out something in the nature of what is popularly known as "scamping the work" in order to entitle them to go behind the certificates given three or four years before action, and after some discussion the counsel agreed that it should be referred for inquiry and report to an architect to be chosen by me who should investigate and report to me on the claims in the action, and that upon his report I should direct judgment from which there should be no appeal, and deal with all costs; and an order was drawn up by consent to that effect. I appointed Mr. Henry Arthur Hunt, of 45 Parliament Street, architect and surveyor, to hear the case and report upon the questions raised by consent of the parties, which were as follows:—1. Was the defendant guilty of fraud in carrying out the contract? 2. Was the defendant guilty of scamping the work, with a view to his own interest? 3. Was the defendant guilty of wilful deviation from the contract in the sense of intentional and substantial departure from the contract, with a view to his own interest? 4. To what amount, if any, are the buildings the worse for the defects consequent on the defendant so being guilty of each of the three previously named breaches, if any, and (if not necessary to replace) what the defendant has saved by such breaches? Mr. Hunt, in pursuance of this order, held an inquiry, which lasted upwards of twenty days, and inspected the schools in question, so far as he deemed necessary, and heard counsel and witnesses for both sides, and eventually, on August 10 last, reported to me as will appear presently. The case was put in the paper for judgment on the last day of the sittings before the Long Vacation, but it was then agreed by both parties that the report raised questions which would require more discussion than the parties had contemplated, and that it would be better that it should stand over for discussion until after the Long Vacation. Accordingly, on October 31 the case came before me again, and after some further discussion it was agreed that I should, after going through the shorthand notes of all the proceedings before Mr. Hunt (which I have since done), and ascertaining from him his intentions as to the ambiguous expressions in his report, give judgment without further argument, unless I saw any reason for requiring further discussion. Having now had the opportunity of seeing Mr. Hunt and obtaining his view of the case, I see no reason for abstaining from giving judgment; but before stating the result at which I have arrived it will be right that I should state seriatim the result of the inquiries I addressed to Mr. Hunt as to the exact intentions of his mind in all cases in which the language of his report is at all ambiguous; and I may add that, having carefully gone through the shorthand notes of all the proceedings before him, I can see no reason to doubt that the conclusions he has arrived at, as now more fully reported to me, are the correct conclusions to be drawn from the evidence upon a correct view of the questions upon which the case turns.

The first finding is as follows:—"The defendant was not personally guilty of fraud, but to a small extent a plumber was guilty in laying light lead in the gutters to the amount of 7 cwt., of the value of 5*l.* 5*s.*" Mr. Hunt informs me that he was clearly of opinion, and indeed the learned counsel who conducted the case before him was obliged to admit that in no single case was there any reason to suppose that the defendant had any fraudulent intent. The finding with regard to the plumber's conduct was inserted by him in consequence of an argument that nevertheless the defendant might be responsible because the plumber who laid light lead to the extent of 5*l.* 5*s.* in the gutters was an agent for the defendant, and so the defendant was responsible for his fraud. He informs me, however, that this act of the plumber was known to no one else. I am not of opinion that it was the intention of clause 22 of the

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conditions that in such a case as this the Board should be entitled to go behind the architect's certificate at any time within the four years as contended for the plaintiffs. I do not think that the cases relating to liability for fraud of an agent apply to such a case, or that defendant, in the absence of personal fraud, can be rendered responsible, however fraudulent the conduct of the plumber may have been.

The second finding was as follows :—"I say that generally the work has been well done, notably the leadwork, the joiner-work, the plasterwork, the brick and stonework, and that although there are serious failures in the drainagework of at least one school, I do not consider that, as a whole, the work has been 'scamped.'" It is obvious that this finding is open to the objection that it does not answer the question put, but, after reading the shorthand notes and making full inquiry of the referee, he informs me that he considers the fair result of his minute inquiry to be this :—(1) That, looking at the work done under the three contracts as a whole, he is of opinion that it was well and conscientiously done ; (2) that as regards the drainage there were serious defects ; but (3) that these defects were not due to any desire on the part of the defendant to obtain any advantage for himself, nor on the part of any foreman employed upon the works to make the contract a more advantageous one for the defendant, but that such defects were due to the slovenly work of the persons actually engaged upon the work, which ought to have been objected to at the time by the plaintiffs' clerks of the works, who were not called as witnesses, and who seemed to him to have done their part in the most perfunctory manner. I may say that upon this part of the case there was a serious conflict of evidence between a witness named Keech and a foreman of defendant's named Spicer, as to which the referee felt himself unable to accept the version given by Keech, who was the plaintiffs' witness, as against that of Spicer, who was called by the defendant. But even assuming that there was some blame to be attached to the defendant's foreman in respect of the work done and the deviations from the contract, so far as the drains were concerned, I think the referee is right in the view he takes of the case, viz. that the defects in the drains cannot be ascribed to any desire on the part of the defendant, or anyone responsible to him, to put money into his pocket, but rather to a loose surveillance on the part of the plaintiffs' clerks of the works and to an erroneous notion thereby entertained by the defendant's workmen that what was being done was being done in exact accordance with the contract, or at most to a still more erroneous notion that it would be pleasing to the defendant if they did the work at less expense to him than if it were done in strict accordance with the contract.

As to the third question, I have had considerable difficulty in appreciating any distinction between its meaning and that of the second question ; but it is not necessary to discuss this question in the view I take of the findings, which were as follows :—"I say there have been substantial departures from the contract—(1) with the full cognizance of or to comply with the wishes or orders of the clerks of the works, which have doubtless put money in defendant's pocket, but should have been adjusted by the measuring surveyors in the usual way ; (2) there has been a departure in the width of the wall-gutters. Although it is difficult to ascertain from the drawings what the width should be, and the specification does not explicitly state the minimum width of a wall-gutter, still I am of opinion that about 20 cwt. of lead has been saved in two of the schools and 3 cwt. additional put into the third." Here, again, it was necessary that I should ascertain from the referee the full meaning of his findings, and upon inquiry as to these I find that what he intends to report, and I can see no reason for dissenting from his conclusions, is as follows :—1. That there are several cases in which work has been done in a way substantially different from that provided for in the contract and specification, and that in some of such cases the effect has been to put money into the pocket of the defendant, but that the work as actually done was either expressly sanctioned by the clerks of the works of the plaintiffs or done with their full cognizance, and that in other cases of such departure the defendant might have claimed an addition to the contract price which on adjustment after measuring the work might have been set off against the cases in which defendant had been the gainer by other departures, and that no such adjustment had taken place. 2. That in the case of the wall-gutters the contract had been departed from, but that, owing to the ambiguity of the specification and drawings applicable to each work, there was no reason to impute any unfair intention either to defendant or his foremen in consequence of such departure. The referee on inquiry reports to me that he did not intend to report that in either of the above cases there was, in his judgment, any intentional departure from the contract either by defendant or his men, with a view to either his or their own interests.

The answer to the fourth question put to the referee was as follows :—"I beg to state that with the exception of the drainage I do not consider that it is necessary to replace or take up and

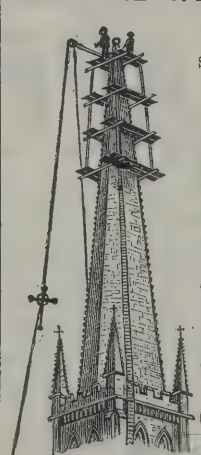
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restore any of the work, but I am of opinion that the defendant has saved by the abovenamed breaches the sum of 240*l.*, and to make good defects which have manifested themselves the sum of 175*l.* should be allowed." The answer of the referee to this question at first sight seems inconsistent with the last statement in relation to the answer to question (3), because it seems to be an answer which assumes a liability under one or other of the former answers; but he informs me that he did not intend by the use of the words "by the above-mentioned breaches" to adopt the words of the question "so being guilty of the three previously-named breaches" so as to find that there had been any breaches amounting to fraud, or scamping, or wilful deviation with a view to defendant's own interest, but only to assess the damages for deviation and defects in case the defendant should be held liable in spite of the admission that he was not guilty of any personal misconduct, of himself or by others for whom he was responsible, on the ground of such deviations having been established.

The last finding of the referee as to the time of discovery of defects becomes immaterial in the view I take of the whole case, but he has added two paragraphs to his report which are not in answer to any specific question. They are as follows:—"I have not especially reported on many of the claims in the particulars which I have not considered proved, neither do I mention the amount of work which the defendant did over and above the contract and for which he has not been paid, as I am of opinion that, as the defendant has not made any counterclaim he is not entitled to any set-off. In conclusion, I would beg leave to remark that the defects that have manifested themselves in the buildings could not have existed without the contributory negligence of the School Board and its agents."

In order to avoid misunderstanding I may as well state that I think he was fully entitled to take into consideration, when deciding such questions as the first three submitted to him, the fact that there were cases in which the defendant had done work beyond the requirements of the contract and made no claim for it, only as bearing upon the question whether he was actuated by a desire to put money into his pocket beyond what he was fairly entitled to, though he was right in not considering the liability of the defendant (if he was liable at all) as being entitled to be diminished by the amount of extra expense incurred by him in respect of such work beyond the requirements of the contract, no counterclaim having been pleaded. The last paragraph of the report might have been omitted, but it was inserted in consequence of the importance naturally attributed to a fact which is amply proved by the evidence which I have read through, viz. that throughout the work there was so much laxity in the attendance and surveillance of the work by the Board's clerks of the works that the workmen of the defendant were not controlled from committing errors, the very object of appointing clerks of the works being to prevent errors and rectify them during the progress of the works. On the whole I have no hesitation in giving judgment for the defendant with costs.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

Applications for Patents.

19372. Henry Albert Harris Dunsford, for "Improvements in windows."

19383. Arthur Lamplough, for "A new or improved sash-fastener."

19443. John Le Marchant Bishop, for "Improvements relating to the ventilation of dwelling-houses and other buildings."

19476. Thomas Smith, for "An improvement in hinged and jointed sash-weights."

19488. Thomas Coulthard, jun., and Richard Cottam, for "Improvements in door-locks having a combined night-latch and bolt."

19544. John William Barratt, for "Improvements in draught-preventers for doors and the like."

19559. Hugo Schneewind, for "A novel arrangement of door-closing mechanism."

19664. John Sanders Stevens and Charles George Major, for "Improvements in door-springs and checks."

19698. Arthur Jephson Bond, for "The direct-acting ventilator."

19740. George Jackson, for "Improvements in the mode of constructing concrete buildings."

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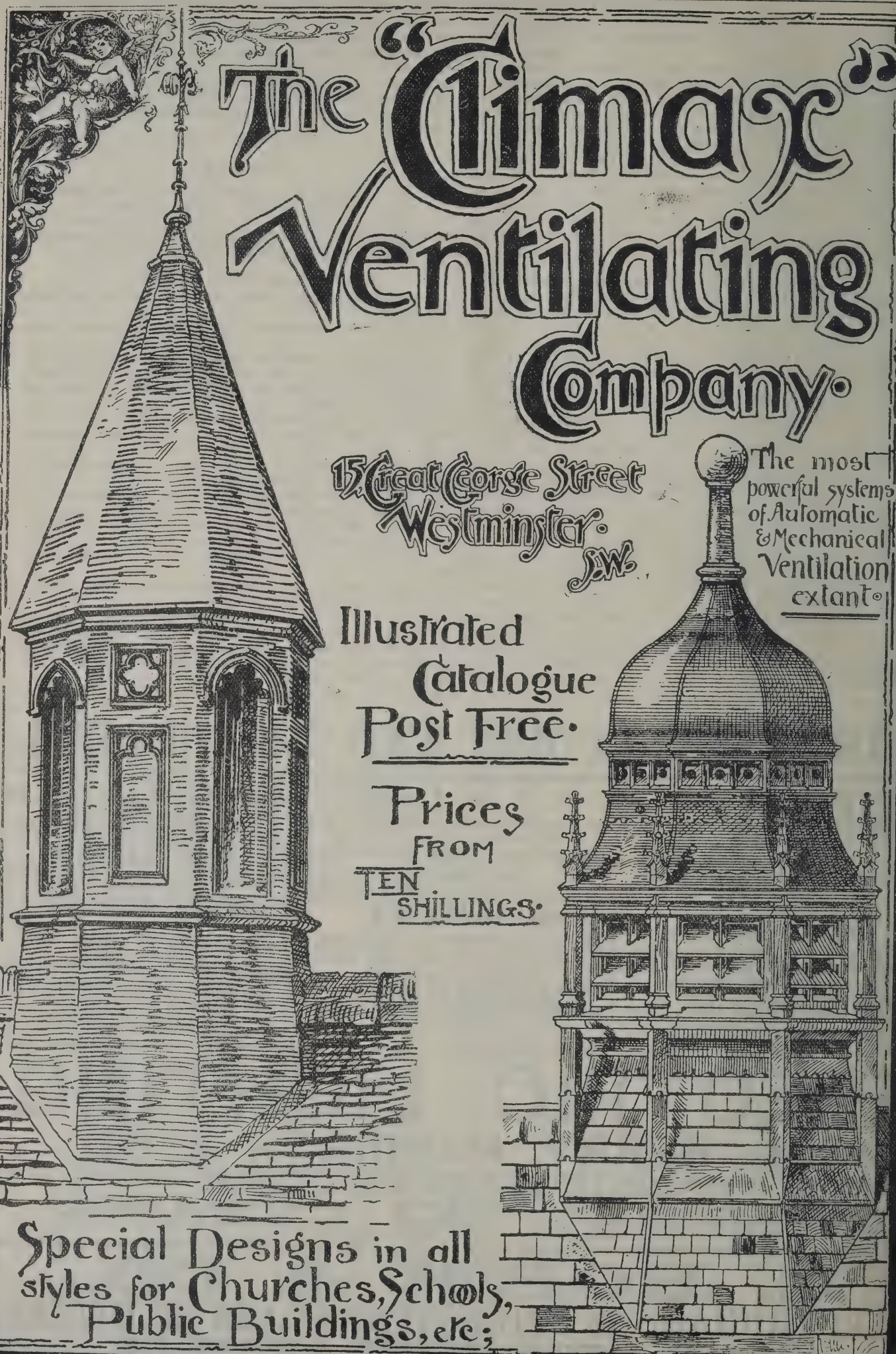
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to The Architect.

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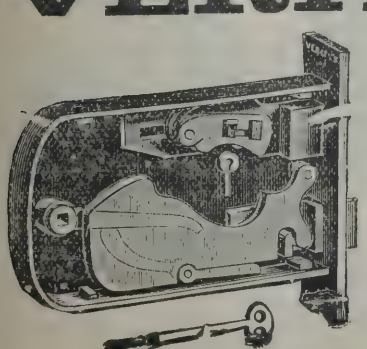
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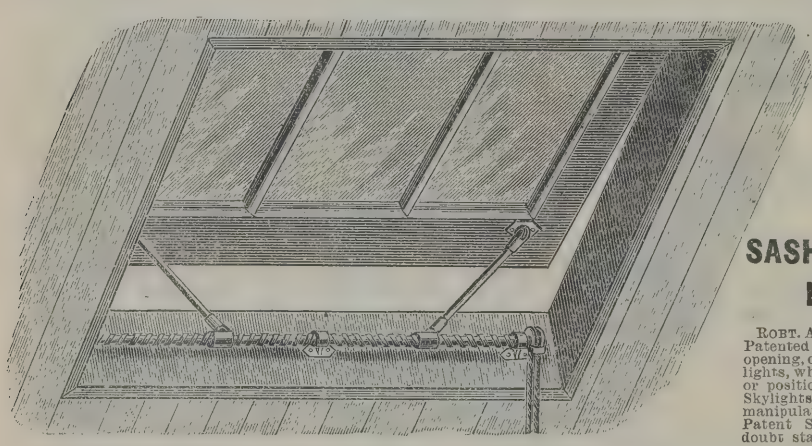
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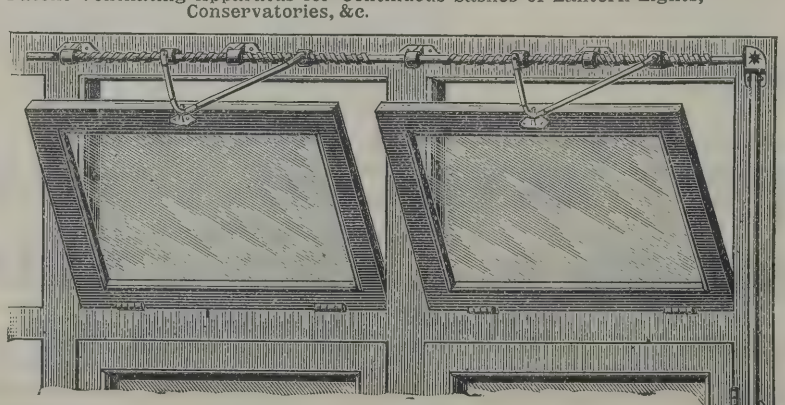


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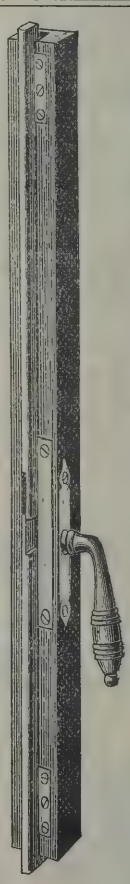
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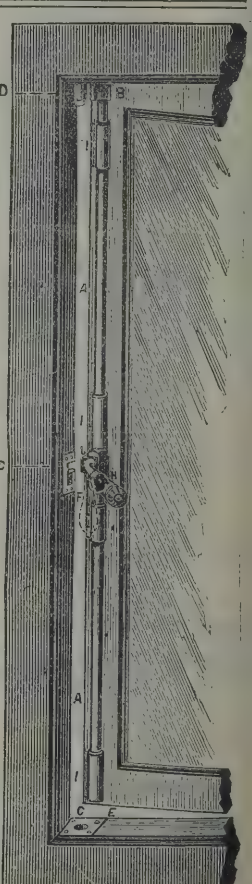




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For Building Sunday Schools at Cinderford. Mr. JOHN WILLS, Architect, Derby.

S. FREEMAN, Cinderford (*accepted*)	£1,190	0	0

FELIXSTOWE.

For Building Local Board Offices, Felixstowe. Mr. G. W. S. HORTON, Surveyor, Felixstowe.

Greenwood & Sons, Sudbury	£1,993	0	0
R. Girling, Ipswich	1,930	0	0
A. Ansell, Essex	1,888	0	0
W. Durrant, Felixstowe	1,695	0	0
O. Gibbons, Ipswich	1,690	0	0
D. Thurman, Felixstowe	1,678	9	7
H. RUNNACLES, Halstead (*accepted*)	1,670	0	0

FENNY STRATFORD.

For Building Baptist Chapel and Sunday Schools, Fenny Stratford. Mr. J. T. SLOAN, Architect, Linslade, Beds.

T. H. Coleman, Bedford	£2,418	0	0
G. E. Fathers, Bedford	2,050	0	0
French & Ellwood, Sandy, Beds.	2,060	0	0
John Grant, Grimsbury, near Banbury	2,798	0	0
S. Orchard & Son, Banbury	2,754	0	0
W. Wade, St. Neots, Hunts	2,117	0	0
H. W. Welsh, Fenny Stratford	2,225	0	0

Consideration deferred till December 8.

MELTON MOWBRAY.

For Building Chapel, Lodge, Laying Out Grounds, Making Roads, Drainage, &c., for New Cemetery, Melton Mowbray. Mr. CHAS. WM. SMITH, Architect, Grantham. Quantities by the Architect.

J. Hodson & Son, Nottingham	£3,200	0	0
G. Bell & Sons, Nottingham	2,977	0	0
S. Hipwell, Gorfield, near Wisbech	2,901	3	9
C. Baines, Newark	2,752	10	0
French & Ellwood, London	2,737	0	0
H. Hicks, Peterborough	2,710	0	0
G. Duxbury, Leicester	2,660	0	0
W. R. Girling, Wisbech	2,655	0	0
Hinson Bros., Stamford	2,650	0	0
J. Hutchinson & Son, Leicester	2,649	0	0
E. Bowman, Stamford	2,634	0	0
G. Priest, Grantham	2,630	0	0
H. S. & W. Close, North Lincoln	2,575	0	0
E. Clarke, Melton Mowbray	2,560	0	0
C. BARNE, Melton Mowbray (*accepted*)	2,480	0	0

PAIGNTON.

For Building First Portion of Residence, Polsham Park, for Mrs. G. S. Bridgeman. Mr. G. SOUDON BRIDGEMAN, V.P.S.A., Architect. Quantities not supplied.

Westlake	£599	10	0
C. & R. E. Drew	585	0	0
F. Webber	580	0	0
RABBICH & BROWN (*accepted*)	572	0	0
Architect's estimate	570	0	0

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KENDAL.

For Building a Villa Residence on Castle Haggs, Kendal. Mr. JOHN STALKER, M.S.A., Architect. Quantities by Architect.

J. W. Howie, excavating, walling, masonwork and slating.
Henry Collett, carpenter and joiner work.
William Jackson, plumbing, glazing, painting and hot-water fitting.
Benjamin Davis, plastering.

For Building a Covered-in Fives Court at the Bowling-Green Inn, Kendal, for Mr. Charles P. Banks. Mr. JOHN STALKER, M.S.A., Architect, Kendal.

William Dixon & Sons, excavating, walling and masonwork.
Henry Collett, carpenter and joiner work.
William Jackson, plumbing, glazing and painting.
Lyon & Nicholson, plastering, cementing and concreting.

NEWBRIDGE

For Building Cottages, Newbridge, Mon., for the Newbridge Building Club.

A. Richards, Newport	£3,856 0 0
C. F. Morgan, Newbridge	3,796 0 0
T. Williams, Newbridge	3,792 0 0
OSBORNE & CO., Aberdare (*accepted*)	3,360 0 0

PLYMOUTH.

For Building Stores, Stabling, &c., at Nos. 2 and 2½ Garden Street, Plymouth, for Mr. A. R. Anning. Mr. JAMES HARVEY, M.S.A., Architect, Bedford Chambers, Bedford Street, Plymouth.

Tozer & Son	£530 0 0
W. T. Bone	510 0 0
S. Roberts	500 0 0
A. N. COLES (*accepted*)	470 0 0

SLAITHWAITE.

For Building Local Board Offices, Slaithwaite, Yorks. Quantities by Architect.

England & Sons, Slaithwaite, mason & joiner.
Francis Goodall, Marsden, plumber & glazier.
Pickles Bros., Huddersfield, slater.
James Walker, Slaithwaite, plasterer and painter.
Calvert Bros., Huddersfield, warming apparatus.
Total, including cost of site, £1,500.

SUNDERLAND.

For Alterations to Property, 47 John Street, Sunderland. Mr. T. R. MILBURN, Architect. Quantities by Architect.

J. Armitage	£783 13 11
C. T. Humble	678 0 0
W. B. Cooper	556 17 8
W. Scott	550 0 0
J. Spain, jun.	544 0 0
M. Howarth	543 18 0
J. Elrick	540 0 0
J. & D. Rankin	535 10 0
T. P. Shaftoe	533 10 0
J. Huntley	498 13 0
J. HUDSON (*accepted*)	496 10 0

SWINDON.

For Building Commercial and Dining Rooms and Six Bedrooms at Rear of the Cups Temperance Hotel, 92 Regent Street, New Swindon. Mr. R. J. BESWICK, Architect.

H. C. Cook, New Swindon £258 0 0

For Building Shop and Dwelling-house, Faringdon Street, for Mr. W. G. Little. Mr. R. J. BESWICK, Architect.

THOMAS BARRETT, Old Swindon (*accepted*) . £1,056 0 0

For Building Sunday-school, Stratton, for the Primitive Methodists. Mr. R. J. BESWICK, Architect.

THOMAS COLBORNE, Stratton, near Swindon (*accepted*).

For Building Workman's Club, Old Swindon. Mr. R. J. BESWICK, Architect.

W. H. FORD, Swindon (*accepted*) . . . £405 0 0

TENBY.

For Building Roman Catholic Church, Tenby, South Wales.

		If Monk's Park Stone.
Estcourt, Gloucester	£4,280 0 0	£3,945 0 0
E. T. Hatherley, Bristol	3,500 0 0	2,987 0 0
Stephens, Bastow & Co., Bristol	3,479 0 0	3,099 0 0
T. Collins, Tewkesbury	3,450 0 0	3,160 0 0
Cowlin & Sons, Bristol	3,069 0 0	2,719 0 0
G. Richards, Tenby	2,948 0 0	2,530 0 0
Davies & Son, Tenby	2,792 0 0	2,652 0 0

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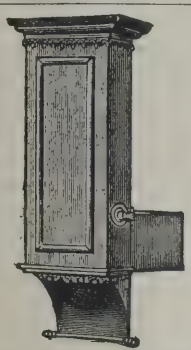
(Rd. Design.)

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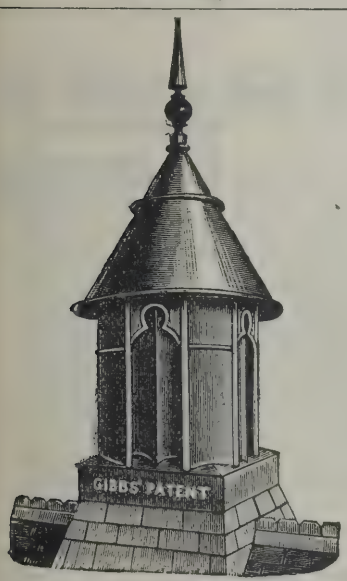
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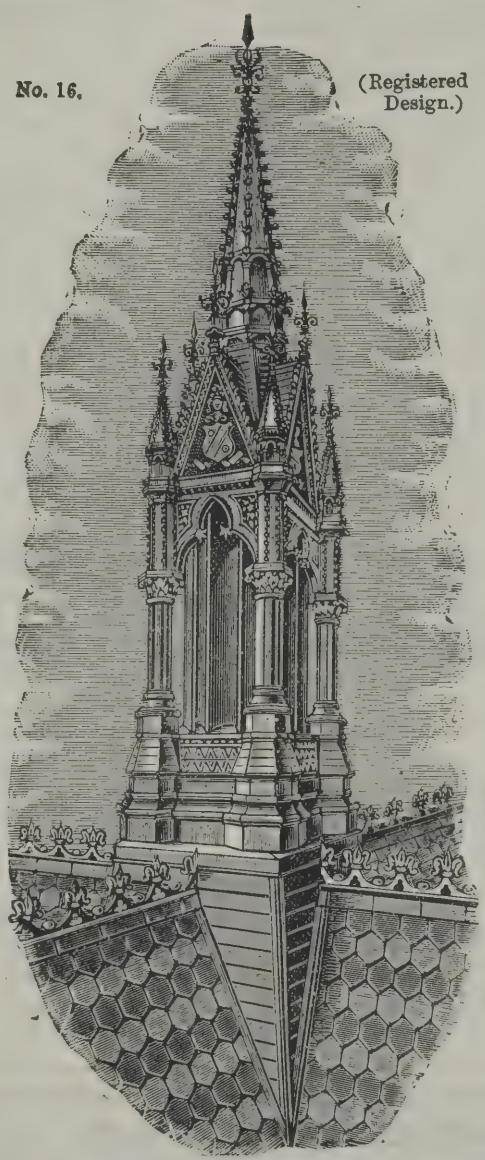


No. 7 (Inlet).
ORNAMENTAL BRACKET PATTERN.



No. 3 (Registered Design).
GIBBS' PATENT WEATHERPROOF EXTRACTOR.

No. 16. (Registered Design.)



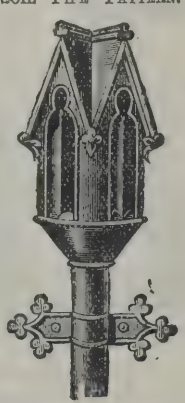
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No. 4 (Circular Front).
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,,	14	,,	.....	5 to 7 ,, ..	1	17	6	,,	24	,,	.....	9 to 12 ,, ..	5	5	0	,,	42	,,	.....	16 to 20 ,, ..	11	17	6
,,	16	,,	.....	6 to 8 ,, ..	2	12	6	,,	27	,,	.....	12 to 14 ,, ..	6	7	6	,,	48	,,	.....	18 to 24 ,, ..	16	15	0
,,	18	,,	.....	7 to 9 ,, ..	3	5	0	,,	30	,,	.....	13 to 15 ,, ..	7	10	0	,,	54	,,	.....	20 to 27 ,, ..	19	0	0

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TRADE NOTES.

Mr. JOHN GRUNDY, of Duncan Terrace, London, and Tyldesley, near Manchester, is supplying his patent warm-air ventilating grates to Wilbury, Salisbury, the seat of Sir Henry Malet, Bart.

THE new mission-room, Longport, near Burslem, is being warmed and ventilated throughout by means of Shorland's patent Manchester stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

THE ventilation of Chadwell St. Mary's Board Schools, Tilbury, has been entrusted to Messrs. Baird, Thompson & Co., ventilating engineers, London and Glasgow, who are introducing their latest improved patent exhaust roof ventilators for the extraction of the vitiated air.

THE Glasgow Town Council Electric Lighting Committee have made arrangements for the purchase of a site for the erection of buildings in which to place the electric plant for lighting the central area of Glasgow. The ground is situated in Bishop Street, Andorston, and the price to be paid is 8,000*l.*

WORKS of improvement have been carried out at the premises of Mr. Newman, wine merchant, Shrewsbury. In place of the narrow and inconvenient old smoke-room, a spacious and lofty room has been provided. The ventilation of this room is perfect, and it is lighted by a handsome Wenham gas pendant. The room is newly-fitted up. The floor of the public bar has also been lowered to the street level and the premises generally made convenient for the large and increasing business. The work has been carried out by Mr. Henry Price, builder, Shrewsbury.

AT a special meeting of the St. Helens Water Committee, the tender of Messrs. Oakes & Co., of Alfreton, Derbyshire, was accepted for the supply of 5,400 yards of 6-inch pipes for a new water main between Sutton and Brown Edge. The question of the acceptance of tenders for the plant for the purifying process was not settled.

A COMPANY is being formed for the purpose of constructing a pier at Rhos Fynach, near Colwyn Bay. Powers are asked in the draft provisional order to construct on the pier pavilions, aquaria shops, reading and refreshment-rooms, swimming-baths, &c. The pier will be about 500 yards in length, and will be suitable for the landing of passengers and goods from steamboats, &c.

THE London County Council have approved of the following recommendations:—That the sanction of the Council be given under seal to the borrowing by the vestry of St. Pancras of the sum of 60,000*l.* towards defraying the cost of certain electric lighting works, at a rate of interest not exceeding 4*l.* per cent. per annum, and the principal being repaid by equal annual instalments within a period of forty-two years from the date of the loan. That the Council apply to Parliament for power to make advances for electric lighting purposes to vestries and other rating authorities within the county of London, for periods not exceeding 60 years, and that it be referred to the Parliamentary Committee to take steps to obtain the necessary statutory authority for that purpose.

VARIETIES.

AT the meeting of the Salford Town Council Mr. Alderman Mottram inquired whether the Mayor would call an early meeting of the General Purposes Committee to consider the desirability of erecting a new Town Hall upon the present or some other approved site, more suitable to the requirements of the borough, as the present building was not sufficiently commodious for the efficient carrying on of the municipal business. The Mayor said he intended to bring that matter forward early in the new year.

THE building of hotels at Monte Carlo has been carried to such an extent during the past few years that the Prince of Monaco has now put his foot down, and issued an irrevocable edict that no more are to be erected for some time to come.

A PORTION of the clerestory of the beautiful old church of All Saints, Barrington, Cambridgeshire, has just fallen with a crash on to the roof of the south-east aisle. The edifice is in many parts in a dilapidated condition and requires restoration.

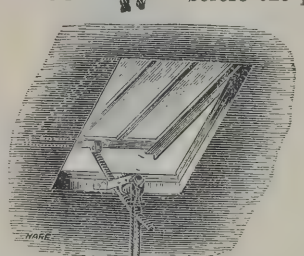
PLANS have been prepared for the construction of a new railway bridge across the Thames at Bourne End, Marlow, in

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place of the present unsightly structure. If approved, the work will be commenced about next Easter. The proposed bridge will be built on brick piers, and will be wide enough to accommodate a double line of rails. The estimated cost is 6,000*l.*

THE Newbury Town Council have received from Mr. Baldwin Latham his report in reference to the proposals for the sewerage of the borough, concerning which he was recently engaged to advise.

THE threatened water famine in New York has become very serious. The water in the reservoirs is very low, and little is coming into them. The daily consumption has been cut down from 165 million gallons to 100 millions. It is feared that the water in the Central Park reservoir, kept to fall back upon in case of fire, will have to be drawn upon if rain does not quickly fall. The police have difficulty in preventing the inhabitants from using the water wastefully, and washing of side-walks and windows with hose is forbidden. All public drinking-fountains and troughs have been closed. The engineers of the water-works are very anxious.

THE Royal Commission on the Chicago Exhibition are informed that the contract labour laws of the United States will not prevent exhibitors from importing foreign labour, or from entering into binding contracts with their employés.

AT the meeting of the Glasgow Dean of Guild Court the petition of Messrs. Stewart & McDonald for sanction to erect a gangway across Mitchell Street, connecting the two portions of their warehouses was refused, and the petitioners found liable in expenses.

MRS. J. T. HIBBERT has intimated her intention of building a new church at Field Broughton, Grange-over-Sands, at a cost of 3,000*l.* She will also give the site.

THE destruction of the old Elizabethan mansion at Bourn, Lincolnshire, in which, tradition says, the Guy Fawkes conspiracy was hatched, has been decided upon. The old Red Hall, as it is called, was for a century or so the home of the Digby family. A new railway is being made by the Great Northern Railway Company from Bourn to Saxby, and the mansion stands in the way. A large number of influential residents in Lincolnshire have united with the Society for the Protection of Ancient Buildings in petitioning the company to divert their line and spare the building.

THE great importance of sanitation with regard to building-construction has induced the Worshipful Company of Carpenters, in conjunction with the Sanitary Institute, to establish examinations in sanitary subjects. These examinations are intended to be suitable for clerks of works, builder's foremen, and others who have to deal with the construction of buildings. For the benefit of candidates who propose to attend the examinations, a course of nine lectures has been arranged, and will be given at the Carpenters' Hall during the months preceding the examinations. The Carpenters' Company have for some years past carried on examinations in carpentry, and the Sanitary Institute's examinations for inspectors of nuisances are also very well known. There is no doubt therefore that these joint examinations, dealing with the practical and sanitary requirements in connection with the building trade, will become very popular.

THE *Staffordshire Advertiser* says:—Considerable difficulty was experienced in discovering the exact situation of the old town well, Brewood, which it was necessary to find in order to commence preparations for the erection of the memorial to the late Major John E. Monckton. The well has been closed over half a century, and, although some of the oldest inhabitants were consulted, no one could tell exactly where it was situated. Many of the inhabitants took a great interest in the matter. It was discovered nearly in the centre of the Market Place, and when opened was found to be in a good state of preservation. It was about 54 feet deep, and contained about 14 feet of water. It may interest Brewood readers to know that about eighty years ago an old market cross stood near this well. On the coming of age of Mr. Thomas William Giffard, "the twentieth lord of Chillington," in 1810, some men were bringing a waggon of coal into the market-place to roast an ox in commemoration of the event. The waggon either shook down or knocked down the old cross, and it was never restored.

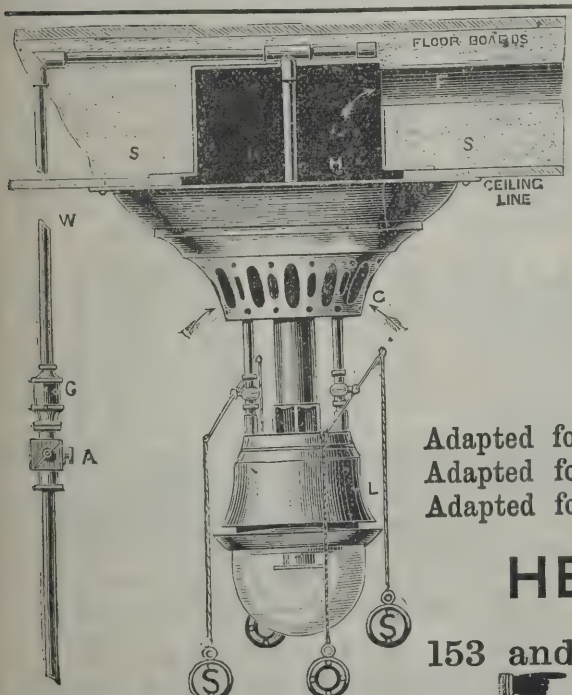
AT a meeting of the Llangefni Local Board, held on Friday, November 27, it was resolved to instruct Mr. Charles H. Beloe, M.Inst.C.E., of Liverpool and Westminster, to proceed with the details of the plans necessary for the sewerage and water-supply of this place, and to open negotiations with the landowners for the purchase of the lands required, forthwith. Mr. Beloe's designs were selected by the Local Board out of the six sets of plans submitted to them by engineers in various parts of the kingdom. The town of Llangefni is rapidly increasing in importance, and new offices are about to be erected there for the County Council, together with other public buildings, and it soon will be in fact, if not in title, the capital of Anglesey. It was therefore quite time that an efficient scheme of sewerage and water-supply should be provided for the town.

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IN a private Bill promoted by the London County Council it is proposed either to purchase Lincoln's Inn Fields Gardens for public recreation compulsorily, or to transfer the rights of the existing trustees to the London County Council. These trustees were originally appointed in the reign of George II., when an Act was obtained to enclose these gardens, which comprise seven acres, and to vest them in twenty-one trustees, who were empowered to levy a rate for their maintenance upon the proprietors and inhabitants of the surrounding houses. The vacancies in the Board of Trustees are still filled from among those upon whom the rate is leviable.

"A ROYAL DIVORCE," Mr. W. G. Wills's historical drama, is still one of the biggest successes in London, the New Olympic Theatre being nightly filled to its utmost extent. So popular has this play become that in order to meet the growing demand for seats an extra *matinée* is now being given on Saturday in addition to those on Monday and Wednesday.

CHICAGO EXHIBITION NOTES.

THE Council of the American Society of Mechanical Engineers has appointed a committee to devise and recommend a series of efficiency tests of engineering appliances. On this committee are Chas. E. Emery, who was in charge of the steam boiler tests at the Centennial Exposition, and Professor R. H. Thurston, of Cornell University, who was a commissioner to the Vienna Exposition of 1873, and a member of the jury of the Paris Exposition of 1889.

W. A. ALEXANDER & LOUIS GELDER, representing the insurance associations of Chicago, have asked for space, 50 by 100 feet, to construct a building at the Fair to constitute an exhibit of the most improved methods of fireproof construction and the appliances used in saving goods from burning buildings. The building, it is urged, can be occupied by a salvage corps during the Fair.

THE Illinois Board of World's Fair Commissioners has ordered specifications for the architectural reproduction in drawings of all the Illinois State institutions and public buildings, sixteen in number.

WILLIAM ORDWAY PATRIDGE, the great sculptor, has asked for space in the Art Palace for his statue of Shakespeare, which he is now making for Lincoln Park. His statue of Alexander Hamilton, which he is making for the city of Boston, will also be shown. Mr. Patridge is vice-president of the American Artists' Association in Paris.

MR. SELL, the London advertising agent, has applied for space to exhibit specimens of all the leading newspapers of the world which have been printed during the last two centuries.

THERE will be a model hospital in the Women's Building separate and distinct from the official hospital of the Exposition, of which Dr. Owen is director, being rather in the nature of an exhibit. It will, however, be fully equipped with physicians and trained nurses, a veritable model hospital, prepared to handle the gravest cases of accident or illness.

MR. TAKAHIRA, Japanese Consul-General in New York, who was specially commissioned by the Mikado to look into Exposition matters, has made a formal application to Director-General Davis for 124,100 square feet in the several buildings and on the Midway Plaisance as follows:—For an official Japanese building, 40,000 square feet; in the Manufacturers' Building, 35,000; Agricultural Building, 4,000; Fine Arts, 2,000; Mines and Mining, 750; Forestry, 350; Bazaars, 42,000.

THE Exposition attractions in the vicinity of the main lagoon entrance, just south of the great Manufactures Building, are to be quite different from those originally planned. No Casino will stand at the end of the pier 1,000 feet from shore, and there will not be a curved mole bearing columns emblematical of the thirteen States. In place of the latter there will be a peristyle, 60 feet wide and 500 feet long, extending north and south and spanning the lagoon entrance by a grand arch. Ranged along this peristyle will be emblematic columns representing all of the states and territories. At the north end of the peristyle will be placed the Music Hall, which for a time it was thought would have to be put on the wooded island. It will measure 140 by 200 feet, and will have an auditorium large enough to seat 2,000 people with an orchestra of 75 pieces and a chorus of 300 persons. It will also have a rehearsal hall 50 by 80 feet, capable of seating 600 people.

THE grand choruses and band concerts—the popular musical entertainments—will be held in an amphitheatre accommodating 15,000 people or more. This will be in the extreme southern part of the park, and after the close of the projected musical programme will be transformed into a live-stock show-ring.

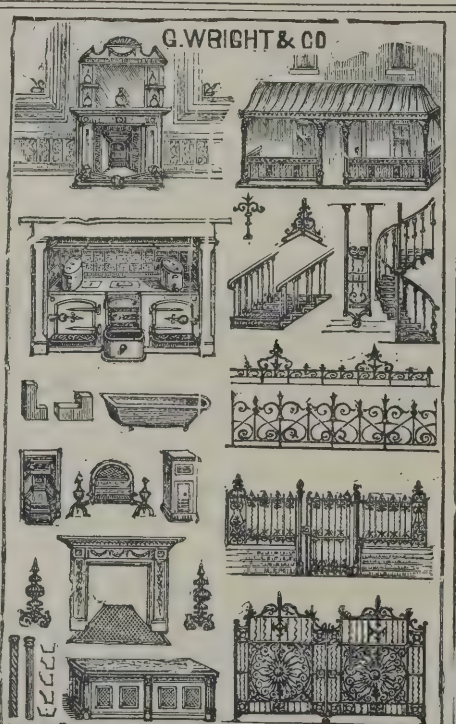
AT the south end of the peristyle there will be a restaurant and café, of the same size and style as Music Hall. This will be constructed to supply the main features of the abandoned

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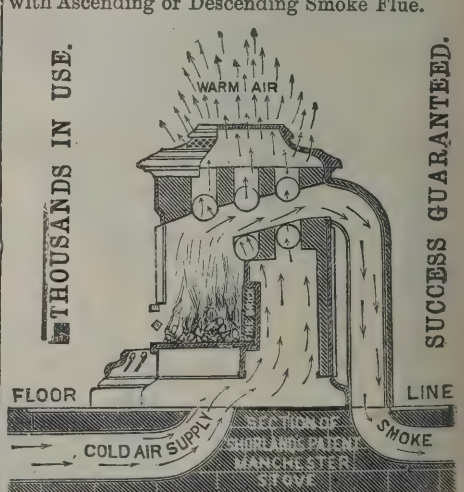
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Casino. The plans for these changes, which have been adopted by the ground and buildings committee, were made by Designer-in-chief Atwood, of the Construction Bureau. The estimated cost is 206,000 dols., or 1,000 dols. less than would be necessary to carry out the plans which were abandoned.

THE pier, extending 1,000 feet into the lake, is already completed. At its extremity, in place of the Casino, will be erected a tower 250 feet high. This will be of iron, covered with staff, and will resemble a lighthouse in appearance. From its summit electrical displays of exceeding brilliancy will be made, and by means of electric "search-lights" the grounds, or any particular portion of them, can be flooded with light on fête nights.

THE TIMBER TRADE OF HONDURAS.

THE Bureau of American Republics in Washington has received information in regard to the timber industry of Honduras. The first wood-cutters in the territory went to Belize 150 years ago, taking with them their slaves and their cattle, and since that time Belize has been principally occupied with the various camps or mahogany works, which extend between the rivers Ulua, Chameleon, Patteck and Wanks, on the Atlantic coast. The timbers at present most sought after for shipment are mahogany, cedar, rosewood, zebra and fustic. Mahogany and cedar are the trading exports, and are shipped mainly to England, although some contracts have recently been taken in the United States. The price of mahogany in London ranges from 110 dols. to 175 dols. per 1,000 superficial feet, and cedar from 90 dols. to 180 dols. Rosewood, zebra and fustic are cut into short lengths and shipped as ballast. Rosewood brings from 25 dols. to 40 dols. and fustic 30 dols. to 40 dols. The logs are squared before shipment. The timber on Government land is free to anyone who proves to the Administrator of Customs that he has ample means to transport it to market, a great deal having been lost before the adoption of this rule through the timber being left to decay after being felled. It can be cut at any time of the year, but the best season is during the rainy months, so that the logs may be ready by the beginning of the dry season, on March 1. The camp is generally composed of from twenty to fifty men, who are divided into companies, each having a captain. A foreman, in charge of the whole camp, keeps account of logs cut and other details. One man, called the hunter, looks up the trees fit to be cut and reports to the foreman, who examines each one. Care is taken not to fell any trees less than 8 feet in circumference. The cutting is done by piecework, two trees from 8 feet to 12 feet being a day's work for one man, and a tree 25 feet in circumference being regarded as a day's work for four men. Over 300 trees are sometimes felled in a camp in a single season. The carriage of lengths to the river banks is done principally at night. A foreman's wages will vary from 60 dols. to 100 a month, with occasional allowance of an extra servant; first captain 18 dols. to 20 dols. a month, with rations, and choppers 10 dols. to 14 dols. a month, with rations. The export duties on mahogany and cedar are 8 dols. per 1,000 superficial feet.

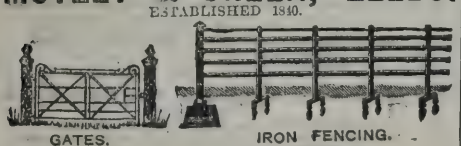
THE KRASNAPOLSKY RESTAURANT AND WINTER GARDEN.

A WONDERFUL transformation has lately been effected in connection with the premises of the above institution, situated in Oxford Street, which will be reopened to the public on Monday next, and one that is calculated to cause considerable interest, not only among the *jeunesse dorée*, but also the more staid portion of the community, inasmuch as no expense has evidently been spared, conducive to elegance and luxuriousness, and if, as has been insinuated, we English continue to take our pleasures sadly, no fault can attach to the promoters of this particular festive resort, the title of which is derived from its managing director, Mynheer Krasnapolsky, who has gained a wide reputation at Amsterdam and other Continental towns as a successful *restaurateur*, while the other directors include Mynheer Maas, the Netherlands consul, and Mr. Cecil Gladstone. The secretary is Mr. J. Davis, through the courtesy of whom we were privileged to make a private tour of inspection some days ago.

In regard to the external portion of the building facing Oxford Street there is little to be said beyond what may be fairly commendatory, although an important improvement is to be effected as soon as the permission of the authorities has been obtained in regard to the construction of a covered way right up to the curb-stone. After entering the portal, where some artistic oak woodwork meets the eye, we enter the capacious and lofty Winter Garden, abounding with palms and various other plants, and our attention is drawn to the elegantly-designed mosaic which has been executed by Messrs. Diespecker, of Holborn. There is also a fountain here and other adornments. In the gallery above,

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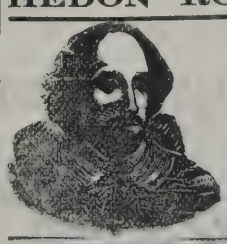
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access to which is gained by means of two staircases, is a handsomely-fitted-up restaurant, while the abundance of surrounding mirrors will doubtless serve to reflect many a gay and festive scene. A beautifully-executed white marble fountain will be observed in the gallery, where there is also a buffet and a recess, which latter may serve for a reading-room or other purpose. The large central dome above is fitted with a sliding roof, and all the ironwork in connection therewith has been executed by the St. Pancras Ironworks Company, and incidentally it may be mentioned that the decorative ironwork throughout the building has been executed by Mr. P. Schryvers, of Brussels. Adjoining the before-mentioned restaurant are the capacious kitchens, to which new lifts have been affixed by Messrs. Smith & Stevens.

Proceeding to the second floor, we enter the magnificent banquet-room, which has been superbly decorated, and abounds with fine oak carving. Adjoining thereto are two other dining-rooms of less dimensions, which have a comfortable and cozy appearance. These rooms are eminently adapted for the entertainment of Masonic lodges as well as private parties.

Descending to the basement, a very fine and luxurious billiard-room is discovered, in which six tables by Burroughs & Watts will be placed, so that the votaries of the game, whose name is legion, can indulge therein to their hearts' content. The dado work here has been executed by Messrs. J. Aird & Sons, who take credit also for the marble steps leading to the billiard-room, while the painting was done by Michael Hendricks, of Amsterdam. Adjoining is a large vacant space right under the winter garden, which can be utilised at any future time for such purposes as may be desired. The wine cellars, whose capacity as may be well imagined is enormous, will be found in close proximity. But we hasten to enter the boiler and engine-rooms, which are also of course in the basement, and which are fitted in a manner that cannot fail to awaken admiration. For here will be found two 30 horse-power boilers by Robey & Son, and two 20 horse-power by Ruston, Proctor & Co., together with three engines of 30 horse-power each, also by Ruston, Proctor & Co., and all, as may be supposed, of first-class quality. In close proximity are three dynamos and switch-boards, which have been supplied by Messrs. Crompton. It may be added that no vibration is experienced there, thanks to the lead and cocoanut matting which have been laid down. The work in this department has been ably carried out under the superintendence of Mr. Hartmann, the consulting engineer.

Abundant and well-fitted lavatories exist in the building, and there is a lift from the ground floor to the top that will admirably serve the intended purpose.

It only remains to add that the capacious building is fitted throughout internally and externally in the best possible style, and to Messrs. Wenham & Waters' credit is due not only for the electric wiring and fittings, but also for the heating and plumbing which has been done by them right throughout. The builders, it may be mentioned, are Messrs. Higgs & Hill, who have done all the rough construction and woodwork. The elegant decoration and the plasterwork in connection with the banqueting and adjoining dining-rooms have been executed by Mr. Allan Chambon, of Brussels. The architect over all was Mr. J. Springer, of Amsterdam, whose representative on the work was Mr. J. A. Van Voorthuysen, and they are to be complimented for the general excellence of the whole work, both in the design and internal decoration.

Brief and imperfect as is this descriptive notice, it may yet serve to give some idea of an institution which seems likely to be a centre of attraction, and to have a prosperous career before it, having regard to the elaborate manner in which the directors have gone to work, who, if they do not command success, at least thoroughly deserve it.

THE FORTH BRIDGE.

THE contractors for the Forth Bridge, Messrs. Tancred, Arrol & Co., have not done with the actions against them. Judgment has just been delivered on another taken by the Steel Company of Scotland, Limited, to recover 50,000*l.* damages for alleged breach of contract in connection with the supply of steel for the construction of the Forth Bridge. By an offer and acceptance dated February and March 1883, the company offered to supply and the contractors agreed to purchase the whole of the steel required by the defenders for the Forth Bridge, less 12,000 tons of plates. In 1887 a dispute arose as to the defenders obtaining steel beyond 12,000 tons from other sources, and an action was raised in the Court of Session to determine the question. While the question of liability was being decided the defenders admitted having purchased 5,000 tons more than they were entitled to from other sources, and decree was given against them for 14,580*l.* After considerable procedure the House of Lords found that the contractors were bound to take from the pursuers all the steel

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required for the superstructure of the four main spans of the bridge. The pursuers now claim 50,000*l.* in respect of other 14,000 tons of steel which they aver defenders obtained from other sources. They explain that this sum they would have made in profit in consequence of the great fall in price of steel after the contract was entered into. The defenders deny that they are due any sum in addition to the 14,580*l.* already paid.

Lord Kyllachy, in giving judgment, said he had to fix the quantity of steel on which the pursuers were entitled to have their damage calculated. He understood that that quantity being found, the parties were in a position to adjust the figures. The conclusion he had come to on the evidence was that it was impossible to fix absolutely the quantity of steel used or the waste. In the circumstances he did not think that anything else could have been expected, and the result was that to some extent he had found it necessary to deal with the matter roundly. That being so, the result was that he had found the total quantity of steel which the contractors required to order for the part of the work in question was 55,000 tons. In reaching that figure he had had to make up his mind on one or two points which might perhaps be called points of principle. First, he had found it impossible to proceed on the statement on which the pursuers' accountants had based their calculations. He thought the evidence was conclusive that that statement showed simply the quantity of steel ordered, and did not show, or profess to show, the ultimate destination of each quantity. Second, he had accordingly been obliged to have recourse to the method of computation adopted by Sir Benjamin Baker, and to find out the quantity of steel actually in the main spans or brought out in the engineers' calculations, and the quantity wasted or reduced to scrap in the course of the work. As to the first of those figures, he had, so far, not had much difficulty. He had no reason to doubt the accuracy of the measurements made from time to time by the engineers. Assuming, therefore, that the plates supplied were of the average thickness ordered, the quantity of steel in the superstructure of the main spans was, including rivets and ladders, 50,958 tons, or, excluding castings, 50,691 tons. But the questions to be considered were, first, What allowance fell to be made for waste? and second, What allowance fell to be made for what in the proof was called rolling margin—that was, a certain excess of weight beyond the weight ordered, due to the pursuers' anxiety to err within the contract margin rather by excess of thickness than by defect? Excluding rivets, &c., there appeared to have been supplied to the bridge, including steel for temporary work, in round numbers 57,000 tons. That being so, if there were only now 50,958 tons in the bridge, there must have been a waste between the main spans and the temporary work of over 7,000 tons. Making the fullest deduction for the waste applicable to the steel used in the temporary work, and not turned to account in the permanent structure, the discrepancy between the quantity supplied and the quantity found in the main spans was yet a good deal larger, as it seemed to him, than the defenders' figures allowed for. On the whole, he did not think he should do either party injustice if he added, in respect of excess of thickness of plates, and excess of waste beyond Sir Benjamin Baker's allowance, a lump allowance of 800 tons, making up the total weight to be dealt with to 55,000 tons, in place of 54,000 tons, as brought out by Sir Benjamin Baker. He had included the rivets in the above figures, because he thought the rivet steel fell within the contract. The only question remaining was whether the contract was modified to the effect of discharging the part of the defenders' obligation. On that question, if it were open, he should, he confessed, have had difficulty in deciding against the defenders. His impression was that there was in that matter a concluded verbal agreement, followed up by *rei interventus*, to the effect that the defenders might get their rivets where they pleased. But he did not think the question was open. The question was fairly raised by the conclusions of the summons in the former action. In the former action he thought it would have been competent and relevant to the defenders to plead that the rivets contract had been discharged, but no such plea was taken, and accordingly the judgment of the Court, affirmed by the House of Lords, was expressed in unqualified terms affirming that the defenders were bound over to take the whole of the steel from the pursuers. On the whole, therefore, he should find that the quantity on which damage was to be calculated was 55,000 tons, that was 43,383 tons and the 12,000 odd tons, which were supplied by the Landore Steel Company. Deducting these from the 43,383 tons, the 31,000 odd tons dealt with in the former action, there remained 11,617 tons, which was the quantity he fixed upon which damage would have to be paid. With respect to interest, he did not see any reason why it should be high, and he thought 4 per cent. would be sufficient. He supposed the parties would adjust the amount upon the quantity which he had determined and report to him the amount, for which he would give decree.

Counsel agreed to do so, and the case was adjourned for that purpose.

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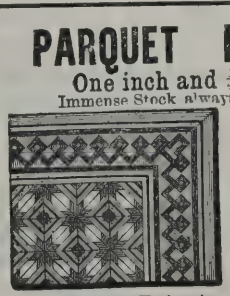
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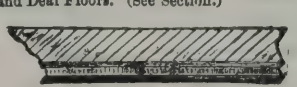
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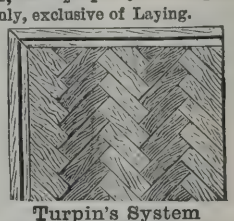
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THE ANTECEDENTS OF GOTHIC ARCHITECTURE.*

I SUPPOSE that while we all recognise the fact that architecture is something more than constructive building, we equally maintain that it is always based upon constructive principles, and that these constructive principles are what primarily determine the respective characters of architectural styles. I conceive that in broadest classification there have existed in the world thus far but three fundamentally differentiated architectural systems—the trabeate, the inert arched and the balanced, or, to name them from their leading types, the Greek, the Roman and the Gothic. The numberless varieties of styles which have taken shape during the historic progress of the art are but so many modified forms of one or the other of these main groups.

By Gothic architecture I understand then, primarily, an architecture which is distinguished by a balanced system of construction, a system in which the side-thrusts of vaults and arches are met by well-adjusted props or braces rather than by inert masonry. And it is clear that an architecture based on such a system admits of, and logically demands, a degree of slenderness in its supporting members which would be insecure in architecture based on any other system.

It follows that among the distinguishing characteristics of Gothic construction are comparative lightness of supports and consequent large extent of openings between them. Therefore, before we can properly call a building Gothic, we must find these characteristics either developed or in process of development.

In forming the Gothic style the exigencies of the system were yet incompletely apprehended by the builders, and consequently the ultimate principles were not fully carried out. But in all transitional monuments, rightly so-called, the animating spirit of the system may be seen to be working, and tending to modify structural forms in the Gothic direction. The principal incipient forms are those of the vaulting, and it is not until these are considerably developed that the lower supports are wholly transformed and brought into agreement.

The principles which mainly governed the Gothic vault transformation are those of diminution and concentration of pressures. And it is, I think, because the exigencies of this last have not been fully recognised that so much misunderstanding of Gothic art prevailed. Our conceptions of Gothic have been so largely influenced by the belief that it is mainly characterised by the use of the pointed arch, that this more essential principle has been largely overlooked.

It was this necessity for concentration of thrusts that first led to the use of groin-ribs (for the groins of ordinary cross-vaults do not need supports where their thrusts are amply met by strength of walls or of massive piers), and it was this necessity which gave to Gothic vaulting that peculiar form which has puzzled so many students of architecture, who have not primarily regarded structural principles in their examinations and classifications of styles. I refer to that twisted conformation of the lateral cells of the vault which results from the stilting of the longitudinal rib. It is by means of this elevation of the springing of the end ribs of these lateral cells that the completest possible concentration of the vault-thrusts against the narrow pier is effected, and the full efficiency of the flying buttress is secured.

Now I think I am justified in saying that this is the most fundamental peculiarity of Gothic building, for everything else that distinguishes the system results from it. This balanced system being, then, what fundamentally distinguishes the Gothic style, let us now consider what were its antecedents, what class of earlier buildings really contained the germs of Gothic. It is commonly said that the Gothic was developed out of the Romanesque, though this development has been largely regarded as ornamental. The transition has been traced by nearly all writers, from De Caumont to Sharpe, through mouldings, pointed arches and other small features, while but a few writers—I believe only Viollet-le-Duc and Quicherat—have recognised that it is essentially structural.

It is true that structurally the Gothic is an evolution out of the Romanesque. But the term "Romanesque" has, perhaps, the widest meaning of any that is used in connection with architecture. In utmost strictness the Romanesque is not a style. It is an architecture of transition. Quicherat defines it as that which has ceased to be Roman and has not yet become Gothic. With slight modification this is a good definition. The modification that I should make would be to insert the word strictly before Roman, so that the definition would be :—"Romanesque architecture is that which has ceased to be strictly Roman and has not yet become Gothic." For the

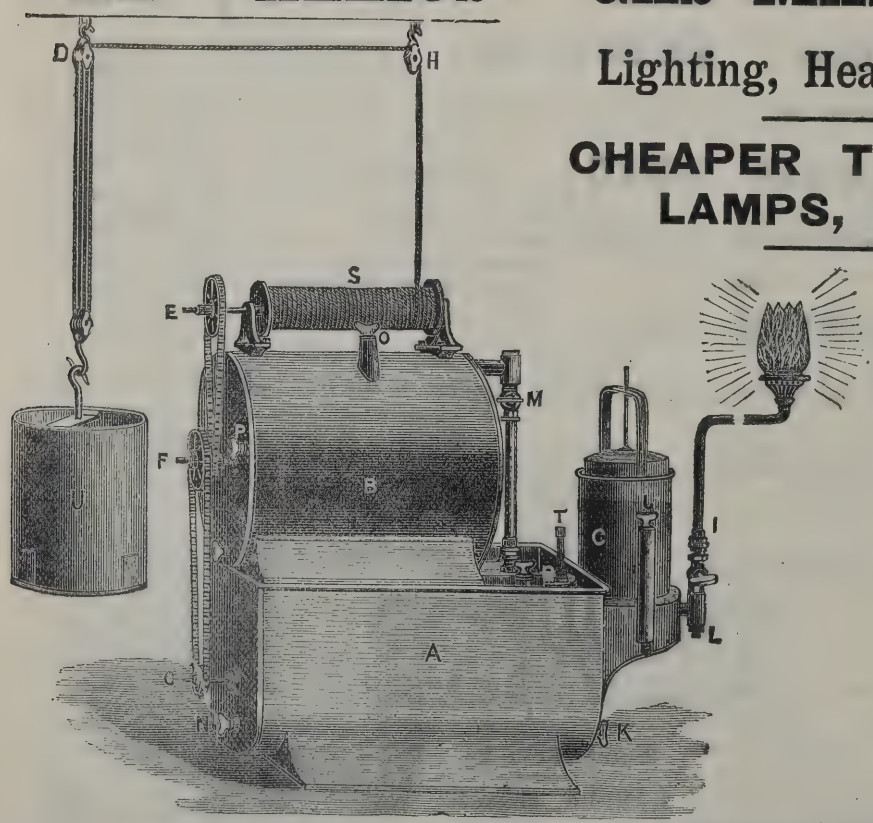
* A paper by Professor C. H. Moore, of Harvard University, read before the Convention of American Architects and published in *Architecture and Building*.

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Romanesque is structurally Roman except in so far as it exhibits features that are tending towards Gothic. To comprehensively designate this transitional architecture, the term "Romanesque" is a good one for which it would be hard to find a substitute. But in connection with the origin of Gothic we need to discriminate. For when we look for the structural antecedents of Gothic we find that some great classes of Romanesque buildings exhibit them so slightly and imperfectly that they can hardly be regarded as antecedents at all.

In general what is known as basilical Romanesque, buildings like the cathedral of Pisa, had almost nothing to do with the structural evolution of the Gothic style. In its most general form the basilica does, of course, foreshadow the Gothic, and, as regards this general form, it may be considered as a prototype. But in its constructive system the basilica contained almost no element of growth. Its timber-roof called for no system of supports such as could in any way suggest the organic Gothic system.

It may, indeed, be said that some of the antecedents of Gothic reach back to those few Christian Roman monuments in some parts of which a rudimentary functional grouping of supports occurs. The first and most important instance of such a grouping that I know of is that which appears in the so-called basilica of Maxentius in the Roman Forum. This building dates from the beginning of the fourth century, and it followed closely after the well-known arcade of the court of the Palace of Diocletian at Spalato. As that is the first known instance of the logical use of the arch in connection with the columns, so, I believe, this basilica of Maxentius exhibits the first instance of a groined vault springing from columns placed in front of the piers, unless the great hall of the Baths of Caracalla may have exhibited a similar arrangement at a preceding date. It will be remembered that this system presents a pier carrying the main archivolts with a detached column, surmounted by a strip of entablature, to carry the vaulting; something remotely foreshadowing the Mediæval grouped support is thus to be noted as far back as this.

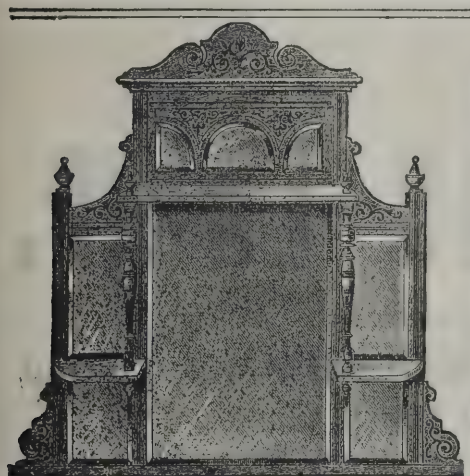
But nothing appears to have grown out of this monument in the way of the development of an organic system of supports for vaulting. It was constructed towards the end of what may be called the period of Imperial Roman art, and the Christian Roman builders, as is well known, employed the timber-roofed basilica with the simplest forms of superposed colonnades and arcades, having no organic connection with each other; in no feature, except perhaps the pier of the Eastern arch —which sometimes has a column in front of it—suggesting anything in the least like the Gothic forms.

The coupling of shafts, as in some of the Roman circular buildings, like Sta. Constanza at Rome, has far less to do with the development of Gothic, for such grouping has no structural significance. Its columns have no relation respectively to different parts of the superstructure. In the Roman buildings of Central Syria an arrangement similar to that of the basilica of Maxentius occasionally occurs, though not in connection with vaulting. In the church of Roueiha, dating from the sixth century, engaged piers, carrying transverse arches, are incorporated with the piers of the great arcade, and the same thing occurs in the piers of the apse of the church of Tourmain, but the principle is not developed into a system, and it is always confined, as it is also in the basilica of Maxentius, to a single storey.

A very remote suggestion of a functional grouping of piers, extending over two storeys of arcading, occurs in the supports of the central dome of the church of St. Sophia at Constantinople. And it is not impossible that something like this, which is not uncommon in Byzantine design, may have given the initiative to the early Mediæval builders.

The first true instances of grouped supports designed to carry vaulting and embracing several storeys occur in the eleventh-century churches of Northern Italy, in the style known as the Lombard Romanesque. In this region the vigorous genius of the Lombard race had stimulated invention and developed constructive ideas and methods which largely superseded those of former times.

The Lombard constructive system, as exhibited in its most important monument—St. Michèle of Pavia—was a radical innovation. The vaulting of the nave of this building was originally quadripartite in square compartments, like that of the basilica of Maxentius. It was furnished with heavy transverse ribs of two orders, both of square section, and it presented the first known instance of the use of groin ribs and longitudinal ribs. The sustaining pier is compounded of as many members, which rise from the pavement, and are crowned with a compound capital that furnishes a separate member for each vaulting-rib. The vault compartments of the aisles have but half the space of those of the nave, which necessitates the insertion of an intermediate pier. This pier has four engaged shafts, two of which carry the sub-orders of the archivolts (which are in two orders), one to carry the intermediate transverse rib of the aisle vault, and one on the side of the nave which rises to the triforium-string but carries nothing,



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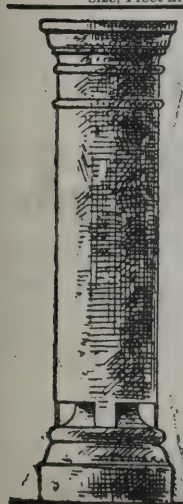
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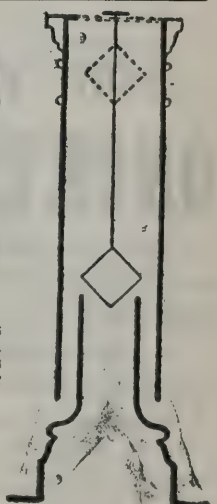
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and is the only member in the system which is not perfectly logical. The double archivolts of the main arcade are supported by square members and engaged shafts in both main and intermediate piers. The church has also a triforium gallery, with double archivolts and functional supports. The building shows a most remarkable advance on anything that we know of that had gone before it. Indeed the Gothic system is here very fully foreshadowed, though radical changes had to take place in the forms of the vaulting before it could be further developed.

This Lombard system was carried over the Alps into Germany, and there in the twelfth century crystallised, so to speak, into the magnificent Rhenish Romanesque, which, by maintaining the square vaulting compartment, precluded any structural growth. It was the Lombard Romanesque, then, and its derivatives which contained the first distinct germs of the Gothic style. But these germs could not develop without congenial soil. The soil of Northern Italy was not congenial. Here by the twelfth century inventive vigour was spent. The Lombard element had been absorbed, and the Italian genius began to reassert itself with all of its conservative tendencies. The Italian constructive traditions were fundamentally Roman, and hence the basilical idea was, in church building, largely reinstated, though some of the Lombard principles were, in some localities, often incorporated with it, though without any inventive results.

The soil of Germany proved equally uncongenial. The German builders were slow in invention and almost as conservative as the Italians of acquirements that suited their needs and tastes. But France was, in the eleventh and twelfth centuries, the region of the most active intellectual life that then existed anywhere in Europe. And it was the Romanesque of France, and of France only, that directly gave rise to the wonderful development known as Gothic architecture.

But the Romanesque in France assumed a variety of forms, not all of which were found with the germs of Gothic. The French Romanesque is broadly of two classes, which occupy respectively the two principal geographical divisions of the country—the northern and southern. The Romanesque of Southern France is mainly characterised by the use of the barrel vault of either round or pointed section—a form which did not suggest, and was not capable of, any further development. This form of vault was but a survival of the Imperial Roman system, in a region which had maintained longer than any other the ancient civilisation and traditions.

Buildings like St. Trophine, St. Gilles and Vésone, though magnificent in their way, were, as regards their vaulting, but a final effervescence of an obsolete system. And although their builders adopted the Lombard grouped pier, variously modified, yet functionally adjusted to the arches and ribs with which their vaults were strengthened, they had not used these borrowed forms inventively; and in this class of monuments could, therefore, contribute nothing towards the development of a new art. Hence no new art arose in this region, or in any other, as a result of their influence.

But in the north of France—where ancient monuments had been fewer, ancient traditions less authoritative, and where the fusion of races had been more complete and better balanced—imagination had been highly stimulated, and new constructive forms that were quick with potent energy began early to appear. The use of vaulting did not set in here as early as in the south. The northern Romanesque builders of the eleventh century usually covered their naves with timber roofs. But when repeated disasters from fire had demonstrated the necessity of resort to vaulting, the fecund groined form was invariably adopted, which, over the rectangular compartments that had prevailed in this region, led, in the hands of these energetic and ingenious people, to a series of experimental innovations which followed each other in rapid succession until the Gothic system was reached.

There were here several centres of Romanesque inventive activity, each of which seems to have contributed something to the development of the chief school which soon became that of the Ile-de-France. These were mainly Burgundy on the one side and Normandy on the other. The Burgundian Romanesque is fully exemplified in the nave of the abbey church of Vézelay (twelfth century). It exhibits a modified application of the Lombard system to a building of narrow bays, giving rectangular instead of square vaulting compartments. This form is generally regarded as derived from the basilical type of buildings, but it seems to me that the intermediate pier of the Lombard type may naturally have suggested it.

However that may be, the piers are all alike, and are composed of members having a perfectly functional adjustment to the vaults and arches. Though showing an advance on the vaults of St. Michèle in being constructed over oblong compartments, these vaults of Vézelay are less advanced as regards their rib systems, for they are not provided with diagonal ribs. And it is interesting to note that the pier is correspondingly simplified, the member which, in St. Michèle, carries the

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diagonal rib, being omitted. But the system is perfectly logical as far as it goes. The vaults have heavy transverse ribs, and wall ribs, the former being of two orders. The first order is carried by a broad pilaster starting from the pavement, while the sub-order rests on an engaged shaft, also rising from the pavement. The wall ribs are supported by short pilasters resting on the triforium ledge. The double archivolts of the lower arcade are sustained, as in St. Michèle, on square members and engaged shafts.

The triforium space is low, and without openings—a simplification of the Lombard type that is common in the Rhenish as well as in the Burgundian Romanesque churches. This building, though constructed essentially on the Romanesque inert principles, nevertheless contains internally, as we see in rudimentary form, nearly all the constructive features of a Gothic edifice.

Some recent writers have supposed that the Cistercian order of monks were instrumental in developing and extending the early Gothic system. The learned German writer, Dehio, has lately published an essay on the "Beginnings of Gothic," in which he takes the Cistercian churches of Pontigny, in Burgundy, and Fossanora, in Italy, as types of transitional building and as important monuments illustrating early Gothic developments. But neither of these buildings show the initial principles of the new style. And if they did it would not show that Cistercian influence had much to do with the formation of Gothic, for these, as regards their Gothic features, are exceptional buildings, though in essential constructive principle they belong strictly to the Burgundian Romanesque category. The Cistercians had no consistent modes of building. They adopted different forms according to circumstances, in some cases, as at Hautrive, employing the barrel-vault, in others, as at Pontigny, imitating the features that had been developed in the Ile-de-France.

The typical Romanesque of Normandy is earlier than that of Burgundy, the existing church of St. Stephen, at Caen, dating its foundations from the year 1066. It is a more direct copy, though much modified and simplified, of St. Michèle, of Pavia. Whether this building was originally designed for vaulting is not known. But it is certain that it was first completed with a timber roof. Its main piers are, however, compounded of members corresponding to those of the Lombard pier, and they are well adjusted to the vaulting with which the timber roof was replaced early in the twelfth century. This vaulting is of a form that had not before, so far as is known, been constructed. It is primarily a modification of the square-groined vault resulting from the insertion of an intermediate transverse rib which subdivides the lateral cells, making the compartment sexpartite. Instead of converting the Lombard intermediate pier of the ground storey into a complete pier precisely like the main piers, thus producing narrow or rectangular vault compartments as at Vézelay, the builders of Caen merely prolonged the intermediate vaulting-shaft to support the intermediate rib. In all other respects the system conforms to that of St. Michèle, except in its proportions, which are much elongated in the manner that subsequently prevailed in the north.

The sexpartite vault system, which apparently originated at Caen, was immediately taken up and perfected by the early Gothic builders of the Ile-de-France; but it is not true, as is often affirmed, that it was exclusively used in early Gothic buildings. The vaults of Caen have a full system of ribs with exception of wall-ribs. As yet the Romanesque developments tending toward Gothic were mainly confined to the interior of the structure. But a first step in the direction of a corresponding external system was taken when pilaster strips began to assume the form of projecting buttresses, and the germ of the true flying buttress appears, I believe, for the first time in the arches that are thrown against the piers under the roof of the aisles on the sister church to St. Stephen, the Abbaye aux Dames at Caen.

The Romanesque of the Ile-de-France was almost all destroyed in the twelfth century by the active rebuilding in the new style which then prevailed. A few monuments of moderate dimensions remain, however, from which a general idea of it is obtained—Morienval and St. Germain des Près. The square compartment was generally abandoned and the rectangular form substituted. This was, I think, a circumstance of capital importance, giving rise, as it did, to difficulties in vaulting which quickened the inventive genius of the builders.

The abbey church of Morienval is the most important existing monument as regards the direct antecedents of the Gothic style. It is a plain Romanesque building dating from the eleventh century, with a reconstructed apse dating apparently from the end of that century. Here we get, on a very small scale, a rudimentary apsidal aisle of four compartments, in whose vaults the groin rib occurs in connection with some very curious experiments in the use of the pointed arch. It is, I believe, the earliest monument in existence in which these two features are associated, and it was apparently the starting-point

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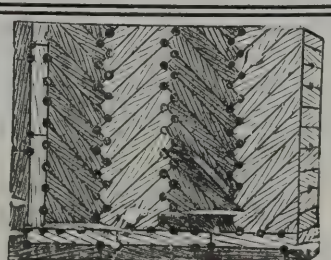
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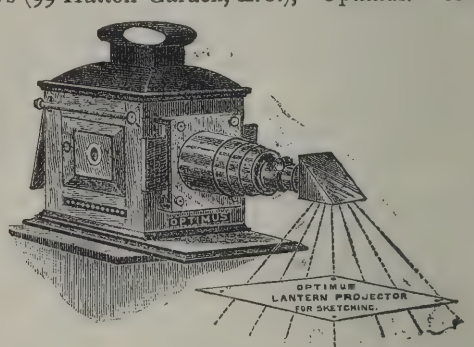
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SCHOOL BUILDING.

A MEETING of the Architectural Section of the Philosophical Society of Glasgow was held on Monday in the rooms, Bath Street, at which Mr. John M'Math, Glasgow School Board Master of Works, read a paper on "The Progress of School Buildings since 1873." In the course of his paper Mr. M'Math surveyed the architectural development of the various educational edifices which have been raised in our city under the administration of the School Board during the eighteen years which have elapsed since the Education Act came into force. While he remarked the development in intellectual force and culture in the time alluded to had been brilliant in the extreme, the progress made with reference to our educational buildings, not only as regards comfort and attention to the laws of health, but also in relation to architectural beauty, had been a feature worthy of the sincerest congratulation. When we considered the splendid structures we now had as educational institutions in our city, it was alike natural and graceful that we should gratefully recognise the able work performed by the first School Board which Glasgow appointed in 1873, immediately after the Education Act came into force. To the firmly representative character, the strong individuality, and the fine administrative power of the Board we owe much in the way of laying down an enlightened, firm policy, which subsequent Boards had in a large measure followed. Mr. M'Math afterwards went into detail on the subject of his paper. He was awarded at its close a cordial vote of thanks.

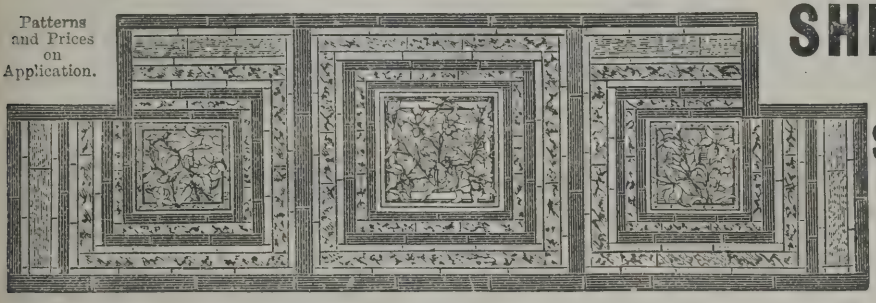
THE MANCHESTER SHIP CANAL.

THE discovery that the cost of completing the works of the Manchester Ship Canal was under-estimated has caused consternation. It is not impossible that a further outlay of a million will be needed. The representatives of the Manchester Corporation have demanded further investigations, and consider it is unwise for the company to dispense with the experience and ability of contractors. The following explanation has been offered by the chairman of the company, Lord Egerton of Tatton :—

The two reports of the sub-committee agree generally as to the facts, and point substantially to the same conclusions, viz. economy of resources, and the opening of the waterway to Manchester as early as possible with the funds at the disposal of the company. I heartily concur with the regret expressed by the Corporation directors that the estimates presented by the two engineers in January last should, owing to unforeseen difficulties, have been substantially augmented, and the forecast of expenditure so largely exceeded, as appears by the report of the sub-committee. Their report, which is carefully drawn up, shows that this large discrepancy from the previous estimates is mainly composed of fresh items of cost which have arisen from various causes beyond the control of the Board, and which could not accurately have been foreseen with the knowledge at our disposal, rather than from the increase of expenditure over the contract prices for the ordinary works of the canal.

The extraordinary prices have been made up of the following items, which may be summarised as follows :—1. The extra cost of finishing and cleaning up the sections between Eastham and the mouth of the Weaver, not included specially in the contract prices, and which would have fallen upon the contractor. 2. The effects of frost and flood in disintegrating the banks and causing heavy deposits of silt in the cuttings have been far greater than could have been anticipated in

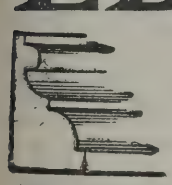
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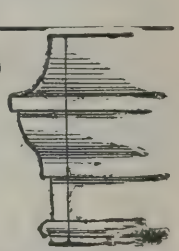
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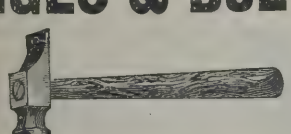
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January last, when the frost was still in the ground and the canal for several miles was filled with water. 3. The necessity for flattening the slopes and the purchase of land for that purpose in many places could not, from the previous experience of the last two years, have in all cases been anticipated. 4. A large portion of the rock, which promised from the borings to be sound, has turned out to be worthless for masonry or even pitching. 5. In consequence of the excessive rain and floods during the summer months the dredging has been much slower and more expensive.

The Board is also aware that not only up to the end of January last, but even up to March, the changes consequent on the death of the contractor, combined with the disastrous weather already alluded to, greatly retarded the general progress of the work and added to the expense. The double set of officials on the contractor's and company's staff have since that time been reduced as far as seemed consistent with the efficiency of the work. From May last, and since the passing of the Bill through Parliament, which occupied a large portion of the directors' time during the summer months, the Board have narrowly scrutinised their expenditure and checked it by an elaborate system of returns, both from the engineer and Mr. Topham. The Board have also endeavoured to do as much as possible all work by piecework or by contract, and I do not believe there has been any want of economy proved in the purchase of stores. The agents of the company have followed the plan adopted by the late Mr. Walker after his great experience of contracts, and where practicable, the prices have been settled by competition.

I trust that the suggestions made by the sub-committee and the Corporation directors may be fairly considered by the Board, as I believe nothing is further from their wish than to spend any more money upon the canal than is absolutely necessary for its completion at as early a date as possible and in the most substantial way.

The report of the sub-committee and the separate pronouncement signed by Alderman Sir John Harwood and Councillor Southern having been considered, it was resolved that the report of the sub-committee be adopted and that the following statement be placed on record :—

The Board also express extreme regret that the increase in the quantities of work done and to be done should add so much to the estimate of January 1, 1891. Some of the work might perhaps have been foreseen by the company's engineers, but it is only fair to record that when that estimate was prepared the cuttings between Manchester and Warrington were more or less full of flood water, and that it was therefore difficult to estimate the amount of extra work caused by the floods. The engineers could also hardly be expected to foreknow that the stone in so many of the cuttings would not only prove to be worthless, but so soft as to necessitate very heavy expenditure in brickwork in order to prevent the sides of the cuttings from falling into the canal. The landslips and silting have been much more serious, too, than might reasonably have been expected. Delay is one of the most expensive items, and the opening of the section from Ellesmere Port to the Weaver was delayed nearly two months by the costly necessity of facing with brickwork some portions of the rock sides of the canal, which, though hard when excavated, subsequently became rotten and soft, of repairing landslips and of driving piles to prevent further slips where the soil was found, as the excavation proceeded, to be as treacherous as quicksand. The onerous clauses imposed upon the company in the Act of 1885 have continued to be a source of anxiety, delay and expense ; but the great bulk of the difficulties thus arising are now, happily, overcome. Hitherto the progress of the work has, however, been hampered and delayed by those severe conditions to an extent that was probably never expected by those who had to accept them to secure the passing of the Act.

The Board have never lost sight of the necessity of exercising the strictest economy. The reduction of the number of the officials engaged in carrying out the works, who were all taken over from the contractor by the company for the purpose of securing efficient control over the works, has been a matter of frequent and anxious consideration, and large reductions have been made from time to time as portions of the works were completed. As lately as last week a further reduction was ordered that will lessen the salary list by 2,725*l.* per annum, and the Board see that other larger savings will soon be feasible without prejudicing the progress of the works, although a work of such magnitude will until its completion require a number of experienced, highly-paid men as organisers and supervisors. All the agreements give the Board power, however, to terminate them on short notice, and reductions can therefore be speedily effected whenever they are seen to be safe and desirable.

A large decrease in the expenditure on workshops has been effected since the opening of the canal from Eastham to the Weaver (10½ miles), and a further reorganisation is now or will shortly be practicable. It has been a standing order and the persistent policy of the Board to adopt piecework to the utmost

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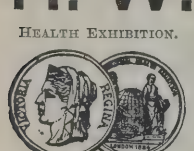
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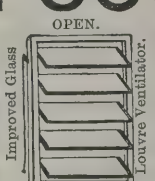
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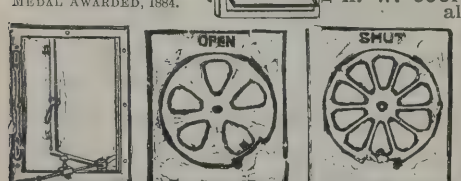
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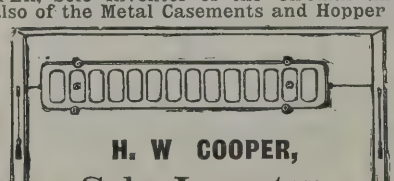
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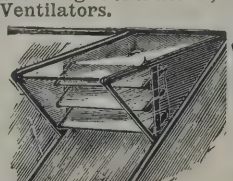
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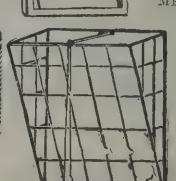
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possible extent, and they cordially welcome any suggestions that will enable them further to substitute piecework for day-work. The Board are ready to let any portion of the work by public tenders where, in the opinion of the company's engineer and the Corporation engineer, there would be no risk of the contractor hampering or delaying the adjoining work, or interfering with the working of the railways, or of disputes arising that might lead to costly arbitrations. The Board place, however, on record the fact that the increased estimate is mainly caused by larger quantities of work having to be done, and stone having to be bought, and that only a comparatively small increase arises from enhanced prices. When the 10 per cent. for contingencies was added to the January estimate, the chief contingency in the minds of the Board was the possibility of the prices proving to be in excess of those calculated upon. The increased prices now calculated absorb a considerable portion of the 10 per cent.

Some of the difficulties inseparable from the letting of portions of the work are set forth in the following extract from the report of the Corporation engineer to the Corporation, dated February 28, 1891 :—"I fear it would be difficult to rearrange the work with a view of reletting it in sections for completion, in consequence of the interlacing and dependence in some cases of one portion of the work upon another, and as to the distribution of the plant ; further, it is doubtful whether any real advantage would be gained by this in the present state of the work, owing to the loss of time in arranging the contracts and in reletting the work. I have, therefore, concluded that it will be best to continue the work by administration. Under this system, much of the work to be done may still be let piecework, by which many of the advantages of contract work would be obtained."

Arrangements have already been made for the purchase of all materials and stores upon publicly invited competition only.

The Board have to keep constantly before them, when discussing reductions in expenditure, the fact that time is almost the most essential element in all the calculations pertaining to the cost of the works. The cost of every working day's delay, measured in actual payment of money for interest and fixed charges, leaving out of consideration the fact that 8,000,000*l.* of shareholders' capital expended on the work will be idle until the canal is opened, is 1,000*l.* sterling.

The report of the Ship Canal Committee of the Manchester Corporation states that the committee have received no satisfactory explanation of the fact that, whereas in January last a certain amount was affirmed to be adequate to complete the canal, it is now stated by the engineers of the company that a further sum of 863,595*l.* will be necessary. It goes on to say :—"We consider that a grave responsibility exists as to the estimates upon which the Corporation acted in their decision to render financial help, and would like to see this responsibility fixed." They do not doubt that large room exists for retrenchment in the conduct of the enterprise, and they emphatically endorse the suggestions made by their representatives. Considering the position in which the enterprise stands, they think there should be such arrangements made by the Board as would give more ready effect to any suggestions the Corporation directors may find it their duty to make. The committee regret that an earlier recognition was not made by the Ship Canal Board of the views of the Corporation representatives, and that the company's representatives have arrived only at a tardy recognition of the advantages of purchases by tender. Although a statement appears in the report to the effect that the directors are prepared to purchase by tender, as a matter of fact no such purchases have up to this date been made. The committee record their confidence in the commercial success of the undertaking, and are gratified to note that in neither of the reports placed before them does any doubt on this point find expression.

The decision of the City Council on the subject will be given at the next meeting.

PRIVATE BILLS IN PARLIAMENT.

THE time for giving official notice of all Private Bills that will be brought forward next session and of all Provisional Orders for which application is about to be made to the Board of Trade, has now expired. From the notices thus given it is found that the total number of Private Bills proposed to be introduced into Parliament next year is only 188, and the total number of Provisional Orders that will be applied for is not greater than 69. Of the total number of Private Bills 81 relate to railways, docks and canals ; 33 to gas, water and electric lighting undertakings; 21 are Corporation and Local Board Improvement Bills ; 11 relate to tramways ; and the remainder are of a miscellaneous character, among which is included the Channel Tunnel Bill, which will again be brought forward. No fewer than 24 of the total number of Private Bills relate directly to London, among which are two projected railways from Waterloo to the

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City, a line from Waterloo to Baker Street, and another projected line from Charing Cross to St. Pancras and Hampstead. The existing or authorised electrical railway companies are also promoting extensions from King William Street to Islington, and from the Royal Exchange to Liverpool Street; whilst other lines are proposed from Finsbury Park Station to the City and from the City to Epping Forest. The London County Council are responsible for four Bills, namely, their General Powers Bill, a Bill for the construction by them of tramways over Westminster Bridge to Charing Cross, a Bill for the construction of subways for the reception of gas, water and other pipes, and a Bill dealing with the London water supply, the expense of promoting which will, in the event of failure, be paid by the Corporation of London. Of the total number of provisional orders 30 relate to electric lighting, 16 to gas and water companies, 13 to piers and harbours, and 10 to tramways. Of the electric lighting orders 13 are for powers to light certain areas in London which are already allocated to other companies under Provisional Orders confirmed by Parliament in past sessions.

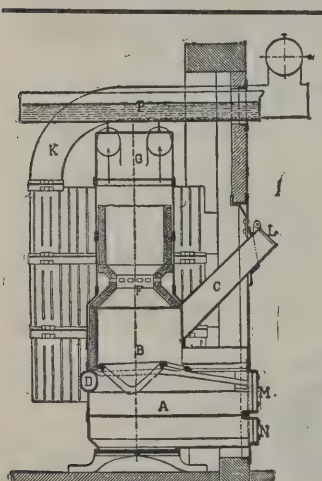
PENALTIES IN CONTRACTS.

THE appeal of the plaintiff, Mr. George Law, contractor, in the case Law *v.* Local Board of Redditch, was heard before the Master of the Rolls, Lord Justice Lopes and Lord Justice Kay. The action was brought to recover 834*l.* 7*s.* 1*d.* for work done and materials supplied. By a contract and specification dated February 27, 1889, the plaintiff undertook to do certain drainage works for the defendants. The contract contained the following provision:—"The works shall be completed in all respects and cleared of all implements, tackle, impediments and rubbish on or before April 30, 1889, to the satisfaction of the surveyor, to be testified by a certificate under his hand, and in default of such completion the contractor shall forfeit and pay to the urban authority the sum of 100*l.* and 5*l.* for every seven days during which the works shall be incomplete after the said time, and the sums so forfeited may be recovered by the urban authority from the contractor as and for liquidated damages." In the specification there was the following proviso:—"The whole of the works herein specified, together with any extra works, shall be completed within a period of two months and three days, dating from the signing of the contract, and if the contractor fail to complete the works in the specified time he shall forfeit the penal sum of 100*l.* and a further sum of 5*l.* for each and every week during which time the contract remains incomplete after the specified time, and in addition to these fines he shall pay the extra time of the clerk of the works employed in superintending the works, all of which penalties or charges shall be deducted from any moneys that may be or become due to the contractor or his sureties or shall be recoverable from them." It was agreed between the parties that all disputes between them touching any alterations, additions or omissions should be referred to the Board's surveyor, Mr. Stephen Elgar Thorrold, his award to be final and conclusive, and Mr. Thorrold had found that the plaintiff was entitled to receive 499*l.* 13*s.* 4*d.* The defendants denied that more than the amount of the surveyor's award was due to the plaintiff for extra works, and they claimed in penalties 160*l.*, because the plaintiff had neglected to complete the contract by the stipulated time, April 30, 1889, to the satisfaction of the surveyor, whereas there was a delay beyond that time up to July 30. The defendants had paid 399*l.* 13*s.* 4*d.* into Court as sufficient to satisfy the plaintiff's claim, and they counter-claimed for 100*l.*, the amount of two claims brought against them, and which they had been compelled to pay, in respect of loss and damage to property from the neglect of the plaintiff's workmen during the execution of the works of the contract. At the trial Mr. Justice Hawkins found for the defendants; hence the present appeal.

For the appellant, it was contended that the provisions created a penalty and not liquidated damages. The sums of 100*l.* and 5*l.* per week could not, therefore, be recovered as a whole, but only the damage actually suffered by the defendants in consequence of the delay.

The Master of the Rolls said that it was unnecessary to go through all the cases on the subject. There was one canon of construction as to which all the decisions agreed. When the parties to a contract had agreed that in case of one of the parties doing or omitting to do some one thing he should pay a specific sum, that sum would be construed by the Courts to be liquidated damages and not a penalty. The only exception was where it was agreed that a large sum should be paid in respect of the nonpayment of a smaller sum; in that case the Courts would consider that the large sum was a penalty and not liquidated damages. If the sum were agreed to be paid in respect of any of several events, some of which might produce inconsiderable damage, then the Courts might hold it to be a penalty, and might not suffer more to be recovered than the

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157 STRAND, W.C. (Four Doors from Somerset House) LONDON.

damage actually caused by the breach. But where the payment depended on one event, and one event only (not being the non-payment of money), then the sum payable had always been construed as liquidated damages, assessed by the parties to the contract. That made it necessary to interpret the contract in this case. In his opinion it was quite clear that two different things were spoken of—the completion of the works and the clearing them from rubbish, &c. The sum of 100*l.* and the 5*l.* per week were made payable if the completion—not the clearing—did not take place on a certain day. That, therefore, was one event, and the sum was payable as liquidated damages. Even if the clearing away of the rubbish was included in the completion that only made it one event, and as that event had not taken place on the fixed day, the whole sum fixed became payable as liquidated damages which had been assessed by the parties.

Lords Justice Lopes and Kay concurred, the latter stating that the terms of the contract were purposely worded to prevent the litigation that took place in the Equity Courts to recover penalties for non-performance. The sums stated in the contract were the payments to be made in the nature of liquidated damages if the works were not completed by the agreed time.

The appeal was then dismissed, with costs.

BUILDERS' BENEVOLENT INSTITUTION.

AN election of one female pensioner on the funds of this Institution was held at the offices, 35 Southampton Row, Bloomsbury Square, on Thursday, the 26th ult., Mr B. E. Nightingale, president, in the chair. There were four candidates for the vacancy. Shortly after the close of the poll the scrutineers, Messrs. T. Stirling and Ernest Rider, announced the result of the polling to be as follows:—Margaret Alice Richardson, Preston, North Shields, aged 66, widow of T. B. Richardson, late of Bayswater, builder (sixth application), 2,655 votes; Mary Ann Shapland, 132 Stamford Street, Lambeth, aged 71, widow of William Shapland, builder (fifth application), 3,294 votes; Sarah Elizabeth Drake, Tylers and Bricklayers' Almshouses, King Henry's Walk, Ball's Pond, widow of Francis Drake, late of Acton, builder (second application), 1,339 votes; and Susanna Mansell, 20 Bridge Road, Hammersmith, aged 68, widow of William Mansell, builder (first application), 806 votes. The successful candidate was therefore declared to be Mary Ann Shapland.

Among the friends of the Institution other than those already named who took part in the proceedings were Messrs. Geo. Plucknett, J.P., hon. treasurer; C. Bussell, J. T. Bolding, W. Scrivener, T. Hall and H. Ashby.

Votes of thanks to the Chairman and scrutineers closed the proceedings.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

19827. Samuel Benjamin Wilkins, for "Improvements in the construction of fireproof doors, iron or steel shutters, fire-screens, safes, or fireproof-rooms."

19835. William Alfred Crook and Henry John Payne, for "Improvements in gravity control, as applied to electric measuring instruments."

19857. Frederick Rogers Lipscombe, for "Improvements in chimney cowls and cowls for ventilating shafts."

19869. Patrick Barry, for "Improvements in the covers of kitchen boilers."

19877. Curd Nube, for "Improvements in adjustable clamps for bench vices."

19887. Augustine McNerney, for "Improvements in and relating to the hanging of doors and shutters, whereby the closing of same may be rendered automatic without the aid of springs."

19910. Charles Knapp, for "Combined automatic sash lift and lock."

19947. Charles Joseph Crosby, for "An improved appliance for preventing down draught in chimney and other shafts."

19998. Henry Defries and Wolf Defries, for "Improvements in window frames."

20269. Ludwig Haarmann, for "Means for securing asphalte mastic as a coating or stopping upon all descriptions of buildings and building materials."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.

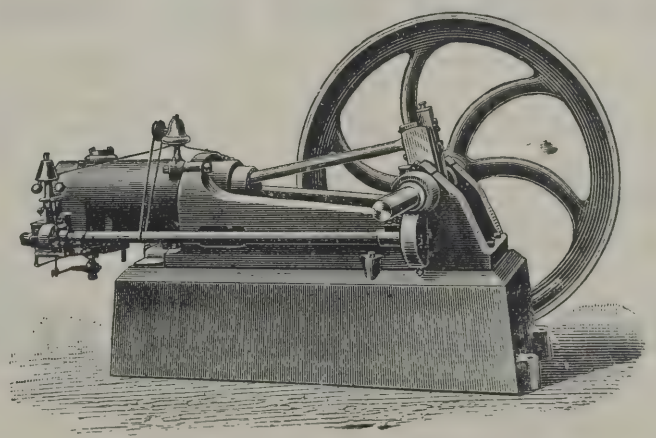
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CHICAGO CONSTRUCTION; OR, TALL BUILDINGS ON A COMPRESSIBLE SOIL.*

WHAT is now generally known as the Chicago Construction consists of a fireproofed steel skeleton, so arranged that all the load, including the walls and partitions, are carried storey by storey on the columns. The foundations, as far as practicable, are on isolated piers. Even before the Chicago fire, what is known as "foundation by isolated piers" had been accepted by the Chicago architects as the best adapted to their peculiar soil. Underlying Chicago is a bed of soft, compressible clay of great thickness, some 60 to 90 feet. This clay has one redeeming feature; it satisfies Professor Tyndall's definition of a solid: "under a given load it will compress a certain quantity and stop, and the compression will not be renewed without a change in the conditions." Experience teaches that a load of 3,000 pounds per square foot will cause a compression of about 2 inches, and that it is desirable not to materially increase this load or the compressions may not be sufficiently uniform. With 3,000 pounds per square foot, with proper care in the distribution of the loads, a practically uniform settlement can be obtained with reasonable certainty.

As early as 1873 Mr. Fred. Baumann, one of Chicago's oldest architects, had published a little pamphlet on isolated piers and their adaptability to Chicago foundations. The advantages of a system of isolated piers on a compressible soil is its elasticity, it being impracticable during the construction of a building to keep a uniform load on the foundations: hence the necessity of allowing the parts to settle at different times, counting upon a general uniformity of settlement in the end. A continuous foundation is liable to be broken up and very unequally; therefore even when the pier-foundations touch each other they are kept separate by plank or sheet piling on the line of junction.

In 1883 the writer was requested by orders received from the officers of the Home Insurance Company of New York to prepare designs for a ten-storey fireproof office building to be erected in Chicago—dimensions 100 by 135 feet—on the corner of La Salle and Adam Streets, the principal storey to be arranged for two great banks or kindred use, while all the storeys above should be divided into small offices, all of which must be well lighted. These requirements when coupled with the condition of a very compressible soil, carrying only a light load per square foot, necessitated a different method of construction from those in general use. The piers must be narrow in order that proper space might be left for windows; the walls must not be as heavy as the old construction would demand, or there would not be sufficient space on the ground for the foundations. A column in each pier was the natural solution of the problem. Lintels between columns, forming heads of windows, carried the street walls storey by storey; the brickwork was reduced to the thickness necessary to hold the window-frames or to fireproof the metal columns and lintels. The method of construction has been improved upon; each architect using it has added something, particularly to the details. The manufacturers of steel, terra-cotta and fireproofing have improved their material and adapted it more especially to this style of construction, so that I have selected one of the late buildings—a building now under construction known as the Fair, occupying a half block on Dearborn, Adams and State, 400 by 160 and seventeen storeys—241 feet—high above the sidewalk.

Rolled steel columns are in general use for these tall buildings, all connections being made with hot steel rivets, hence more rigidity as against wind pressure and vibrations of moving loads, like running machinery, than can be obtained with the cast columns and screw-bolt connections. Where so much depends upon the columns every precaution against accidents should be taken. The rolled steel column composed of several parts rivetted together, each part inspected separately both for quality of metal and for surface, and then the finished column inspected for workmanship, offers a guarantee against any serious failure far beyond what can be expected from a cast column as usually manufactured. In the Fair the Z-bar column is used. The plate and the brackets are rivetted together and the beams and girders are rivetted to the lower column through the plate and to the top column by an angle.

The wind-pressure must be looked after. The floors are, by the fireproof arches, made sufficiently rigid, but the columns may require bracing, either by knees, as in naval architecture, or by X-rods, as in bridge construction.

The construction of tall buildings on a compressible soil much resembles, in the generalities, the construction of a railway bridge of the first order. The design must be such that the material is used in the most economical manner; every piece must be calculated. There must be sufficient material and no more, for it is essential, not only from economy but also to reduce the weights on the foundations, that the construction

* A paper by Mr. W. L. B. Jenney, read before the Convention of American Architects.

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should be as light as possible, consistent with stability. To this end the live loads are provided for as nearly as practicable as they will actually occur.

The column loads in the Fair building are figured for the full dead loads, plus such a percentage of the live loads as will probably obtain :—

Column.	Live load which the beams in the storey above the respective column are calculated to carry.	Percentage of the sum of the live loads of all the storeys above the respective column.*
Attic column	40 lbs. per square foot	100 per cent.
16 storey column	75 " "	90 "
15 "	75 " "	87½ "
14 "	75 " "	77½ "
13 "	75 " "	75 "
12 "	75 " "	72½ "
11 "	75 " "	70 "
10 "	75 " "	67½ "
9 "	75 " "	65 "
8 "	75 " "	62½ "
7 "	75 " "	60 "
6 "	75 " "	57½ "
5 "	130 " "	55 "
4 "	200 " "	52½ "
3 "	130 " "	50 "
2 "	130 " "	47½ "
1 "	130 " "	45 "
Basement column	130 " "	42½ "

Floor-beams are calculated to the dead load, plus the full amount of the live load designated as the maximum load for said storey. The girders are calculated to carry all the dead load, plus 90 per cent. of the live load designated for said storey. These reductions are made to reduce the metal to the probabilities. Although a floor-beam may be loaded with the full designated amount per square foot of floor carried by said beam, such is not true of the girder, as certain spaces or passages must be left for the service. It is easy to see that the probable percentage of the total designated live loads on any given column diminishes as the number of storeys above said column increases. Footing-beams must be calculated to carry all the load of the basement column, plus the basement floor load that will rest upon them—often the important item of boilers, engines or dynamos.

The load on the clay is of great importance, or the settlement is unequal. It must be all the dead load plus so much of the live load as will actually come upon it. The live load on the clay depends upon the use to which the building is to be applied. In a hotel or office building the live load is so small in proportion to the dead load that it may be neglected in calculating the area of the supporting clay, particularly as this weight is not applied until the building has settled, that is, the compression of the clay has taken place.

Experience has shown that after the clay has been compressed by a weight of 3,000 lbs. per square foot, and allowed a few months of repose, no addition to that compression will obtain without a material addition to the load, so that it is good practice to neglect the live load on the clay in hotels, office buildings and light retail stores ; not so, however, in warehouses or other buildings carrying heavy floor loads, and particularly where there is running machinery ; these moving loads should be counted as double the actual weight, for the continuous jar has the effect of pounding and increases the compression of the clay.

The last addition to the tall buildings was the steel chimney. At the Fair there was no place for the foundations of a brick chimney stack such as was necessary for the battery of boilers sufficient to heat the buildings and run the elevators, electric light plant, house-pumps, &c. The external steel chimney had long been in use for manufactories—why not an internal steel chimney for an office building? This was found practical and economical. In these chimneys all the load is carried on the steel shell. Angles are rivetted on the interior each 20 feet or so, to carry the firebrick lining, and to avoid trouble from unequal expansion. The exterior is covered by plaster fireproofing resting on the floors. This covering hides the chimney and checks the radiation.

The material in these tall buildings is calculated so closely that the same rigid inspection is necessary as for a railway bridge. The specifications must be very full and explicit.

Tall steel buildings, constructed as described, are very substantial, and even earthquake-proof. The exterior can be almost entirely of glass, the windows separate only by the fireproof metal. The party walls may be, and usually are, carried storey by storey on the lintels supporting the floors ; the lintels carried on steel columns built in the thickness of the wall or projecting as fireproofed pilasters. This reduces the party wall to a uniform thickness in all storeys, say 12 or 16 inches. Hollow building tiles are often used for these walls, reducing the weight by nearly one-half.

* This percentage of live load, together with all the dead load, is the total load the respective column is calculated to carry.

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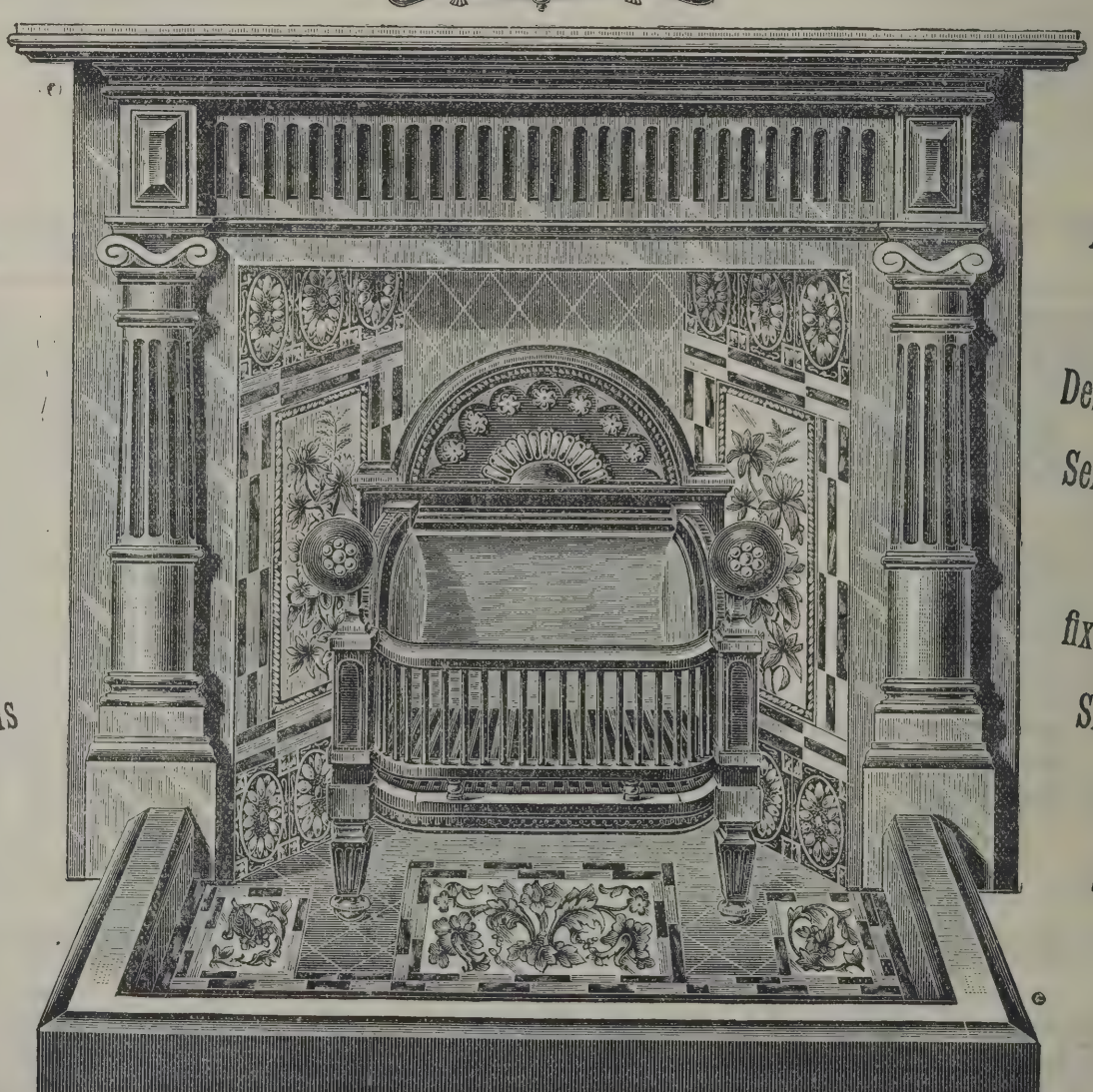
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Friday, December 4, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, DECEMBER 11, 1891.

TENDERS, ETC.

*** *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than* 5 P.M. *on Thursdays.*

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

COMPETITION OPEN.

BELFAST.—Jan. 1.—Competitive Plans are invited for a Hospital for Diseases of the Chest. Details can be had from Mr. F. Howard Sinclair, M.D., hon. sec. med. staff, 76 Pakenham Place, Belfast. Plans to be sent in in a sealed envelope, accompanied by a motto.

CONTRACTS OPEN.

BANFF.—Dec. 25.—For Works in Building Bank Office and Agent's House. Messrs. Wm. Henderson & Son, Architects, 124 Union Street, Aberdeen.

BATLEY.—Dec. 18.—For Building Four Dwelling-houses. Messrs. P. Spencer & Son, Architects, Batley Carr.

BEAUMARIS.—Dec. 21.—For Building Premises. Mr. R. G. Thomas, Architect, Menai Bridge.

BECKENHAM.—Dec. 14.—For Taking Down and Removing Trees. Mr. S. B. Carlton, Engineer, Local Board Offices, Beckenham.

BODIAM.—Dec. 31.—For Rebuilding Bodiam and Hammerditch Bridges. Mr. Henry Card, County Surveyor, Lewes.

BOURNEMOUTH.—Dec. 24.—For Lighting by Electricity the Pier, Pleasure Gardens and Municipal Buildings. Mr. F. W. Lacey, Borough Engineer, Town Hall Chambers, Bournemouth.

BRADFORD.—Dec. 16.—For Additions to House. Messrs. T. H. & F. Healey, Architects, Tyrrel Street, Bradford.

CARMARTHEN.—Dec. 28.—For Building Infant School and Alterations to Pentrepoth School.

CHATHAM.—Dec. 16.—For Erection of Engine-room and Other Buildings, for Electric Lighting Co. Mr. Betts, Architect, Medway Street, Chatham.

COLLINGHAM.—Dec. 16.—For Building Villa. Mr. C. F. Wilkinson, Architect, 35 Park Square, Leeds.

CROYDON.—Dec. 21.—For the Foundations and Substructure of New Municipal Buildings and Free Library to be Erected in Katharine Street, Croydon. Mr. C. Henman, Architect, 64 Cannon Street, E.C.

DUBLIN.—Jan. 1.—For Alterations to Mansion, Athgoe Park, Hazelhatch. Mr. Wm. H. Byrne, Architect, 20 Suffolk Street, Dublin.

EGREMONT.—Dec. 21.—For Building Church, Schools, Caretaker's House, Boundary Walls, &c. Mr. J. S. Moffatt, Architect, 53 Church Street, Whitehaven.

GUERNSEY.—Dec. 19.—For Building Secondary Schools. Mr. Frank Whitmore, Architect, Chelmsford.

HALIFAX.—Dec. 30.—For Building Store and Six Houses. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HALIFAX.—Jan. 2.—For Building Shop Premises. Messrs. G. Buckley & Son, Architects, Tower Chambers, Halifax.

HINCKLEY.—Dec. 14.—For Additions to Workhouse. Mr. J. Ball, Architect, 20 Spring Gardens, Hinckley.

KENDAL.—Dec. 11.—For Enlarging Bridge Mills. Mr. Stephen Shaw, Architect, Kendal.

LEEDS.—Dec. 11.—For Building Stores and Three Through Houses. Mr. J. M. Fawcett, Secretary to the Industrial Co-operative Society, Limited, 10 Albion Street, Leeds.

LEEDS.—Dec. 16.—For Building Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

LEWISHAM.—Jan. 14.—For Building Infirmary. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

LIVERPOOL.—Jan. 6.—For Building Workhouse Infirmary, &c. Messrs. C. O. Ellison & Son, Architects, 22 St. Thomas's Buildings, Liverpool.

LONDON.—Dec. 19.—For Supply of Paving Materials, Drain Pipes, Paint, Ironmongery, Castings, Timber, &c., for one year. Mr. G. Livingstone, Surveyor, 1 Pimlico Road. S.W.

MEDOMSLEY.—Dec. 19.—For Building Business and Manager's House. Mr. J. W. Rounthwaite, Architect, Blackhill, co. Durham.

OUSEBURN.—Dec. 16.—For Building Board School. Mr. F. W. Rich, Architect, 5 Eldon Square, Newcastle-on-Tyne.

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PONTEFRACT.—Dec. 17.—For Building Six Houses. Mr. W. Hurst, Architect, Corn Market, Pontefract.

RISHWORTH MOOR.—Dec. 14.—For Construction of the Green Withens Reservoir and Catchwaters, for the Wakefield Water Supply. Mr. Henry Rofe, Engineer, 8 Victoria Street, Westminster.

ROCHESTER. — Dec. 21.—For Additions to Municipal Buildings. Messrs. Goldsmith & Gosling, Architects, 10 Gray's Inn Square, W.C.

RUABON.—Jan. 1.—For Building Policeman's House, Upper Ponkey. Major T. J. Leadbetter, County Buildings, Wrexham.

RUSHTON.—Dec. 18.—For Building School and Schoolhouse. Messrs. Gotch & Saunders, Architects, 1 George Street, Kettering.

SHIBDEN.—Dec. 16.—For Building Eight Houses. Mr. J. F. Walsh, Architect, Waterhouse Chambers, Halifax.

ST. JAMES'S PARK.—Dec. 15.—For Superstructure, Block 1, Admiralty Buildings. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

SUNDERLAND.—Dec. 12.—For Building Infirmary. Mr. J. W. Donald, Architect, Russell Chambers, King Street, South Shields.

WAKEFIELD.—For Building Shops, Houses and Warehouses. Mr. Wm. Watson, Architect, Barstow Square, Wakefield.

WALLSEND.—Dec. 16.—For Additions to Railway Station, &c. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

WALSALL.—Dec. 22.—For Building Board Schools, The Pleck. Mr. H. McConnal, Architect, 2 The Bridge, Walsall.

WELCOMBE.—Dec. 21.—For Building Hermitage. Mr. Joseph Yeardye, Architect, 6 Fortescue Place, Ilfracombe.

TENDERS.

ABERGAVENNY.

For Building Attendants' Dormitories at Joint Counties Asylum, Abergavenny. Mr. ALFRED SWASH, M.S.A., Architect, Newport, Mon. Quantities by Architect.

J. G. THOMAS, Lion Street, Abergavenny (*accepted*)	£885 0 0

Nine tenders received.

BLACKBURN.

For Building for conducting Burial Service at Workhouse, in connection with proposed Cemetery.

J. Dyson & Sons, Blackburn	£170 0 0
J. Whittaker, Blackburn	167 0 0
W. H. Sims, Blackburn	159 0 0
J. W. Mitton, Blackburn	150 10 0
LEWIS & SONS, Great Harwood (*accepted*)	140 0 0

BROMSGROVE.

For Improvement Works, Plymouth Road, Barnt Green, Bromsgrove.

J. Biggs, Birmingham	£1,860 0 0
R. Fawcett, Atherstone	1,811 13 0
G. Trantham, Handsworth	1,346 0 0
Currall & Lewis, Birmingham	1,325 0 0
Jones & Fitzmaurice, Birmingham	1,293 0 0
G. Law, Kidderminster	1,227 0 0

CAVERSHAM.

For Private Streets Improvement Works, Caversham. Mr. W. WING, Surveyor.

Oxford Street.	
Bridgeman	£202 15 0
F. TALBOT (*accepted*)	190 17 9
Chester Street.	
Bridgeman	163 0 0
F. TALBOT (*accepted*)	152 16 3
North Street.	
Bridgeman	130 0 0
F. TALBOT (*accepted*)	91 4 9
South Street.	
F. Talbot	114 4 4
BRIDGEMAN (*accepted*)	93 0 0

CARDIFF.

For Building Premises for Messrs. Morgan & Co., in The Hayes, Cardiff. Mr. PETER PRICE, Architect, Cardiff. Quantities by Architect.

Jones Bros., Cardiff	£5,350 0 0
Burton & Co., Cardiff	5,271 0 0
D. G. Price, Cardiff	4,950 0 0
Stephens, Bastow & Co., Bristol	4,800 0 0
Harry Gibbon, Cardiff	4,600 0 0
TURNER & SONS, Cardiff (*accepted*)	4,568 0 0

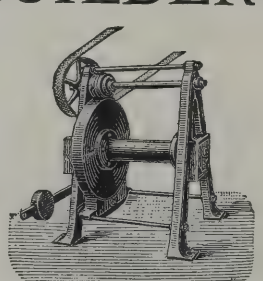
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Turner & Son, Cardiff	4,354	0	0
T. R. WATERMAN, Cardiff (*accepted*)	4,256	10	0

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A. King & Son, Gloucester	1,978	0	0
C. A. Channon, Cheltenham	1,890	0	0
T. Collings, Tewkesbury	1,830	0	0
Joseph Coombe, Pershore	1,717	0	0
A. & C. Billings, Cheltenham	1,650	0	0
C. Malvern & Son, Cheltenham	1,645	0	0

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J. ROBINSON (*accepted*)	161	10	0

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Bain & Co., Dundee	7,517	16	3
J. Leith, Aberdeen	7,057	5	10
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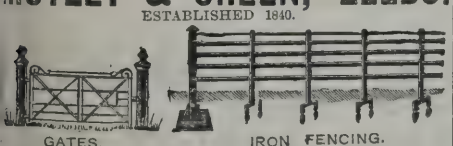
Hobson & Son, Nottingham	£2,898	0	0
Gilbert & Gabbitas, Nottingham	2,855	0	0
J. Dove, Hucknall Torkard	2,850	0	0
E. Hind, Nottingham	2,811	0	0
G. Hopewell, Basford	2,740	0	0
J. Munks, Hucknall Torkard	2,720	0	0
J. Hutchinson, Nottingham	2,650	0	0
T. Barlow, Nottingham	2,623	0	0
J. Cooper, Nottingham	2,550	0	0
B. Keeling, Nottingham	2,540	0	0
G. Bell & Son, Nottingham	2,529	0	0
W. Pinkett, Bulwell	2,520	0	0
G. A. Pillatt, Nottingham	2,470	0	0
J. G. Thomas, Nottingham	2,420	0	0
F. Wartnaby, Nottingham	2,400	0	0
F. Evans, Nottingham	2,395	0	0
J. Hopcroft, Nottingham	2,367	0	0
J. BROWN, Long Eaton (*accepted*)	2,297	0	0

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J. Bradley, Lincoln	678	10	0
S. DORE, Hucknall Torkard (*accepted*)	418	0	0
R. Stainforth, Hucknall Torkard (one section)	315	0	0
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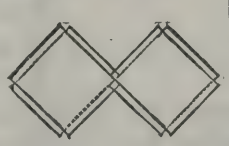
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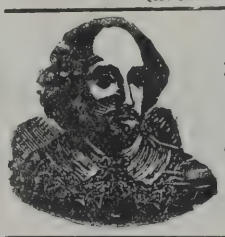
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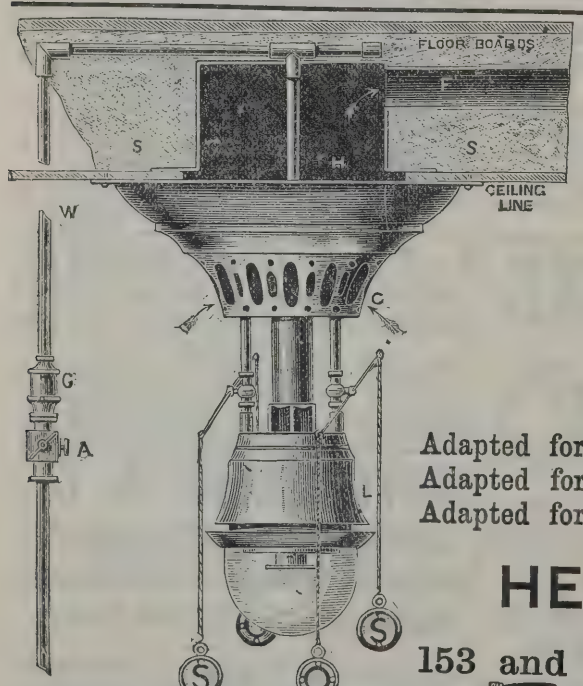
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VARIETIES.

THE *Canadian Architect* says:—The architect and decorator desirous of learning how to secure the most pleasing colour effects, might profitably have spent a few of the latter days of October in studying autumn foliage in its unusually varied and brilliant aspects.

THE same journal says:—The inspector of buildings and the chief of the Fire Brigade have recently been engaged in making an examination of the public buildings of Toronto, with a view to determining whether sufficient means of exit exist. The report has not yet been published, but from private sources it is learned that some buildings in which large congregations of visitors daily assemble have been found to be dangerous in this particular.

THE annual dinner of the Leeds Association of Engineers was held at the Queen's Hotel, Leeds, on Saturday, the 5th inst., Mr. A. Tannett Walker presiding. Professor Boddington, Yorkshire College, in proposing "The Clergy,"

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said the toast ought to be especially welcome in a society of engineers. They might not be aware of the fact, but between the engineering profession and the profession of ministers of religion a curious connection existed. The engineering profession was really an offshoot of the clerical profession. He admitted that it was a long time since the two were combined, but still, combined they undoubtedly were. In ancient times learning was the prerogative of the clergy, and the engineering work required to be done among the primitive people had to be done by the clergy. And if they went back more than two thousand years to the history of ancient Rome, they would find that the clergy were dignified by the significant name of bridge-builders. The professions had been to a certain extent differentiated since that time, and he dared say Dr. Talbot (vicar of Leeds) was very glad he had nothing to do with calculating stresses and strains or bridging the Aire, and without any disrespect to the clerical profession, he would venture to say that the travelling public were more confident in the matter of bridges because they were designed by such men as Sir Benjamin Baker than they would be if designed by Dr. Talbot, or even by the Archbishop of Canterbury or Mr. Spurgeon.

IT has been decided to acquire the Masonic Hall at Harborne for the purpose of a free library.

AT a meeting of the Markets Committee of the Leeds Corporation the proposal to roof in a portion of the uncovered ground lying between the entrance near the George Hotel and the Fish Market came up for consideration. After discussion, the committee resolved to adopt a plan, founded on the same principle as the roof of the new Midland Station at Bradford, which involves an expenditure of about 4,000*l.*

THE Burslem Town Council intend to make application to the Local Government Board for sanction to borrow 4,000*l.* for the purchase of property in St. John's Square, Hanover Square, and Furlong Passage, required for street improvements.

THE Parks Committee, Glasgow, have recommended the Corporation to acquire about 35 acres of the lands of Mosesfield, at 400*l.* per acre, and about 13 acres of the adjoining property of Cocksmuir, at 300*l.* per acre, for the purposes of a recreation-ground for the Springburn district of the city.

AT the meeting of the Birmingham Association of Students of the Institution of Civil Engineers, held at the Midland Institute, the president, Mr. J. Edward Willcox, in the chair, a paper was read by Mr. H. Hyatt on "The Testing and Manufacture of Portland Cement."

A NEW vestry is about to be erected for St. Patrick's Roman Catholic Cathedral in Armagh, for which the measurements have been taken by Mr. Hague, architect, Dublin, and thirteen statues for the niches in front of the cathedral are coming from Italy.

THE construction of a promenade pier at Dover has just commenced. The pier will extend seawards for 1,000 feet.

THE Mersey and Irwell Joint Committee have approved the draft of a Bill for conferring additional powers on the committee for the more effectual prevention of river pollution.

INTELLIGENCE has been received in Glasgow of the death in Chicago of Mr. D. G. Hoey, a well-known citizen of Glasgow. A strong inclination towards mechanics led him to turn his attention to the ventilation of public and private buildings, and he gave up the business of an accountant and devoted himself to the perfection of the system of ventilation which he had introduced. To enable him more effectually to do this he removed to London. His visit to America was in connection with the improvement of the ventilation of the underground section of the Baltimore and Ohio Railway.

THE Glasgow Association of the students of the Institution of Civil Engineers have just held their first general meeting in the Institution Rooms. Mr. W. R. Copland, the president, in an opening address, treated of the training and education of young engineers, and gave some advice for their guidance and success in the profession.

AT the first meeting of the newly-constituted Trinity Hospital Committee of the Edinburgh Town Council the convener, Councillor Colston, inaugurated his term of chairmanship by disclosing a scheme, which he has resolved upon, for extending the benefits of the charity by raising 10,000*l.* for the establishment of cottage homes.

THE great height of many buildings already erected in Chicago, and the fabulous number of storeys contemplated by the plans of a new Oddfellows' Temple, have brought to a point the agitation against such structures. On one day recently five permits were taken out for the erection of buildings 16 storeys high, to cost in the aggregate 600,000*l.* That evening the City Council met and directed the Commissioner of Buildings to give no permits for structures exceeding 12 storeys, until the question of limiting height is discussed and finally settled.

AT the meeting of the Rochdale Town Council, the chairman of the Health Committee said that during the last quarter

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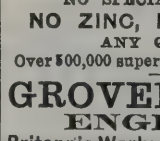
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ANCASTER, NEAR GRANTHAM.

the smoke-production by manufacturers in the town had been reduced 24 per cent.

AT the meeting of the exhibition committee of the Southport Centenary Celebrations Committee it was stated that the spring exhibition would be closed on May 14, in order that it might not clash with the Centenary Exhibition of Fine Arts; that Mr. Agnew had consented to lend a number of his own private collections, and also to inaugurate a unique exhibition showing the development of the art of pottery.

BUILDING AND BUILDERS.

SCARCELY a week, the *Canadian Architect* (Toronto and Montreal) says, passes during the building season that is not marked by serious injury or loss of life by reason of defective scaffolds. It is unfortunately true that the responsibility for most of these accidents rests with the workmen themselves rather than with their employers, and for this very reason it is impossible to guard against their recurrence. The workmen themselves construct the scaffolds, and should see that in point of material and construction they possess the necessary margin of safety. Reckless overloading of scaffolds has probably led to most of the accidents.

AN addition to the Nurses' Home at the Western Infirmary, Glasgow, which has recently been extended so as to accommodate the whole nursing staff, has been opened. The extension consists of three new flats, which contain forty-seven additional rooms, and the cost, including furnishing, amounts to about 10,000*l.*

AT the annual meeting of the Ayr Guildry Court Captain Girvan, master of works, was unanimously elected Dean of Guild.

IT is proposed to convert the Mechanics' Institute, Heckmondwike, into a technical school. Local architects have been invited to send in plans for altering the building.

THE *Leeds Mercury* says:—A staff of men are at present engaged improving the sanitary arrangements of the Town Hall, under the direction of Dr. Cameron, the medical officer of health. These measures are, however, only temporary, and the Corporate Property Committee contemplate a much more extensive scheme in substitution for that which, though it answered its purpose when the building was erected, is now out of date.

THE Edinburgh Dean of Guild Court have granted a warrant for alterations and additions at the Balmoral Hotel. The alterations consist of the demolition of the present back buildings, and the erection in their place of a restaurant and drawing-room on the ground floor, a dining-hall on the first floor capable of accommodating 250 people, and three flats of bedrooms above.

A RECOMMENDATION of the Wedgwood Institute Committee, that plans of additional buildings, estimated to cost 1,800*l.*, be approved of, so far as relates to the general arrangements, has been adopted by the Burslem Town Council.

A NEW Board School is to be built near Thornton for the Dysart Landward School Board, N.B.

TRADE NOTES.

THE Alliance Assurance Company's offices, Shrewsbury, are being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

A NEW church has been erected at Bromwich, and the ventilation has been carried out by the Climax Ventilating Company, of 15 Great George Street, Westminster, one of their direct-acting turret ventilators, specially designed to harmonise with the general features of the church, being fixed at the intersection of chancel and nave. The work has given the utmost satisfaction, all down-draught being effectually prevented.

THE architects for the Leeds and County Liberal Club have entrusted the order for the ventilation to Messrs. Baird, Thompson & Co., ventilating engineers, London and Glasgow. The ventilation of the large Catholic church of St. Mary's, Burnley, carried out by this firm, has given the greatest satisfaction, and the Rev. J. Morrisey has written Messrs. Baird, Thompson & Co., expressing his gratification at the efficient results. The whole of the ventilators are entirely concealed, and a complete and efficient system of ventilation has been carried out without draughts.

AT the monthly meeting of the Halifax Town Council it was reported that the Markets Committee had accepted the tender of Messrs. George Townsend & Son, for 2,940*l.*, for joiners and carpenters' work in connection with the new arcade and shops, in consequence of the withdrawal of Messrs. Fielding

ALL KINDS OF TILES FOR FLOORS WALLS HEARTHS GRATES CHEEKS BATHS &C.
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& Bottomley. Messrs. Charnock & Sons having refused to sign the contract for the excavators, masons and bricklayers' work for the arcade and shops, that of Messrs. Birkby & Sons, Wyke, for 6,520*l.*, had been accepted by the committee. The Board of Works Committee had accepted the tender of Messrs. G. & H. Tyson, for 2,919*l.*, for an intercepting sewer in Queen's Road.

AT a recent meeting of the directors of the Highland Railway Company contracts were accepted for the third and fourth sections of the new Aviemore line, extending from Strathnairn to the Inverness side of the river Findhorn. For the first section—a distance of over eleven miles—the offer of 87,129*l.*, by Messrs. John Ross & Son, was accepted. The fifth section, consisting of the masonry of the great viaduct over the river Findhorn, was entrusted to Messrs. Wm. Alexander & Co., Inverness, whose offer amounted to 24,264*l.*

AT the meeting of the sub-committee of the Cleaning and Lighting Committee, Edinburgh, *re* the refuse destructor, Mr. Howden, engineer, Glasgow, gave an explanation of his plans for the erection of a destructor at Powderhall, with the hot-blast application. The work for the erection of the destructor alone is estimated at 3,300*l.*

THE Christiania municipal authorities have concluded a contract with a Nuremberg firm for the supply of the necessary machines, accumulators and cable for lighting the city by electricity. It is stated that the cost of the appliances amounts to 750,000 marks.

THE Nottingham Town Council have empowered a special committee to spend 25,000*l.* to 30,000*l.* in lighting a central section of the borough by electricity.

THE Wednesbury Town Council have passed a resolution, "That the following clause be inserted in all contracts entered by the Corporation :—The contractor must not pay to the work-people he employs on the work contracted for less than the minimum standard rate of wages current in the district in which such men are employed. This condition to apply also to any work he may sub-let."

MR. JOHN GRUNDY, of 30 Duncan Terrace, City Road, London, N., and Tyldesley, is supplying his warm-air ventilating grates to Mount Zion Church, Clerkenwell, E.C.

MESSRS. GILLETT & JOHNSTON, clockmakers and bell-founders, of Croydon, have just succeeded in obtaining the order for a large turret clock and bells for Pietermaritzburg Town Hall, Natal. The clock is to be constructed to strike the hours on a large bell, to chime the Westminster quarters on four others, and to show the time on four 8-feet 6-inch dials. It is to have all latest improvements, and will, in fact, be almost a facsimile of the clock, &c., which the same firm are now making for Eastbourne Town Hall. Messrs. Gillett & Johnston have at present in hand two large clocks for Kurrachee clock tower (India) ; and, amongst others, large clocks for Epsom College, Parkwood Convalescent Home, Caledonian Road Baths, London, &c. They have just completed rehanging the bells at Newnton Longville parish church, where they are now engaged in fixing-up a new turret-clock which they have supplied.

AT a special meeting the York City Council adopted a recommendation of the committee having charge of the new sewerage scheme, in favour of the acceptance of the tender of Mr. Abraham Kellett, of Ealing, for the completion of sewerage contract No. 2 for 75,830*l.* 16*s.* 4*d.* (the amount of his original tender), subject to the deduction of an amount to be agreed upon between Mr. Kellett and Mr. Mansergh, C.E., in respect of the work executed by Mr. Bottoms.

AT a meeting of the Works Committee of the Aberdeen Harbour Board, the tender of Messrs. John Rust & Son, amounting to 842*l.*, was accepted for the extension of the wharf in Albert Basin.

NEW CATALOGUES.

AN illustrated catalogue has just been issued by Messrs. Woodhouse & Rawson United, Limited, 88 Queen Victoria Street, London, E.C., for the coming year, of electrical machinery and apparatus connected therewith, including engines, dynamos, accumulators, lamps, switches, fittings, instruments, &c. The section (Section 8, List "B") contains prices of steam and electric cranes, lathes, drilling machines, tube welders, &c. The catalogue opens with details of this firm's steam and electric cranes and winches for all requirements. Subsequently machinery for mining, pumping, drilling, coal-cutting purposes, circular saws, lathes, planing and high-speed drilling machines, &c.

WE have received an illustrated catalogue just prepared by Messrs. W. Summerscales & Sons, of the Phœnix Foundry, Keighley, Yorks, of their high-class modern laundry machinery, and all appliances connected with the same. The recognition received by Messrs. Summerscales & Son of the excellent of

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With Lifting Fire.
WORKS, ROTHERHAM. Estab. 1854.

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Exeter Cathedral	Eddystone Lighthouse
Llandaff ,,	Birmingham Municipal Buildings
Wells ,,	Hove Town Hall
Sligo ,,	Burnley, Holy Trinity Church
Bradford Town Hall	Crawley Parish Church
St. James's Palace, London	Corbridge-on-Tyne Parish Church
Sherborne Abbey	Windermere Church
Sydney Town Hall, N.S.W.	Eiffel Tower, Paris
Durban Town Hall, S.A.	

Royal Military Exhibition, &c., &c., &c.
GOLD MEDALS—HUDDERSFIELD, 1883 ; LONDON, 1885.
SILVER MEDAL—PARIS, 1889.

their machinery has encouraged them to spare neither effort or expense in placing many new machines before the public. The catalogue contains over seventy pages, so it is easy to conclude what a large variety of appliances is comprised under the simple title of laundry machinery.

THE GAS SUPPLY OF LONDON.

THE Board of Trade has undertaken to appoint a committee to consider what the standard of light for testing the gas supply of London should be, the present candle standard having been found to be very untrustworthy. The appointment of the committee, which will be composed of scientific men, has been delayed because the Board of Trade and the London County Council have no fund available for paying the expense of a committee, while the London gas companies refused to undertake the cost. The South Metropolitan Gas Company, of which Mr. G. Livesey is chairman, have now undertaken to pay the whole of the expenses, and the committee will very shortly be formed. It will consist of two members nominated by the County Council, one by the City Corporation, three by the London gas companies, together with the three gas referees and two independent scientific men. Dr. E. Frankland, F.R.S., and Mr. Dibdin, the Council's chemist, will represent the London County Council. Pending the report of this committee, the Council has deferred action in the direction of obtaining legislation for a more exact standard of light.

THE TAXATION OF GROUND VALUES.

A CONFERENCE on this subject has been held under the presidency of Lord Herschell in Toynbee Hall. Mr. Fletcher Moulton, Q.C., opened it by moving a resolution to the effect that a separate rate ought to be levied upon the value of land in towns, to be paid by the owners of the respective ground values. The importance of the question, he said, could hardly be exaggerated. The arguments in favour of the view he was supporting would by that time be familiar to many, but must be repeated until their force was widely acknowledged. He then enlarged upon the reasons why it was expedient and necessary that there should be direct taxation of the land in towns, and that this should form a considerable portion of municipal revenue. He dwelt upon the enormous increase in the value of town land, remarking that such increases were most marked in the world which spoke the English language. In the course of the discussion that followed, the chief difficulties besetting the matter were pointed out, and Mr. Moulton, in reply, dealt with each of these at some length. It had been contended that the proposed change would not make any difference to the occupier, as what the landlord had to pay in additional rates would be put on to the rent. Mr. Moulton admitted that such might be the case at first, but he was convinced that under the new order of things which they sought to set up the argument would turn out to be based on a complete fallacy. Lord Herschell, in proposing a vote of thanks to Mr. Moulton, briefly reviewed the opinions expressed that evening without offering any of his own, and the meeting soon afterwards came to an end.

ARBITRATION IN CONTRACT DISPUTES.

THE Court of Appeal have determined a question which affects the arbitration clause in contract deeds. The plaintiff, Mr. Eyre, in October 1888 obtained a contract for the construction of a main sewer in Leicester. There was among the conditions a provision for the reference of disputes to arbitration, and the award was to be made by the "arbitrator or umpire to be appointed." A dispute having arisen after the completion of the work, the plaintiff called upon the defendants to appoint an arbitrator. They denied that the case was one for arbitration, and refused. He then sent them a notice to concur with him in the appointment of a sole arbitrator to act in the matter for the purposes of the arbitration, and that in default he should apply to the Court to make the appointment under the Arbitration Act, 1889. The defendants refused to comply, and the plaintiff accordingly applied at Chambers for an order appointing an arbitrator. His application was refused by the Master and the judge, but was granted by the Divisional Court. The defendants appealed.

The Master of the Rolls said that he agreed with the Divisional Court that there was here an agreement to submit any disputes to the arbitration of a single arbitrator. Therefore, when a dispute arose either party might under section 5 of the Arbitration Act, 1889, serve the other party with notice to appoint an arbitrator. A dispute had arisen, for it was admitted that part of the plaintiff's claim was within the arbitration clause in the contract. It was

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ARTHUR L. FOLEY,
SECRETARY (pro tem).

48 Queen Victoria Street: November 1891.

said that the notice which the plaintiff had given was wrong because it did not call on the defendants to appoint an arbitrator, nor did it call on them to concur in the appointment of a named arbitrator. That objection was too fine and too technical, and could not be countenanced. The question therefore arose as to the power and duty of the Court in such a case. There was a dispute within the submission ; the proper notice had been given and had not been complied with. The Act said that in such a case the Court "may" appoint an arbitrator. It was contended that that gave the Court a discretion, but in his opinion "may" must be read as meaning "must." When the parties had agreed to submit disputes to arbitration, and such disputes had arisen, and one of the parties had refused to concur in appointing an arbitrator, it would be monstrous if the Court could, by refusing to appoint, force the parties to go to law. He disagreed, therefore, with the Divisional Court, who had sent the matter back to the Master to decide whether there should be an arbitrator or not. All that the Master could do would be to say who the arbitrator should be. The order would, therefore, be varied in that respect.

Lord Justice Lopes concurred.

Lord Justice Kay thought that in this case the Court, even if it had a discretion to refuse to appoint an arbitrator, ought not to exercise that discretion. He, therefore, concurred in the decision, but he wished to guard himself from saying that in every case under the Act "may" must be read as equivalent to "must."

THE SANITARY ARRANGEMENTS OF MANCHESTER.

AT the last meeting of the Manchester Medico-Ethical Association Dr. Tatham, medical officer of health for the city, read a paper on "The Laws and By-laws Regulating the Sanitary Arrangements of the City of Manchester." He said that the bulk of the old part of Manchester was built at a time when, he feared, there were no by-laws. Otherwise he could not believe that such a network of narrow streets, blind alleys, tunnelled passages and filthy slums could have been perpetrated as those which were to be found almost anywhere in the older parts of the city. The building by-laws which were in force from the year 1868 up to about twelve months since certainly needed amendment. That this was so had been fully recognised by the Corporation, and it was said that the new by-laws which had just seen the light had been undergoing the process of incubation for a period of well-nigh ten years. Of these new by-laws it deserved to be said that they were the best set of building by-laws possessed by any Corporation in England. His only fear was lest a certain class of Manchester builders might be able to bring such pressure to bear on the Corporation as to induce them to relax in some respect the stringency of these by-laws, and thus to bring about a return to the old state of things. They were told that the present by-laws in respect to their maximum requirements of air spaces and strength of materials were unworkable, and would prevent the erection of labourers' dwellings in the business parts of the city. His answer to this charge was that the building by-laws were adopted in their present form after the most patient and anxious consideration by the Council in consultation with the chief architects, builders and others who were thought to be able to give useful advice with respect to them. Also that the new by-laws had received the approval first of the Local Government Board and subsequently of Parliament itself ; and that if it turned out that they made jerry property building impracticable so much the better for the prospective dwellers in the city of Manchester. He did not hesitate to declare his conviction that the policy which should guide sanitary authorities all over the country in providing dwellings for the labouring classes was not that of the crowding together of cottage dwellings in the close and confined areas of our great towns merely because they would be convenient of access to workpeople. The wise and only safe policy was to destroy the rookeries and dungeons miscalled dwellings in the slums of our congested districts, and to force the people, or most of them, to seek a dwelling-place outside the congested area where building land was cheap and where houses were or should be healthy, and to follow up those workpeople with cheap tram fares and cheap railway tickets. It was obvious that sanitary authorities could not go, and they would not be wise in attempting to go, very far in advance of public opinion. He greatly desired that public opinion should rise to something like a worthy conception of the duties which society owed to its less fortunate members, and he had accordingly always held that one of the most useful functions which a medical officer of health could discharge was that of educating the people in matters of their personal health. He expressed the hope that in endeavouring to carry out this important part of his duty he might have the actual co-operation of his colleagues in the medical profession.

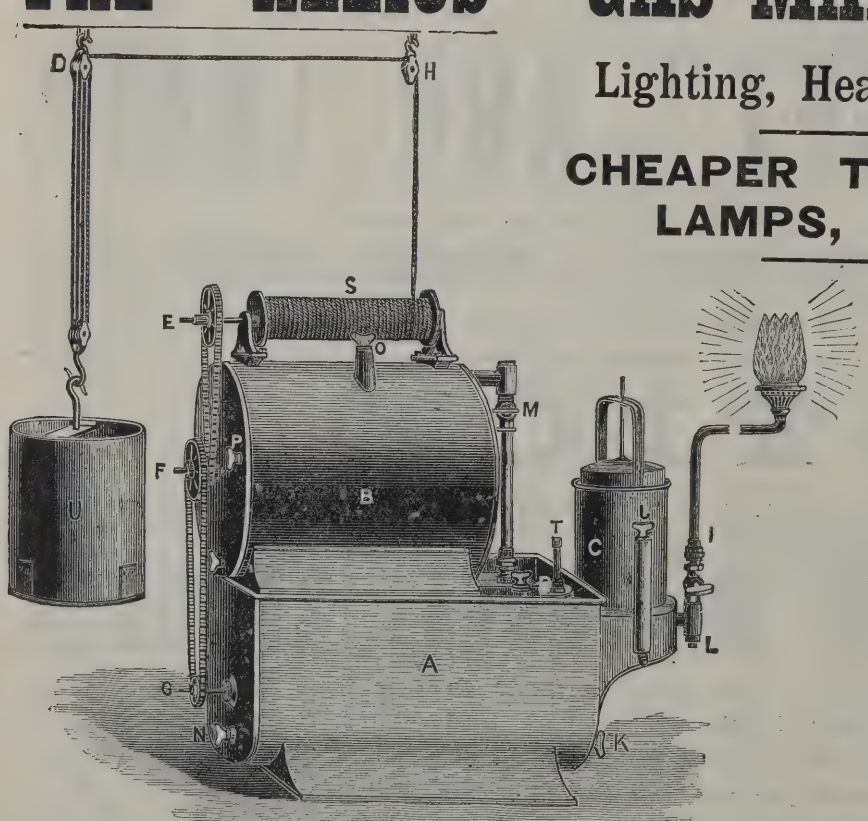
Dr. Braddon moved a vote of thanks to Dr. Tatham for his paper.

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Dr. Emrys-Jones, in seconding the motion, remarked that the position of medical officer of health should be as independent as possible.

Alderman Bailey said the jerry builders usually did what they could to become the masters of the man who was their critic and judge. It was very desirable, as Dr. Emrys-Jones had remarked, that the medical officer should be in an independent position.

Mr. Councillor M'Dougall said there was no fear that the Corporation would relax the new by-laws.

Dr. R. C. Smith suggested that a number of the empty old mills in Ancoats should be pulled down and their sites utilised as open spaces. He suggested that every house in Manchester should be visited at least once a year and certified as being in a sanitary condition.

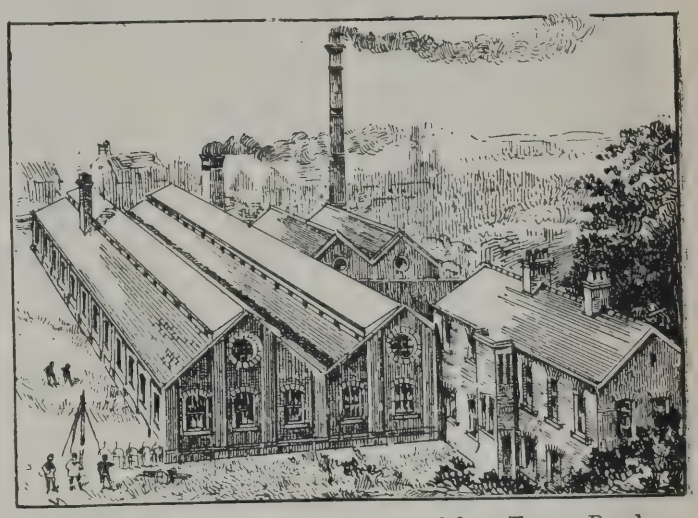
SANITARY INSPECTORS' ASSOCIATION.

AT the monthly meeting of this Association, held at Carpenters' Hall, an address was delivered upon "The Public Health (London) Act, 1891," by Mr. E. Lewis Thomas, M.A. (honorary counsel to the Association). Mr. Thomas dwelt at some length upon the codification, modification and consolidation of the several Acts which had been included in the Public Health Act, and said it provided for London a sanitary code similar to that which in 1875 was given to the rest of England and Wales by the provisions of the Public Health Act, 1875. Since the year 1875 several attempts had been made to codify the sanitary enactments in force in London. In 1877 a Bill with that object was introduced into the House of Commons by Lord Basing, then Mr. Sclater-Booth, the president of the Local Government Board, a similar measure being brought into the House of Lords in 1885 by Lord Salisbury. Both these attempts to deal with the matter were unsuccessful, and it was not until 1891 that there was accomplished for sanitary administration in London, with its five million inhabitants, that which had been done sixteen years before for the remainder of the country. The Act applied to the whole of the administrative county of London as defined by the Local Government Act, 1888, the City of London being in the same position, with one or two exceptions, as the other sanitary districts within the metropolis. He thought the Act was one which would prove of great advantage to Londoners.

ART METALWORK.

THE taste for artistic metalwork has increased amazingly during the last few years, as evidenced by the numerous wrought-iron gates and other ironwork which we see in many parts of the town and country, which have taken the place of much of the unsightly and brittle cast-iron which was so greatly used. The design and finish of the gas and electric fittings, staircases, &c., in all our new public buildings have much improved, and are really works of art in many cases.

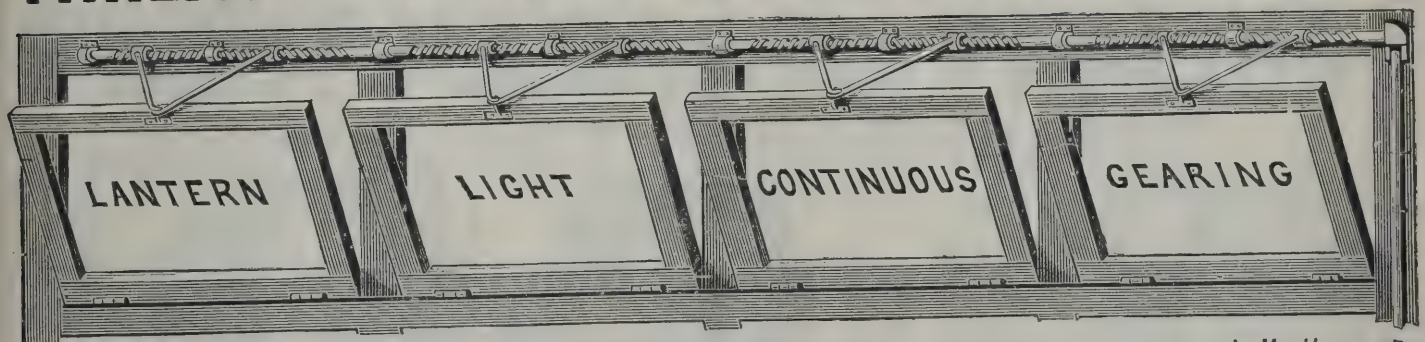
We had the pleasure last week of visiting the new factory which Messrs. Jones & Willis, the well-known and old-established firm of art metalworkers and church furnishers, have



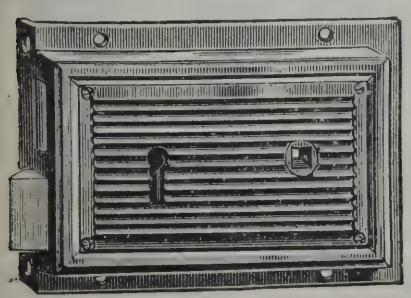
built at Hornsey, they having now removed from Euston Road, where they had been many years, as they found it too small for their increasing business. The new works are within five minutes' walk of Hornsey Station, G.N.R., and close to the old parish church. The works, which are all on one floor, stand in two acres of ground. Mr. Herbert Willis, who superintends the metal department of the firm (by whom we were courteously received), first showed us the draughtsman's office, a very light and spacious room; passing through the other offices, we

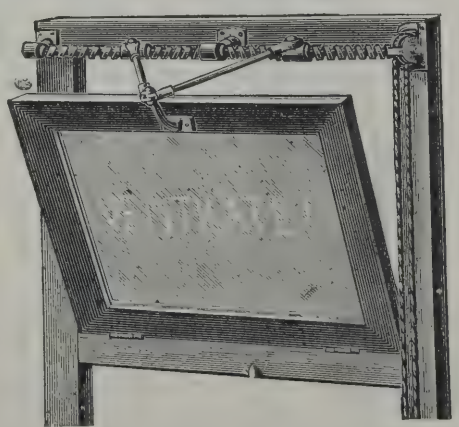
JAMES HILL'S PATENT

FANLIGHT OPENERS & REVERSIBLE LOCKS.

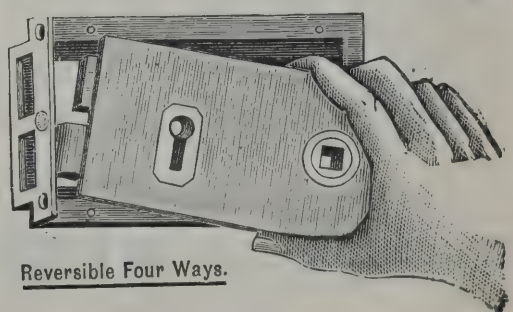


Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod.





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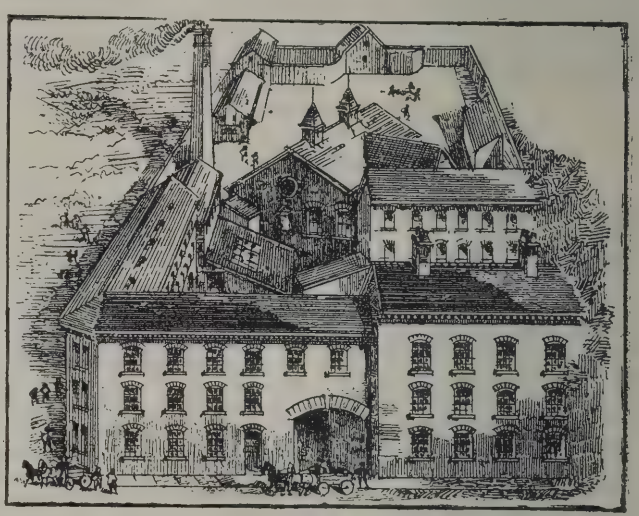
JAMES HILL, 100A QUEEN VIC TORIA STREET, LONDON, E.C.

arrive in what is called the rough warehouse, in which are kept bar iron, brass and copper sheet, metal tubes, brass castings in the rough ready for working up, thousands of patterns of all sorts and sizes for making into brass goods, such as scrolls and leaves, eagles and angels for lecterns; another warehouse being set apart for goods made up in the rough, ready for finishing. Next we visited the brass shop, in which gasaliers and electroliers were being made, several eagle lecterns in all stages of finish, some of which were very handsome and others of a less ornate character. Adjoining s the polishers' shop, where all the brasswork is polished by machinery, a very interesting process. After that the brasswork is taken into the lacquering-room, where it is heated on stoves, and a clear lacquer is applied to exclude the air from the brass and so that it may keep its beautiful colour. We were then taken to the silver shop, where the communion sets, alms dishes, vases, &c., are made; among others we noticed a very handsome silver chalice and paten in process of making; it was relieved by some very rich *repoussé* work. We were particularly interested with the next shop, the engravers'; on the walls we noticed rubbings of some handsome brasses recently executed, one being to the memory of Colonel King-Harman, and another elaborate one to Sir Evan Morris. Several brasses were in course of execution, communion sets and numerous other articles in silver and brass were being engraved. The foundry next took our attention, where parts of brass lecterns, gas-fittings, &c., were being moulded; we also saw two or three eagles in the moulders' hands.

The smith's shop is a very fine roomy place, and we noticed that a great number of smiths and fitters were at work on gates, railings, grilles and chancel-screens, the following being in hand or just completed:—Large iron screens for All Saints, Acton; St. Clement's, Fulham; St. Luke's, Leicester; St. Matthew's, Luton. We next saw parts of a staircase being executed under the supervision of Mr. Wm. G. Bartleet, and another for Messrs. Hine & Odger, of Plymouth; also gates and door furniture for Mr. Joseph S. Hansom, and a sign for Mr. George Thorp, and several gas and electric fittings.

As Hornsey is within easy distance of either the City or the West End, it will be very convenient for architects who entrust their work to Messrs. Jones & Willis to see their work in course of execution. We feel it would amply repay a visit from anyone who is interested in art metalwork.

Their works at Porchester Street, Birmingham, are extensive and well adapted to the manufacture of the wood and stonework which is executed there. The ground-floor contains the machinery specially designed to meet the requirements of their work, also the masons and marbleworkers' shops and packing-shops, above which are their joiners and woodcarvers' shops, in which we noticed they had in hand a quantity of work for many well-known architects, amongst which may be mentioned oak fittings for the interior of St. Mary's Priory Chapel at Princethorp, under the superintendence of Mr. Joseph S. Hansom. Also canopied priest-stalls for St. Cuthbert's Church, Kensington, to the designs and drawings of Messrs. Roumieu Gough & Roberts, and the whole of the interior fittings for two



cemetery chapels at Morden, Surrey, and several other works; in fact, from the staff of men employed by them, they must have the patronage of many of the architects in the country. Their appliances for timber-drying are such as to insure the timber used being thoroughly well-seasoned, as, after being dried in the open until it is as dry as it can be made outside, it is subjected to a heat of from 80 deg. to 100 deg. for some time before being used, and the large stock of oak, walnut and pitch-pine enables them to put in hand any quantity of work at a moment's notice, thus giving them an advantage over houses who keep small stocks.

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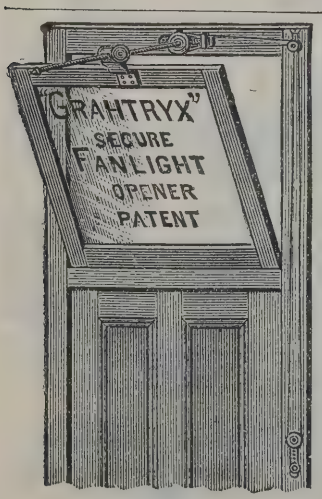


FIG. A.

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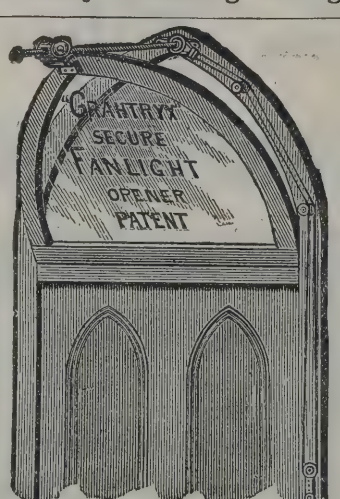
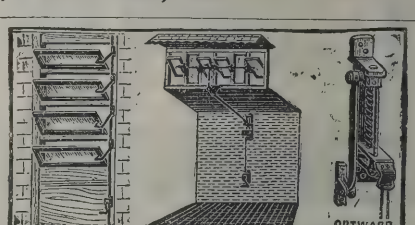


FIG. B.



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COLDBATH FIELDS PRISON SITE.

THE Postmaster-General, in a letter to Mr. R. Paget, vestry clerk of Clerkenwell, states that as it is now decided to retain the whole of Coldbath Fields prison site for parcel-post purposes, he would be willing to remove the old prison wall and substitute iron railings from the corner of Calthorpe Street to Oldham Gardens, Farringdon Road, setting them back to increase the width of the street to 60 feet, on condition that the vestry will reset the pavement and remake the road. Originally it was intended that the entire site of the disused prison should be utilised for industrial dwellings or maintained as an open space, but the sum of 10,000*l.* has been paid to the London County Council in lieu of the reservation of even a part of the land as a recreation-ground. Having regard to the fact that Clerkenwell has now in the enclosures of Wilmington and Northampton Squares two public recreation-grounds, besides a large playground for children at Spa Fields, it is thought that more open spaces in the parish are not needed, and that the 10,000*l.* would be more usefully employed as a contribution towards the erection of a town hall on the line of the new thoroughfare from Holborn to the Angel than in providing an additional pleasure or leisure ground.

ECONOMY IN VENTILATION.

THE ventilation of buildings has been for many years considered quite as essential a part in the production of a finished building as providing walls and covering them with a roof. The ventilation of a building or its separate rooms is easily secured most effectually if in somewhat of a primitive manner by throwing open windows or doors, or both together. Except in cases of airing a room at a time when it would not be used, the remedy was perhaps worse than the evil. Means of ventilation were then devised to obviate having recourse to the draughts from windows or doors to secure the replacement of vitiated by fresh air. By these means a different state of things was inaugurated. The draughts were as abundant as ever, but it could only be reckoned that they would not come through window or door ; but they still came. At last it seemed to be considered quite a problem how a building might be effectually ventilated without producing draughts. But that buildings can be ventilated, and the inside air kept pure and sweet as the outer air, without motion in the air being perceptible, is not to be denied. We have visited buildings which have been in full use, and the wonder has been how those within them could stand the combination of heated and vitiated air. Other buildings, again, have been as agreeable as the outer air which we had just left. In this latter case the success has been achieved by use of fans. No doubt this system has not been adopted so much as might be as it was considered costly. The problem of ventilating has therefore in many cases been assumed rather than believed to be insoluble. It may be as well to say that it is a mistake to consider this system is costly. The plan cannot be said to be on trial, as for some years past it has been found to be a cheap and effectual method, by use of the Crossley "Otto" gas engines. We have before us at the moment particulars of the ventilation of the Middle Public School in Aberdeen. There a Blackman fan 5 feet in diameter, propelled by a three-horse power nominal Crossley's "Otto" vertical gas engine, introduces a current of air of required volume to be dispersed through the building. The windows of the building cannot now be opened in summer or winter, and the fireplaces have also been abolished.

In winter the incoming air undergoes, on its way to the fan, the double process of cleansing and warming, the first process alone, of course, being necessary in summer. The cleansing is effected by means of a screen of Manilla hemp, the fibrous cords of which are kept moist by an occasional flush of water from an overhead trough. All particles of smut and dust are by means of this screen arrested on their way into the building, and washed off in due course. A coil of hot-water pipes stands outside the washing screen to protect it from frost, but the real warming of the air occurs when the screen is passed and the entering current comes in contact with the heat radiating from a still larger coil of high-pressure hot-water pipes occupying the chamber in front of the fan. These pipes are maintained at a good heat by a patent slow-combustion furnace occupying the adjoining furnace-room. The fuel used is gas-coke, costing much less than steam-coal. By the admixture of a slight current of air with the furnace-gases of the burning coke an intense heat is generated on a remarkably small consumption of fuel. In ordinary winter weather pure air, at a temperature of 60 degrees, is propelled by the fan into the main duct, from whence it finds its way by branch ducts up to the classrooms, at a temperature about 5 degrees less than this. At 55 degrees the air in the classrooms is temperately warm, and at the end of a two-hours' sitting the thermometer is usually found to have risen still further if the rooms are occupied by their normal



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complement of pupils. In extreme frost a smaller furnace, heating a secondary coil of hot-water pipes within the main air duct, gives the additional warmth needful for a very low external temperature. On the other hand, provision is made for immediately reducing heat in the classrooms without withdrawing fuel from the furnace—a most desirable thing in certain months of the year, when the alternations of temperature after sunrise are often rapid and unexpected. The whole has been applied from the plans of Mr. William Key, of Glasgow, who has so successfully engineered the ventilating and heating arrangements of the new Victoria Infirmary there, in which the machinery comprises an air-washing screen, steam coils for heating, and a duplicate set of Blackman fans, each driven by a Crossley's "Otto" gas engine. Mr. Key has also designed the slow-combustion furnace in the Middle School, the air-washing screen, and the compact system of coiling the hot-water pipes in a heating-chamber abutting on the main building.

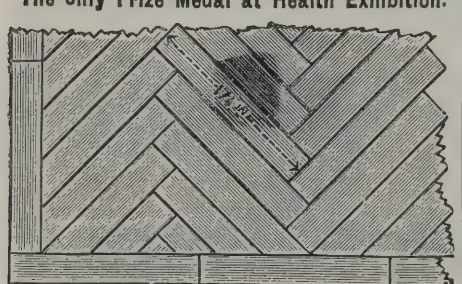
The outlet for the air after it has done its duty is most efficiently and skilfully provided for, though space will not now allow of describing the mode. As to the cost, the daily working expense of the system is made up of the supply of gas and of the necessary repair and oiling of the engine. An engine of the Crossley "Otto" type used in the Middle School, which the School Board has found by experience to be the most economical and reliable, and to require the least attention, will do the work required of it on a consumption of from 40 to 50 feet of gas per hour, and allowing for six hours' running per day, and for gas at 3*s.* 6*d.* per thousand cubic feet, the expense will be seen to be about 2*d.* per hour. Repairs and oil will not exceed 2*l.* or 3*l.* per annum. A school janitor will speedily familiarise himself with the working of the engine, which when started of a morning will work all day with little or no attention. Adding, therefore, to the current working expenses the interest on outlay, and the sum required as a sinking fund to repay original cost, it will be found that the expenditure on a school of 1,000 children does not exceed 25*l.* per annum, or about 6*d.* per head. The cost of heating under this system is, on the other hand, very much less. Sufficient time has not yet elapsed to permit of a winter's firing of the slow-combustion furnace before referred to, but enough has been seen to prove that in point of economy the furnace is a decided gain, and that in raising heat its action is rapid. If a building is designed at the first for this system the prime cost can be little. Even applying it to existing buildings cannot be of great moment, when we daily see houses and buildings practically one-quarter pulled to pieces to improve the appearance or possibly to gain a few feet more space in the rooms, &c. We are accustomed to this. By-and-by it will be as much a matter of custom to consider it the right thing to lay out money to secure the advantages of fresh air, which can be had by less trouble and less expense than is often bestowed on more dubious improvements.

Mr. William Key writes with reference to the Crossley's "Otto" gas engines :—"Two gas engines, each 4 horse-power nominal, were erected by you in the New Victoria Infirmary, Glasgow, and having designed and carried out the ventilating and heating of that building with pure washed and warmed air, propelled by fans driven by these engines, I can say that each engine was running for twenty-three and a half hours daily for over twelve months without the slightest hitch having occurred, only stopping one engine at a time for half an hour daily to cool and oil it thoroughly. It has been quite a pleasure to see them steadily and economically at work. The gas consumed by the engines was for the greater part of a year equal to 1·96*d.* for each million cubic feet of air propelled into the infirmary, and latterly was as low as 1·42*d.* per million cubic feet of air."

THE "SUNRAY" CONDENSING STOVE.

THE illustration shows the excellent heating-stove known as the "Sunray" condensing stove, the sole makers of which are Maughan's Patent Geyser Company, Limited, of 51 Queen Victoria Street, E.C., and 266 Sauchiehall Street, Glasgow. The stove is an apparatus for heating by gas in a highly economical way. In addition it may be said to be indispensable as a warming apparatus in numberless cases, where for many reasons other modes of heating are impracticable, and where hitherto the attempt to warm by artificial means has necessarily had to be given up. An objection to heating by employing gas-stoves has been that warmth has been secured by disagreeable accompaniments of smell and vapours from imperfect combustion, always unhealthy, and too often unbearable from the immediate production of a sickly atmosphere. As far as our experience goes, it is gratifying to be able to state that the "Sunray" is entirely free from these objections. The following are among the advantages that the company claim and rely on for success in the "Sunray." That it is the best and cheapest means of warming offices, rooms, shops, entrance halls, conservatories, public buildings, &c., being the

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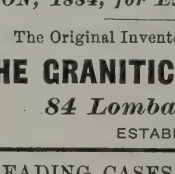


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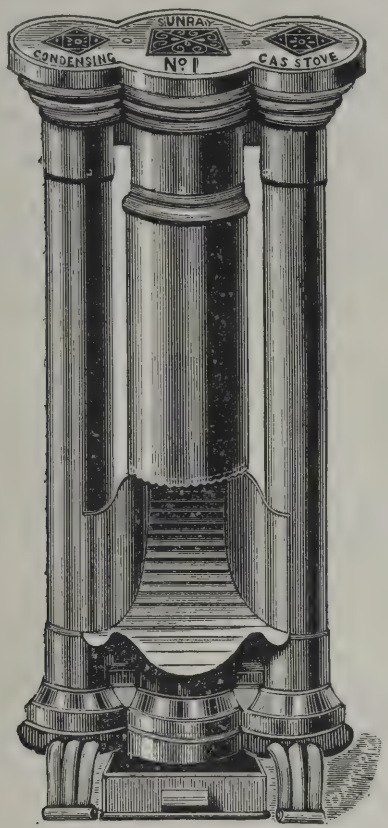
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most efficient and economical apparatus for heating by gas yet introduced. It has all the advantages of the ordinary gas fire, cheerful in appearance, and throwing the greater part of the heat downwards by direct radiation, effecting a saving of from

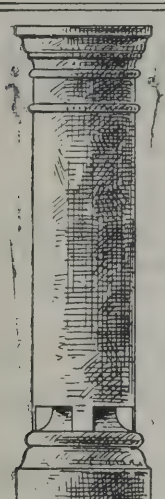


50 to 75 per cent. in gas consumption; no flue or chimney is required, and the whole of the heat produced is utilised. The gas is burnt under conditions securing perfect combustion, and any noxious vapours not consumed are condensed by contact with cold surfaces in the interior of the stove into a liquid form. That although condensing stoves in various forms have been before the public for some years, the great objection to them has been the absence of downward heat. That this objection is entirely removed in the "Sunray" condensing stove, which combines the advantages of both the radiating and the condensing principles. That there are also several minor difficulties with the condensing stoves hitherto made, such as breakage of glasses, difficulty in lighting, &c., all of which the "Sunray" stove obviates, as no glasses or chimneys are used, and the flame, being open, is lit and regulated as easily as any ordinary gas jet. That the "Sunray" stoves are handsome in appearance and very durable, being constructed of best materials.

The action is as follows:—Ordinary Bray's burners are placed near the bottom of the centre chamber. Just above is a plate of metal which becomes intensely hot, and reflects the heat downwards to the floor, and also improves the combustion of the gas, which is practically perfect. The products then pass up the centre chamber and down the side columns, where they come into contact with cold surfaces on which they condense. The liquid resulting falls into a loose tray placed beneath the stove. Tubes are placed inside the centre chamber and side columns, at the bottom of which the outside air enters, and, after being heated, is passed out at the top of the stove.

QUEEN'S GATE HALL.

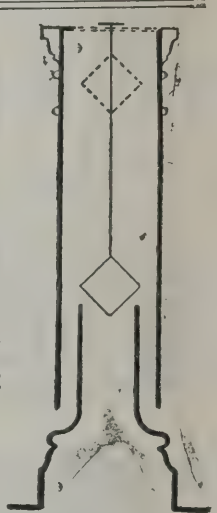
WE recently had the opportunity of inspecting a very successful installation of the electric light at the Queen's Gate Hall, Harrington Road, South Kensington. It consists of sixty-five lights, and the fittings are of charming design. The effect of the whole is most pleasing, an opinion confirmed by the manager of Queen's Gate Hall, Mr. Hallums, to whom and to the numerous visitors to the hall it has given every satisfaction. The lights are controlled from one switchboard, to which Mr. Hallums has access by a private key. The complete installation was executed within a week, a feat for which the contractors, Messrs. Barnes & Low, Sussex Place, South Kensington, deserve every praise. The firm have also carried out an installation for the eminent photographer, Mons. Jacolette, adjoining the Queen's Gate Hall, for photographic purposes. The fact of entrusting Messrs. Barnes & Low with such special work is in itself a strong testimony to their ability.



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REGISTRATION OF PLUMBERS.

LORD BASING, a past president of the Local Government Board and the most active promoter of the Public Health Act of 1875, is entitled to be regarded as an authority on sanitary matters. His lordship, in distributing at Southampton the other day a number of certificates of registration granted by the Plumbers' Company, London, said he felt very pleased that so large a number of those engaged in the trade in that part of the country had obtained the certificates. He had been interested in the subject for some years past, and had attended more than one meeting of the Plumbers' Company. The nation was at that moment in deep anxiety as to the health of a member of the royal family, whose illness, for aught they knew, might have been brought about by some defect in house-plumbing arrangements, which it was the object of the registration system to prevent and get rid of. The plumbing industry was essential to the health and comfort of dwellers in houses, and he thought it was high time for the nation to be aroused to the fact. He hoped the time had now arrived when certificates of competency on the part of the plumbers would be as much a matter of course as certificates of competency had for some time been on the part of pharmaceutical chemists. Lord Basing subsequently presented several prizes and certificates of merit given by the Plumbers' Company to successful students in the plumbing classes at the Hartley Institution, Southampton.

THE NEW RAILWAY TO LONDON.

SOME important changes have been made in the scheme for extending the Manchester, Sheffield and Lincolnshire Railway Company's system to London. The London terminus, instead of being placed on the somewhat awkward site offered by Boscobel Gardens, is to be brought forward to the Marylebone Road, and will thus front the same great thoroughfare as Euston, St. Pancras and King's Cross. Two new branch lines are proposed from the main line into the passenger station. One of these is to run out on the west, near North Bank, and, crossing Grove Road, is to terminate near Carlisle Street, in which neighbourhood a large area of property has been scheduled for a coal depôt. The other branch, commencing also on the western side, near the Alpha Road, is intended, running by an easy downhill gradient, to form a junction with the Metropolitan Railway under the Marylebone Road. In carrying out these works the company will of necessity be compelled to close up certain streets and roads, in exchange for which they propose to construct two new streets, giving access over the area affected. One of these, according to the plans, runs from Lisson Grove to Park Road; the other runs into the Marylebone Road near Harewood Street, and parallel with the new station. The arrangements as to the taking of property in St. John's Wood for the purposes of a goods station remain as they were last Session. Certain alterations have also been made in the country route, which will, it is believed, leave the scheme practically unopposed so far as the extra-metropolitan part of it is concerned, unless it should be found impossible to come to terms over the agreement with the Great Northern Company. Negotiations on this subject are now going on.

A special general meeting of the M.C.C. has been held, for the purpose of discussing the effects likely to follow from the terminus of the railway being built adjoining the ground. The president of the M.C.C. committee, Mr. V. E. Walker, occupied the chair.

Mr. H. Perkins, the secretary, supplied particulars of the business done. The committee of the M.C.C. have strenuously objected to the construction of a railway terminus abutting on the grounds, but before the Parliamentary Committee some months ago they failed to show that the ground would be in any way damaged, inasmuch as the proposed line would not pass through any of the cricket-ground property. By the clause in the Bill, Lord's Cricket Ground would gain a distinct advantage. as the railway company would grant extensions on the south side of the ground now occupied by the Clergy Orphan Society. As the railway company had now altered the site of the terminus to the Marylebone Road the circumstances were changed. The particular clause in the Bill to which the committee of the M.C.C. have raised opposition is as follows:—"To empower the company to purchase by compulsion or agreement certain lands and property in the parish of St. Marylebone and county of London, adjoining the ground belonging to the Marylebone Cricket Club, and belonging or reputed to belong to the corporation known as the Clergy Orphan Society, incorporated by the Act 49 George III. cap. 18, and to empower and require that society to sell the said lands and property which are shown on the plans deposited as hereinafter mentioned, for such price or consideration as may be agreed, or as the intended Act may prescribe, and to enable the company to convey the same, or so much thereof as may not be required for the purposes of the undertaking of the

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company, to the trustees of the Marylebone Cricket Club, in exchange for a certain portion of land belonging or reputed to belong to that club, or for rights in, over, or through such land required for the purposes of the intended railways, or one of them."

Mr. Denzil R. Onslow moved the following resolution :—"Believing that the parting of any portion of the freehold of Lord's Cricket Ground for the construction of the Manchester, Sheffield and Lincolnshire Railway would be fraught with the greatest danger to the interests of cricket generally as well as to the interests of the M.C.C., this meeting respectfully requests the committee of the M.C.C. to oppose the Bill with the utmost vigour at every stage of its progress before Parliament."

Sir Henry James, in speaking of the terms proposed by the railway company, said the company's proposals were very fair, and he failed to see how the committee of the M.C.C. had any *locus standi* in opposing the passage of the Bill.

A division upon Mr. Onslow's motion was taken. There were 65 votes for and 96 votes against the resolution, which was therefore lost.

BUILDING REGULATIONS IN LEEDS.

THE Corporation of Leeds intend to promote a Corporation Consolidation and Improvement Bill in the coming session of Parliament. The consideration of the building clauses gave rise to the following discussion, as reported in the *Leeds Mercury* :—

Cheap Builders.

Alderman Harrison called attention to clause 10, sub-section B, which states that the Corporation may make by-laws "with respect to the structure and materials of walls, foundations, floors, stairs, roofs and chimneys of new buildings, and the strength of timber and other materials for securing stability and the prevention of fires, and for the purposes of health." He pointed out that the words "and materials" and "for purposes of health" had been added since last year.

Mr. Ambler objected, as an architect, to giving power to the officials of the Corporation to fix the strength of materials. He wished to amend that clause so as to reduce the power.

Alderman Harrison thought Mr. Ambler was under a misapprehension. These by-laws would not be made by any officials. The committee would take the responsibility.

Mr. Ambler moved that the clause be omitted from the Bill.

Mr. Hannam said the clause was not intended to deal with such gentlemen as Mr. Ambler. It was intended to be applied to cheap builders. It was a very necessary clause, and he hoped the Council would pass it. If they did, they would support the Building Clauses Committee to a very great extent.

Mr. Ambler withdrew his amendment.

The Height of Rooms.

Alderman Harrison quoted section 11, sub-section 1, which was as follows :—"Every room used as a dwelling or sleeping-room (except rooms in the attic or roof) shall be 9 feet in height at the least from the floor to the ceiling, and every room used as aforesaid in the attic or roof shall average 6 feet 6 inches in height from the floor to the ceiling, and shall not in any part thereof be less than 4 feet in height from the floor to the ceiling, and no attic shall be built or erected which has not at least underneath it two storeys in height above the surface of the ground, and every dwelling-room in a basement shall be 8 feet in height at the base."

Alderman Sir Edwin Gaunt moved that the height of a dwelling-room in the basement should be 9 feet instead of 8 feet.

The amendment was lost, only nine members supporting it.

Open Spaces about Buildings.

Alderman Harrison next referred to the clauses dealing with the size and position of open spaces about buildings to secure adequate ventilation. Section 11, sub-section A, provided that between the back part of a block of houses and the block on the other side there should be a distance of 36 feet—back-yards of 12 feet to each block of houses and a 12-feet back road. That was practically the present law, and it was proposed by the Building Clauses Committee. The Streets and Sewerage Committee proposed that instead of 36 feet there should be 42 feet.

Mr. Pickersgill moved as an amendment that the back road should be 18 feet.

Mr. Ambler wished to point out what the probable effect would be as to the cost of buildings. There had been a great deal of talk about back-to-back houses, and the desirability of building none but through houses, and they were going to increase the cost of building through houses very considerably by the course they were taking. They were going to compel owners to expend at least 10*l.* per house more in the cost of land and paving the road, and in some cases it would be from 10*l.* to 15*l.*

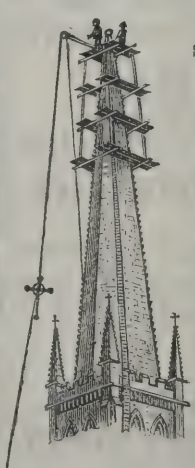
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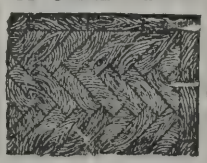
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Alderman Ward hoped that in what they did to-day they would not place a premium upon the construction of back-to-back houses in Leeds. There could be no doubt that a through house was healthier than a back-to-back house. (Mr. Battle: "That is not proved yet.") That was his opinion.

Alderman Sir Edwin Gaunt asked why they should compel people to build back-to-back houses at 4*s.* a week, or jump to through houses which would let at 8*s.*, when they could get houses at 6*s.* He thought that was a great mistake. In Burnley they were building no back-to-back houses, but they built houses which were similar, containing one room and a scullery behind. Let them try if they could not do something practical in this matter.

Alderman Harrison asked, in order to save time, that the Council should determine the sub-section first, the only point of difference being whether they should have a back road 12 feet or 18 feet wide. Then they could go to the question whether they would have back-to-back houses at all.

Mr. Wilson: We ought to settle whether we will have back-to-back houses in the future or not, and then go on to the conditions on which through houses should be built.

The Mayor: The matter before us is not back-to-back houses. If you pass or reject this amendment, we can proceed to the discussion of the more important matter. It is a question of making a back street 12 feet or 18 feet wide. In the process of time these roads will be declared highways, and you must bear in mind you are piling up the agony for the highway rate in years to come.

The amendment was then put and carried by 26 votes to 7.

Back-to-Back Houses.

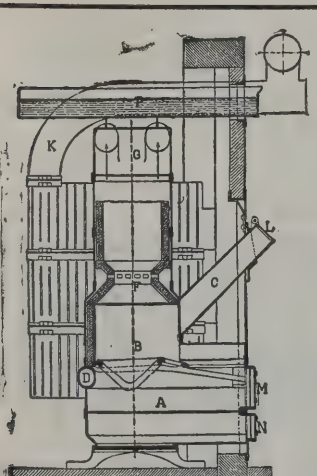
Alderman Harrison then moved the Council's approval of two sections, which, he said, were entirely opposed to each other, but he moved the first one because it was in accordance with his own feelings. It provided that there should be only four back-to-back houses without a break, that was in blocks of eight, with, at the end of each block, a space of 15 feet in width between the buildings, and there should be the necessary conveniences erected. An alternative to this was that instead of having a space at the end of each block of eight, they might have 15 feet width from the forecourt or the front of the building, to the street. He moved that with considerable satisfaction. The alternative section was, "It shall not be lawful to erect any back-to-back dwelling-houses," and it was upon a resolution of the Parliamentary Committee that the matter came before the Council. In the first place they passed a resolution recommending the Building Clauses Committee to consider the subject. They having discussed it, declined to recommend the insertion of a clause in a Bill abolishing back-to-back houses. The Parliamentary Committee then thought that the Council ought to consider the subject, and so they put the clause in the Bill as the only means of bringing it before them. In one respect, indeed, the back-to-back house was better ventilated than through houses, for in nine cases out of ten it was built with an attic, by which a through vertical draught was secured. Then he had inquired as to the cost, and he found that the modern back-to-back house could be let at a rent of 3*s.* 9*d.* to 4*s.* 6*d.* per week, and that he believed was overstating the case; while a through house could not be built and let at less than from 5*s.* to 6*s.* 6*d.* per week. No working man with a family would be able to occupy exclusively a through house at that rent; and if they decided to have no modern back-to-back houses in the future, it almost of necessity followed that two families would take the through houses. That was done in other towns, and the landlord increased the rent because of the second family; and if such were to be the alternative, by all means let them have the modern back-to-back house.

Alderman Ward stated, on the authority of more than one architect in Leeds, that it was possible to give a thoroughly good through house, containing, in every respect, accommodation equal to a back-to-back house, for a rent of 4*s.* 6*d.* a week. He thought the time had come when they should, as far as possible, encourage the building of through houses; and, with the view of testing the question, he would move that the clause be adopted, and that for the future they forbid in the borough of Leeds the erection of back-to-back houses.

Mr. Leuty moved the following amendment:—"That the Council ask for power to refuse to pass any plan for the erection of back-to-back houses; but if such plans be passed there shall be provision made in the Bill for securing the provision of attics, and a 42-feet street on each side, but through houses may be built in blocks of six, with a 36-feet street both back and front." He was not prepared to go in for a drastic resolution against the erection of back-to-back houses whatever might be the circumstances. If the Council proceeded on the plan he suggested they would have the power in their own hands.

After a discussion, a vote was taken on Alderman Ward's amendment, that "it shall not be lawful to erect any back-to-back dwelling-houses." Only four members supported the amendment, which was lost.

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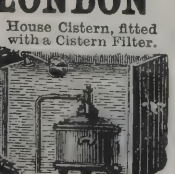


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Mr. Leuty's amendment was next voted upon, and met with six supporters. It was, therefore, rejected.

The resolution was then adopted, with a rider moved by Alderman Harrison to the effect that, in addition to the other provisions with regard to through houses, such houses may be erected fronting a 14-yards street on the same principle as back-to-back houses, as set forth in Sub-section E of Section 11.

The Drainage of Buildings.

Section 17 is as follows:—"No house or building shall be erected or rebuilt unless the level of the lowest floor shall be of a sufficient height to allow of the construction of a drain from such house or building to empty into some sewer belonging to the Corporation, and for that purpose the levels shall be taken and determined under the direction of the borough engineer."

Mr. Hannam said he was quite willing that this section should be adopted in its entirety, but the Corporation itself was very inconsistent in carrying it out. The Building Clauses Committee said this clause must be carried out, but the Sanitary Committee in a year or two would say they did not approve of this, and that they wanted the gullies and everything else brought up to the surface. It was very hard upon property owners.

Alderman Harrison, in reference to a point raised by Alderman Firth, agreed to insert the words, "where such drain exists."

Mr. Winn suggested that the Building Clauses Committee and the Sanitary Committee and the borough engineer might consult together upon this matter with very great advantage.

Mr. Hannam said a sub-committee had been appointed from the two committees to consider the question, and try to bring about harmonious action.

The clause was adopted.

Section 18, which provided that houses should not be built below the level of the ground without areas, and section 25, which referred to the erection of temporary buildings, were struck out.

Provisions as to Hoardings.

On section 26, which contains provisions as to hoardings:—

Alderman Emsley moved "That no hoarding belonging to the Corporation shall be let or used as a bill-posting station."

Alderman Bower did not see why the Corporation should not have power to let these stations if they liked.

The amendment was lost.

Alderman Firth moved to reinsert sub-section 3, which had been struck out. It was as follows:—"No advertising board, placard, notice or any advertisement whatever shall be allowed to be affixed to or posted on such board or fence without the consent of the Corporation."

The amendment was negatived.

Sections 27 to 44, completing the proposed building regulations, were adopted.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

20302. Edward William Sant, for "Improvements in safety apparatus for hoists or lifts."

20361. John Henry Newsam, for "Improvements in connection with the key-holes of doors and the like."

20397. James Ashford, William Tylar and David Grayl, for "A new or improved combination mathematical drawing instrument."

20463. Herbert Hague, for "Improvements in open and close cooking ranges."

20526. John Hosking Pett and Richard Matthews, for "Improvements in chimney cowls and ventilators."

20535. Henry Harrington Leigh, for "Improvements in mechanism for closing doors and swinging shutters."

20549. Samuel Kirk and William McDougall, for "An improved lock and hanging window-frame and sash."

20643. Robert Rankin, for "Marking the styles and rails of doors and sashes and other joiners' work, for morticing while on slide of tenoning machine or otherwise."

20701. Thomas Eyre, for "Improved bracket and stand-plate or rack for attachment to the bars of fireplaces."

20711. George Williams and Frederick Harman Peter Berlyn, for "Improvements in advertising, also applicable to decorative purposes."

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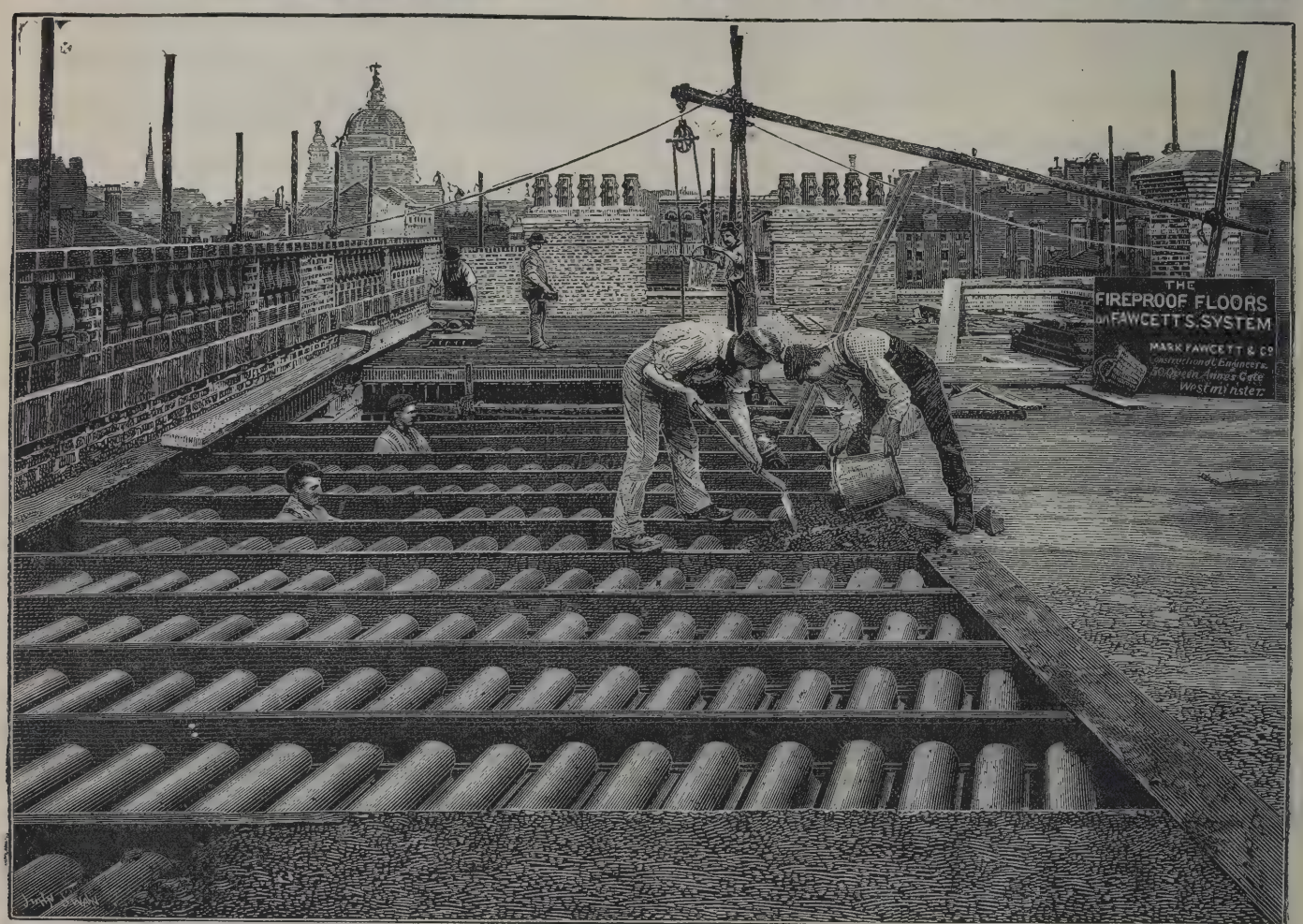
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Friday, December 11, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, DECEMBER 18, 1891.

NOTICE.

Next Friday being Christmas Day, THE ARCHITECT *will be published on Thursday. All Advertisements intended for this Number must reach the Office not later than 3 p.m. on Wednesday, December 23.*

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

CONTRACTS OPEN.

ABERAFON.—Jan. 9.—For Alterations and Improvements to Police Station. Mr. T. Mansel Franklen, Clerk of the County Council, Cardiff.

BANFF.—Dec. 25.—For Works in Building Bank Office and Agent's House. Messrs. Wm. Henderson & Son, Architects, 124 Union Street, Aberdeen.

BANGOR.—Dec. 23.—For Building Infectious Diseases Hospital at Minfforddd. Mr. John Gill, Borough Surveyor, Bangor.

BATLEY.—Dec. 18.—For Building Four Dwelling-houses. Messrs. P. Spencer & Son, Architects, Batley Carr.

BATH.—Jan. 1.—For Alterations to Wesleyan Chapel and Lecture-hall, Walcot. Mr. Alfred Long, Architect, High Street, West Bromwich.

BATLEY.—Dec. 21.—For Building Two Dwelling-houses, Outbuildings and Boundary-walls. Mr. John H. Brearley, Architect, Commercial Street, Batley.

BEAUMARIS.—Dec. 21.—For Building Premises. Mr. R. G. Thomas, Architect, Menai Bridge.

BODIAM.—Dec. 31.—For Rebuilding Bodiam and Hammerditch Bridges. Mr. Henry Card, County Surveyor, Lewes.

BOURNEMOUTH.—Dec. 24.—For Lighting by Electricity the Pier, Pleasure Gardens and Municipal Buildings. Mr. F. W. Lacey, Borough Engineer, Town Hall Chambers, Bournemouth.

BRADFORD.—Dec. 19.—For Building Four Back-to-Back Houses, Dudley Hill. Mr. J. H. Holmes, Architect, Dudley Hill, Bradford.

BRADFORD.—Dec. 22.—For Building Warehouse. Mr. R. Calvert, Architect, 4 Forster Square, Bradford.

BRADFORD MOOR.—Dec. 19.—For Building Two Houses. Mr. B. Dobson, Architect, 75 Leeds Road, Bradford.

CARDIFF.—Dec. 23.—For Building Two Semi-detached Cottages, Ely. Mr. S. Rooney, Architect, Caledonian Chambers, Cardiff.

CARMARTHEN.—Dec. 28.—For Building Infant School and Alterations to Pentrepoth School.

CASTLETOWNSEND.—Dec. 24.—For Building Dwelling house. Mr. A. Hill, B.E., Architect, 22 George Street, Cork.

CLAYTON.—Dec. 23.—For Building Methodist Sunday School and Classrooms. Mr. John Drake, Architect, Winterbank, Queensbury.

CROYDON.—Dec. 21.—For the Foundations and Substructure of New Municipal Buildings and Free Library to be Erected in Katharine Street, Croydon. Mr. C. Henman, Architect, 64 Cannon Street, E.C.

DUBLIN.—Jan. 1.—For Alterations to Mansion, Athgoe Park, Hazelhatch. Mr. Wm. H. Byrne, Architect, 20 Suffolk Street, Dublin.

EGREMONT.—Dec. 21.—For Building Church, Schools, Caretaker's House, Boundary Walls, &c. Mr. J. S. Moffatt, Architect, 53 Church Street, Whitehaven.

ENDERBY.—For Enlargement of National School and Infant School. Mr. W. H. Simpson, 26 Friar Lane, Leicester.

GUERNSEY.—Dec. 19.—For Building Secondary Schools. Mr. Frank Whitmore, Architect, Chelmsford.

HALIFAX.—Dec. 30.—For Building Store and Six Houses. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HALIFAX.—Jan. 2.—For Building Shop Premises. Messrs. G. Buckley & Son, Architects, Tower Chambers, Halifax.

HAMSTERLEY.—Dec. 31.—For Building Mission Chapel. Messrs. Hicks & Charlewood, Architects, 42 Grainger Street, Newcastle-on-Tyne.

HANWELL.—Dec. 23.—For Building Fire-engine House, Store-room and Cart-shed. Mr. Warren S. James, Clerk to the Local Board, High Street, Hanwell, W.

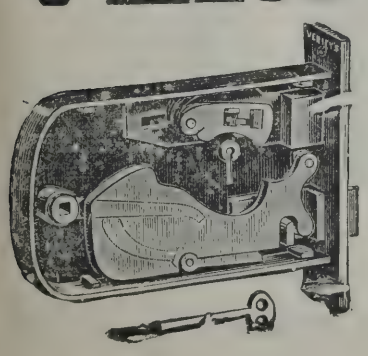
IPSWICH.—Jan. 5.—For Building Additional Classrooms for Technical Instruction to Science and Art Schools. Mr. H. Miller, jun., C.E., Exchange Chambers, Ipswich.

KENSINGTON.—Jan. 14.—For Building Administrative Block and Three Pavilions for Patients at Infirmary, Marloes

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KINGSBRIDGE.—Dec. 19.—For Building Residence, Stables and Boundary Walls. Mr. William Grainger, Architect, Waterloo Place, Kingsbridge.

LAMBETH.—Dec. 23.—For Additions, &c., Montford House Dispensary. Mr. W. B. Wilmot, Clerk to the Guardians, Brook Street, Kennington Road, S.E.

LEWISHAM.—Jan. 14.—For Building Infirmary. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

LIVERPOOL.—Jan. 6.—For Building Workhouse Infirmary, &c. Messrs. C. O. Ellison & Son, Architects, 22 St. Thomas's Buildings, Liverpool.

LLANDEBIE.—Jan. 12.—For Additions and Alterations at Board Schools, Cross Inn, Ammanford and Drefach. Mr. David Jenkins, Architect, Llandilo.

LONDON.—Dec. 19.—For Supply of Paving Materials, Drain Pipes, Paint, Ironmongery, Castings, Timber, &c., for one year. Mr. G. Livingstone, Surveyor, 1 Pimlico Road. S.W.

MANCHESTER.—Dec. 23.—For Building Fire Station, Upton Street. The City Surveyor, Town Hall, Manchester.

MANCHESTER.—Dec. 23.—For Building Shed and Stable on Two Sites. The City Surveyor, Town Hall, Manchester.

MARYPORT.—Dec. 24.—For Altering Baptist Schoolroom into Conservative Club. Mr. P. de E. Collin, Solicitor, Maryport.

MEDOMSLEY.—Dec. 19.—For Building Business and Manager's House. Mr. J. W. Rounthwaite, Architect, Blackhill, co. Durham.

OSSETT.—Dec. 24.—For Building Five Shops, &c. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

PENZANCE.—Dec. 28.—For Building Mission Church and Vestries at Hea Moor. Mr. H. White, Architect, 1 Parade Passage, Penzance.

PLASHET.—Dec. 18.—For Alterations to Schools. Messrs. Wilson, Son & Aldwinckle, Architects, 1 Victoria Street, Westminster, S.W.

PONTARDAWE.—Dec. 31.—For Widening Bridge. Mr. T. Mansel Franklen, Clerk to the County Council, Cardiff.

READING.—Dec. 29.—For Building Workshops, Stores, Boundary Walls, &c., and Construction of Iron Roof, 84 Feet by 60 Feet. Mr. Arthur E. Collins, Borough Engineer, Town Hall, Reading.

ROCHDALE.—Dec. 19.—For Building Higher Grade Board School. Mr. G. H. Wheeler, Clerk, School Board Offices, Baillie Street, Rochdale.

ROCHESTER.—Dec. 21.—For Additions to Municipal Buildings. Messrs. Goldsmith & Gosling, Architects, 10 Gray's Inn Square, W.C.

ROTHERHAM.—Dec. 23.—For Construction of Strong Room, at Messrs. Oxley & Coward's Offices. Mr. E. Isle Hubbard, Architect, Moorgate Street, Rotherham.

RUABON.—Jan. 1.—For Building Policeman's House, Upper Ponkey. Major T. J. Leadbetter, County Buildings, Wrexham.

RUSHTON.—Dec. 18.—For Building School and Schoolhouse. Messrs. Gotch & Saunders, Architects, 1 George Street, Kettering.

SHEFFIELD.—Dec. 22.—For Additions to Infant School, Burncross. Mr. G. A. Wilson, Architect, Hartshead Chambers, Sheffield.

SOUTHALL.—For Dining-hall to Marine Restaurant. Mr. W. H. Peters, jun., Southend.

STAINCLIFFE.—Jan. 1.—For Heating Infirmary and Workhouse. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

TONYPANDY.—Dec. 29.—For Alterations and Additions to Co-operative Society's Premises. Mr. R. S. Griffiths, Architect, Excelsior Buildings, Tonypandy.

WALSALL.—Dec. 22.—For Building Board Schools, The Pleck. Mr. H. McConnal, Architect, 2 The Bridge, Walsall.

WELCOMBE.—Dec. 21.—For Building Hermitage. Mr. Joseph Yeardye, Architect, 6 Fortescue Place, Ilfracombe.

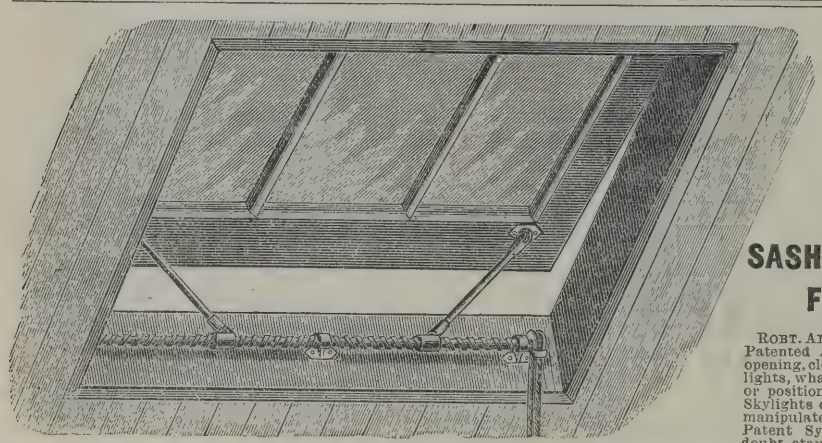
WOKING.—Dec. 22.—For Building Shop and Premises. Mr. R. Clamp, Architect, Woking.

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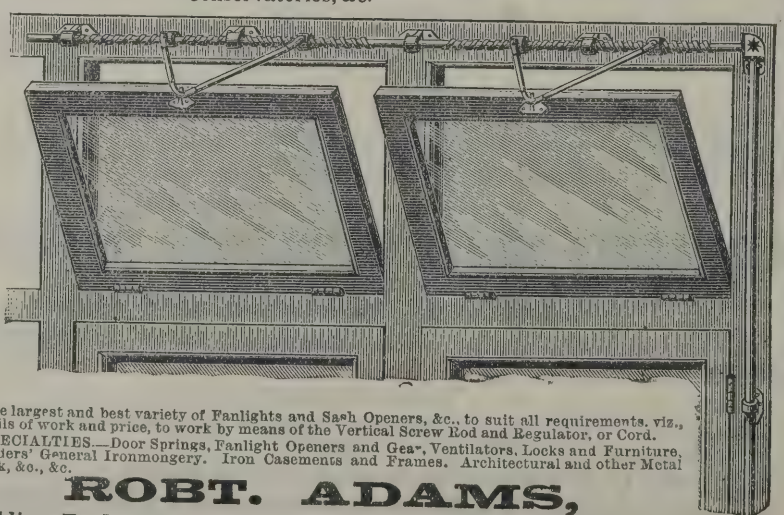


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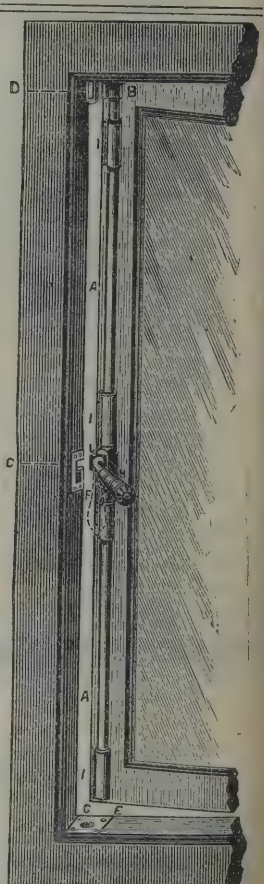




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D. J. Davies, Cardiff	730 0 0
Jones Bros., Cardiff	700 0 0
G. H. Hodgkinson, Cardiff	671 11 0
J. Hopkins, Cardiff	660 0 0
E. TURNER & SONS, Cardiff (*accepted*)	633 0 0

For Alterations at the Antelope Hotel, Bute Street, Cardiff, for Mr. W. Richards. Mr. J. P. JONES, Architect, Park Street, Cardiff. Quantities by Architect.

T. Richardson, Cardiff	£474 4 1
D. Davies, Cardiff	440 0 0
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Jones Bros., Cardiff	369 0 0
J. Hopkins, Cardiff	365 0 0
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R. Wootton, Coventry	567 0 0
Kelley & Son, Foleshill	505 0 0
C. Garlick, Coventry	495 0 0
Thos. Wright, Foleshill	470 0 0
J. H. WESTON, High Street, Leicester (*accepted*)	441 0 0

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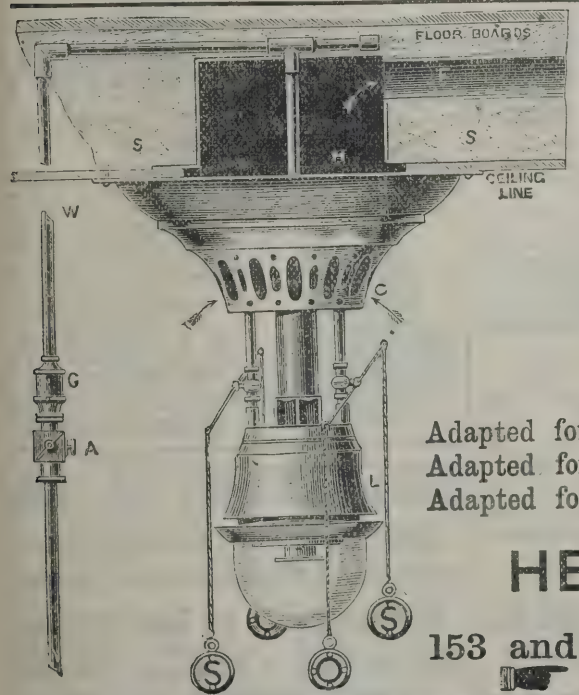
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THOS. WRIGHT, Foleshill (*accepted*)	296 0 0

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R. Wootton	328 0 0
Kelley & Son	319 0 0
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THOS. WRIGHT, Foleshill (*accepted*)	280 0 0

For Erection of Houses at Little Heath, for the Co-operative Society, Limited. Mr. AMOS RANDLE, Architect, 21 Broadgate, Coventry.

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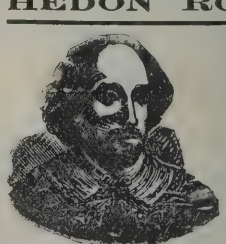
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W. Shepherd	7,950	0	0
J. T. Chappell	7,948	0	0
McCormick & Sons	7,888	0	0
Foster & Dicksee	7,888	0	0
Jackson Bros.	7,878	0	0
W. Akers & Co.	7,697	0	0
Rowe Bros.	7,682	0	0
B. E. NIGHTINGALE (*accepted*)	7,673	0	0
W. Oldrey & Co.	7,447	0	0

For Weights and Measures Office in Rosebery Avenue, for the London County Council.

Brass & Son	£7,977	0	0
Lathey Bros.	7,936	0	0
B. E. Nightingale	7,890	0	0
G. Munday & Sons	7,420	0	0
E. Triggs	7,400	0	0
A. Kellett	7,290	0	0
Pearce & Co.	7,280	0	0
J. Allen & Sons	7,100	0	0
Scharien & Co.	6,893	0	0
Co-operative Builders	6,838	0	0
A. Braid & Co.	6,200	0	0

LONDON—*continued.*

For Electric Lighting at Central Offices of the London County Council.

Suter & Co.	£2,996	0	0
Laurence, Scott & Co.	2,815	0	0
Siemens Bros. & Co.	2,715	0	0
Lund Bros. & Co.	2,600	0	0
Spagnoletti & Co.	2,590	0	0
Girdlestone & Co.	2,300	0	0
Sharp & Kent	2,300	0	0
Johnson & Phillips	2,288	0	0
Ewart & Son	2,230	0	0
W. Goolden & Co.	2,229	0	0
Latimer Clark, Muirhead & Co.	2,192	7	0
Crompton & Co.	2,140	0	0
Brush Electrical Engineering Co.	2,136	0	0
Planet Electrical Engineering Co.	2,056	8	2
Mather & Platt	2,000	0	0
Electrical Supplies and Fittings Co.	1,996	0	0
Reid Bros.	1,964	0	0
Paterson & Cooper	1,842	0	0
General Electric Power Co.	1,830	0	0
London and Lancashire Electric Co.	1,825	0	0
Edmundson's, Limited	1,815	0	0
Woodhouse & Rawson	1,810	0	0
F. G. Howard	1,745	0	0
Drake & Gorham	1,731	0	0
Croggon Co., Limited	1,655	0	0
H. South	1,604	0	0
J. R. Powditch & Co.	1,598	0	0
H. F. Joel	1,586	0	0
J. Jackson	1,570	0	0
Fowler, Lancaster & Co.	1,564	0	0
Barclay & Sons	1,500	0	0
J. D. F. Andrews & Co.	1,490	0	0

MATLOCK BRIDGE.

For Building Bath-houses at Smedley's Hydropathic Establishment, Matlock Bridge. Mr. GEORGE E. STATHAM, Architect, Nottingham and Matlock. Quantities by Architect.

L. T. WILDGOOSE, Matlock, mason, slater and plasterer (*accepted*)	£7,400	0	0
MOORE BROS., Rawtenstall, carpenter, iron-founder, plumber, &c. (*accepted*)	3,450	0	0

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112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1 inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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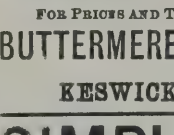
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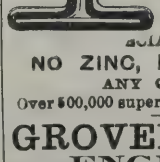
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FROM THE "LINDLEY" QUARRIES, MANSFIELD.

LUTON.

For Proposed Alterations, for Messrs. Arnold & Co. Mr. A. E. SMITH, Architect.

G. Kingham	£813	10	0
J. Neville	775	0	0
J. Long	774	0	0
G. Pryce	724	0	0
G. Smart	720	0	0
J. Saunders	707	14	0
D. Parkins	627	0	0

MONTROSE.

For Additions and Alterations, Craig Public School. Mr. SIM, Architect, Montrose.

Accepted Tenders.

Reid & Burnett, Montrose, mason	£152	0	0
W. Henry & Sons, Montrose, joiner	117	19	0
C. Brand, Montrose, slater	22	15	0
A. Moug, Montrose, plumber	17	10	0
A. Shand, Montrose, plasterer	12	0	0

NEWRY.

For Building Town Hall and Municipal Offices, Newry, Co. Down. Mr. WILLIAM BATT, M.R.I.A., Architect, Garfield Chambers, Belfast. Quantities by Mr. S. C. Hunter, Belfast.

Bright Bros., Portadown	£7,906	0	0
R. Corry, Belfast	7,755	0	0
A. Whelan, Newry	7,330	0	0
D. Mahood, Newry	7,177	0	0
J. Lowry & Son, Belfast	7,050	0	0
Dixon & Campell, Belfast	6,850	0	0
COLLEN BROS., Portadown (*accepted*)	6,632	0	0

OUNDLE.

For Construction of Waterworks and Sewage Disposal Works. Mr. W. H. RADFORD, Engineer, Nottingham.

Waterworks.

Freeman & Son, Thrapston	£3,463	18	2

Sewage Disposal.

Freeman & Son, Thrapston	2,986	1	11

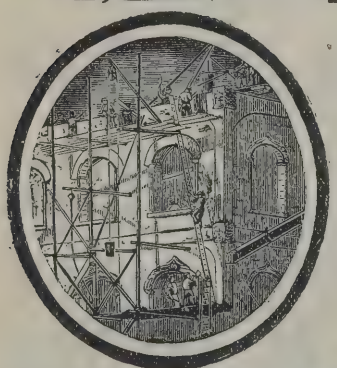
Iron Pipes.

Cochrane & Co., Woodside Ironworks	1,896	4	8

THE SANITARY INSTITUTE.

AT the last sessional meeting of the Sanitary Institute, a paper on the sewerage of Maldon, Essex, with some observations on recent practice in sewer ventilation, was read by Mr. Richard F. Grantham, C.E. The lecturer described the construction of the sewers at Maldon and the means adopted to take the sewage away from the town. In dealing with the ventilation question, Mr. Grantham said the primary conditions now fully recognised, which could not be too strongly insisted upon, for preventing the accumulation of foul air, were sufficient falls in the sewers, construction of the best kind, proportions to suit the expected volume of sewage so as to give a self-cleansing velocity, flushing where necessary, and as many openings into the outer air as practicable. Destructors, involving the burning of gas, had been and were now being used, but so far the results had not been better than those obtained from the simple shaft. Recent investigations and experiments had shown that tall shafts carried well above house-tops caused an improvement in the air of sewers. Connection with tall furnace chimneys had been tried, and a powerful current thereby induced, but its effect had been found to be destroyed when there were many inlets in the sewer, a current of air being drawn with great force through them. The position of the pipe shafts must be most carefully chosen and carried up to a proper height, but any risk of nuisance was obviated by there being a good number of them. In the examples and experiments mentioned by the lecturer there was, he said, a unanimity of opinion and practice in regarding upcast shafts as necessary adjuncts to sewers, but he did not go so far as to advocate the abolition of open gratings at the street level over manholes and lampholes, inasmuch as with a sufficient number of shafts the gratings would act as air inlets. Any material or contrivance introduced into the manholes or shafts through which sewer air passed had served only to retard the passage of the air without a sufficiently compensating advantage. The practice of establishing upcast shafts was increasing, and probably in the course of time would be generally adopted. The lecturer added that he believed with improved conditions in course of time the two systems of ventilation, one for the main sewer and the other for the house, might be amalgamated, and syphon traps in the house drain outside the house might be omitted. A discussion followed, and a vote of thanks to the lecturer for the paper was passed.

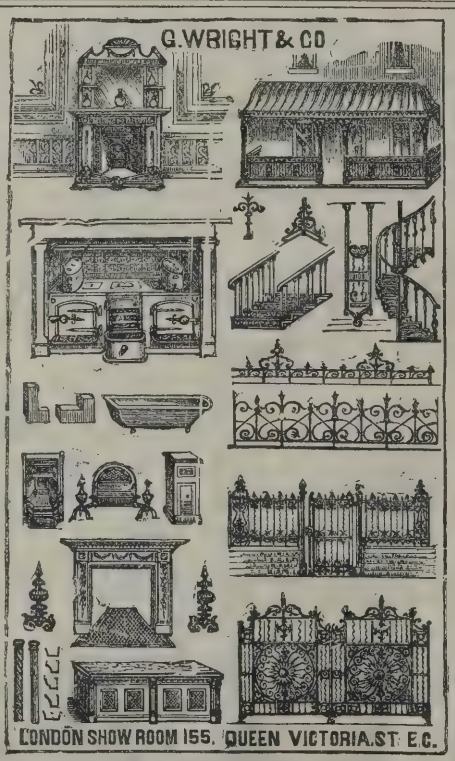
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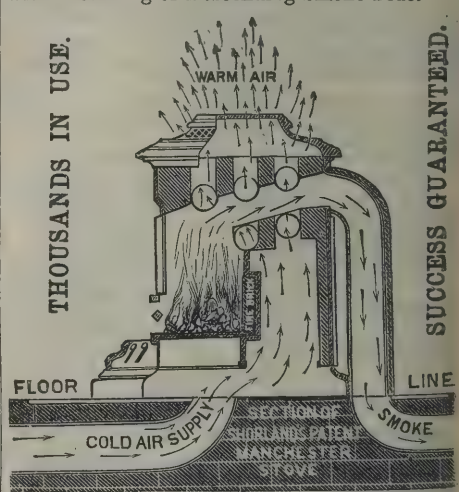
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Made in various Designs and Sizes, with Tiled or Iron Sides, Single or Double Fronted, and with Ascending or Descending Smoke Flue.



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Shorland's Inlet and Outlet Ventilators in every Design.

MAKING-UP STREETS.

AT the Tunstall Stipendiary Court, Mr. John Grosvenor, builder and contractor, and a member of the Board of Health, was summoned at the instance of the Tunstall Board for the recovery of 56*l.* 8*s.* 11*d.* for private improvements. It was stated that the defendant built a number of houses in Henry Street, and on May 3, 1889, the medical officer reported that the condition of the street was unsatisfactory. On the recommendation of the Sanitary and Highways Committees the property-owners, including the defendant, were called upon to put the street in order. This they failed to do, and the Board accordingly accepted a contract for the carrying out of the work, and apportioned the cost amongst the owners, the defendant's share amounting to the sum claimed. Mr. Grosvenor claimed that he was not liable on account of work previously done to the street; but the Board contended that the street never was put into a condition that would justify them in taking it over.

Mr. A. R. Wood, surveyor to the Board, stated when the owners were called upon to do the work the street was in a bad state, only partially sewered, and not in a condition to give satisfaction to the Board. What had been previously done to it was only sufficient to satisfy the Building Committee in allowing the defendant to proceed with the erection of his houses.

Mr. J. Lobley, borough surveyor of Hanley, and Mr. R. Dain, surveyor, gave evidence that it was the practice that before houses were erected in a street, such street was required to be made for the purpose of the buildings, and then, when it was thought that the street would be useful to the public, Section 150 of the Public Health Act was put in force, requiring the owners to make the street in such a way that it could be taken over by the Local Authority. A street as formed for building purposes was not in the condition required by Section 150, and frequently the work done previous to building became so worn that it had to be done over again.

For the defence, it was submitted that, though this might have been the practice, the law did not require work of this class, which was once done to the satisfaction of the authority, to be done a second time.

Mr. Grosvenor stated that when the street was made in 1874 it was properly made in accordance with the by-laws, and in 1889 his portion of the street was as good as it was after the work had been done by the Board.

The Stipendiary held that the defendant was liable, and ordered the amount claimed, with costs, to be paid within a month.

BUILDING AND BUILDERS.

THE Chairman of the Great Eastern Railway has announced that 30,000*l.* is to be expended on cottages for signalmen, porters and other employés.

NEW classrooms in connection with Bunyan Meeting Sunday Schools, Bedford, were opened by the mayor of Bedford (Dr. Combs, J.P.), on Thursday, December 10. The works have been carried out from the designs and under the superintendence of Messrs. Usher & Anthony, of Bedford, the architects, by the contractor, Mr. J. P. White, at the cost of about 1,300*l.*

AT the meeting of the Leith Dean of Guild Court warrants were granted to Mrs. Thompson, to erect a warehouse at the corner of a new street to be formed between Elbe Street and Assembly Street; and to Messrs. T. & A. Nicoll, to erect a tenement of dwelling-houses in a new street to be formed running off the Lindsay Road.

AT the meeting of the Hospitals Sub-Committee of the Sanitary Committee of the Leeds County Council, it was resolved to take steps to secure a site, about twenty acres in extent, upon which to erect an hospital for infectious diseases.

A RESOLUTION in favour of building a public hall for Walsall was agreed to at the meeting of the Town Council.

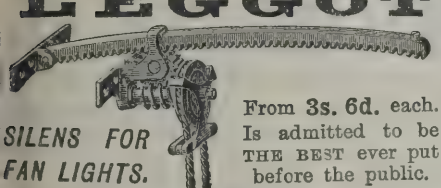
PLANS for a new public hall and municipal offices for Conway, prepared by Mr. T. B. Farrington, have been adopted and referred to a committee to obtain estimates.

A MOVEMENT has been started to raise 2,500*l.* to rebuild the tower of Great Chesterford Church upon the site of a tower which existed some centuries ago, the foundations of which have been recently discovered.

PLANS, prepared by Mr. E. E. Scrivener, architect, for the enlargement of the Fenton, Bagnall and Harpfield schools have been approved by the Stoke-on-Trent School Board.

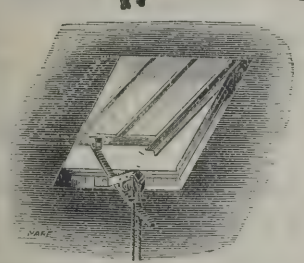
THE annual general meeting of the members of the Cardiff Master Builders' Association was held at the Angel Hotel, Cardiff. There was a large attendance, the chair being occupied by Alderman David Jones. The report and balance-sheet for the year were presented and passed. They showed a very satisfactory state of affairs, and gratification was expressed at the strength of the Association, which now numbers close upon fifty, including the principal builders and contractors of the town. Alderman David Jones was re-elected president, Mr.

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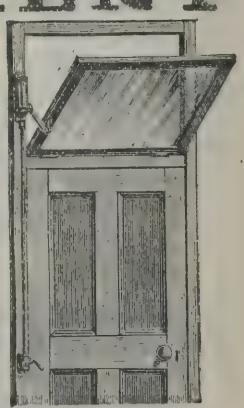
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The WILMOS is worked with a rod or endless cord. It is extremely neat, and can be fixed to open either top or bottom, inwards or outwards, no cutting away of frame required. When worked with a rod is most efficient for Public Buildings, as the key can be loose. For Price Lists, Illustrations and Testimonials, write as below. For Continuous and other Lights, Estimates given.



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THE "ECLIPSE" PAINT REMOVER & CLEANSER.
The Best, Cheapest, and Most Effective in the World.
1A CRESCENT, MINORIES, LONDON, E.C.

F. S. Lock, vice-president, and Mr. S. Shepton hon. treasurer. The retiring committee was also reappointed.

AN inquiry has been held in regard of the application of the Elland Local Board to the Local Government Board for permission to borrow 2,000*l.* for the erection of a fire-brigade station, &c., and 500*l.* for works of sewage. Messrs. Horsfall & Williams, of Halifax, are the architects of the proposed buildings.

AT the meeting of the Lichfield Board of Guardians a letter was read from the Local Government Board enclosing orders for the erection of a new dining-hall, &c., at a cost of 3,500*l.*

IT is stated that the railway-station and telegraph offices at Valparaiso have been destroyed by fire, the damage being estimated at 500,000 dollars, and that a terrible storm of wind has passed over the city, wrecking many buildings.

THE Halifax Corporation have received from the Local Government Board sanction to borrow 6,820*l.* for the erection of baths at Haley Hill, and the Waterworks Committee have resolved to proceed with the work according to Messrs. Horsfall & Williams's plans.

AT the meeting of the Kirkcaldy School Board, Mr. M. B. Nairn, chairman, offered to extend and fuily equip the Burgh School with gymnasium and workshops, to make it a secondary and technical school. The cost of providing the proposed school is estimated at from 6,000*l.* to 7,000*l.*, and the Board is allowed till March to accept the offer.

MR. COYNE, superintendent, in his monthly report to the Edinburgh and District Water Trust, states that the number of pipes laid during November was 109, of which 58 were extensions of the system. The number of apparatus examined for checking waste was 30,469, of which 962 were found faulty or in a state of disrepair.

AN extensive range of offices is now in progress at the St. Vincent's Ironworks, Bristol, for Messrs. John Lysaght, Limited. The frontage will be over 100 feet, with a depth of 60 feet. The two main façades will be of Doulting stone, and when completed will be a conspicuous improvement to the district. The plans have been prepared by Mr. R. Milverton Drake, architect, of 24 College Green, Bristol, under whose supervision the work is being carried out.

IN a report to the Shrewsbury Town Council the Public Baths Committee recommended an alteration in the accepted plans for the new public baths which would effect a saving of 500*l.* in the cost of erection, and to diminish the cost of subsequent management. The first-class swimming-bath would be reduced in area to 2,250 feet, and the second-class enlarged to 2,700 feet, both being 10 yards wide. Private baths for both sexes would also be provided. The cost was estimated at 6,500*l.* with the alterations proposed, and 4,000*l.* would have to be borrowed. The report was adopted.

TRADE NOTES.

THE London County Council has just ordered a new Merryweather steam fire-engine, which will be stationed at Woolwich, the furthest station from headquarters in the South-Eastern district. The machine will be similar to sixteen already in use by the Metropolitan Brigade, and made by the same firm.

THE new Board Schools, Grimsby, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates and vertical inlet brackets, the same being supplied by Mr. E. H. Shorland, of Manchester.

SOME very expeditious work has been recently carried out at the French Gallery, Pall Mall, by Messrs. Frank Suter & Co., 66 Berners Street, W. This firm commenced work on Friday evening, the 11th inst., at five o'clock, and had entirely completed the installation of their system of picture-lighting by ten o'clock the following morning. We understand that the system adopted is similar to that employed by the same firm in the galleries of Messrs. Tooth, Messrs. Maclean and Messrs. Dowdeswell.

MESSRS. ARCHIBALD SMITH & STEVENS are supplying to the University College at Nottingham, for the use of the students, a set of hydraulic machinery, comprising one of their "Reliance" lifts, a set of high-pressure pumps and an accumulator. The latter will also supply water for an hydraulic testing machine. The same firm have had the passenger lifts at the Grand Hotel, Eastbourne, placed in their hands for overhaul, and in one case partial reconstruction. A new pumping engine and hydraulic accumulator form part of the new scheme. A similar set of hydraulic power machinery, together with two "Reliance" passenger-lifts, are also in hand for the York Street Property Company, Manchester, the lifts being of same construction as that just erected by the same makers at Lloyd's House, Manchester. "Reliance" passenger-lifts are also in progress for five separate buildings on the sea-front at Brighton.

Awards—Gold Medal, Saltaire, 1887; Silver Medal, Brussels, 1888; Silver Medal, Paris, 1889; Gold Medal, Brighton, 1889

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BRITANNIA TIN AND COPPER WORKS.
TO ARCHITECTS AND BUILDERS.

Fountain Street, Bury, and Shiffnall Street, Bolton:
February 13, 1891.

Gentlemen,—We have pleasure in announcing that we have opened extensive Show Rooms at 117 QUEEN VICTORIA STREET, LONDON (opposite Civil Service Stores).

We have been very successful in Lighting and Ventilating Public Buildings in all parts of the Country.

We have a large stock of Sunlights, Turrets, Exhaust Roof Outlets, Tobin's Tubes, Air Grids, &c., &c., at our Show Rooms.

We feel confident that our **DESIGNS**, as well as our system of Lighting and Ventilating will commend themselves to all who are interested in having BRILLIANTLY LIGHTED and WELL-VENTILATED ROOMS.

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for Warneford Hospital, Leamington; and in London for Talbot House, Arundel Street; Geo. Newnes & Co., Limited; New Travellers' Club; St. George's Club; St. Ermin's Mansions; Ashley Gardens (sixth machine ordered); Continental Gas Association; Royal South London Ophthalmic Hospital; Hereford Mansions; Compton House; and six for the Imperial Institute, with other lifts, pumping engine and accumulator. A large hydraulic balance lift is in course of erection, under Stevens & Major's patent, at the offices of the North British and Mercantile Assurance Association.

THE ventilation of the Lochwinnoch Schools has been entrusted to Messrs. Baird, Thompson & Co., ventilating engineers, London and Glasgow.

AT the meeting of the Kirkintilloch Police Commissioners, a communication was read from Mr. Copland, C.E., Glasgow, relative to the South Lenzie drainage. The proposed ventilating shafts would, he stated, carry the air from the sewers over the heads of the people, but under certain atmospheric conditions the sewer-gas escaping from the ventilating shafts would descend. He did not wish to be understood as saying that ventilating shafts would make no improvement, but merely that they must not be relied on to cure the smells.

SCHEDULES for work in connection with the erection of a new railway station at Grahamston, Falkirk, have been issued to several of the local tradesmen asking them to send in estimates. The building will include ticket-offices, waiting-rooms, agent's house, &c. A covered-in platform will be formed on the south side of the railway extending to about 180 feet, while on the north side a platform, also covered in, will extend to about 100 feet.

THE Leeds Waterworks Committee have resolved to increase the reservoir at Moortown to double its present size, and the contract of Messrs. Gould & Stevenson, Hunslet, to do the work has been accepted. The improvement will involve an expenditure of over 4,000*l.*

AT the meeting of the Conway Town Council Mr. T. B. Farrington, the borough surveyor, submitted a report with reference to proposed improvements and additions to the gas-works at an estimated cost of 2,000*l.*

A VERY useful little diary and almanack for 1892 has just been issued by Messrs. Chubb & Son, of 128 Queen Victoria Street, E.C. It contains the usual almanac, information, and a diary, three days to the page. It is well bound in morocco and gilt-edged.

VARIETIES.

MR. W. P. BUCHAN, the well-known master plumber of Glasgow, has just been admitted to the Freedom and Livery of the Worshipful Company of Plumbers.

THE Blackpool Tower Company have completed the purchase of the Aquarium site, and possession of the land and buildings was formally handed over to them. Owing to a firm having failed to fulfil their agreement, the Tower Company have saved the sum of over 21,000*l.*, and the price paid for the site is 72,800*l.*, instead of 94,000*l.*, as stated in the prospectus. The contract for the foundation works had been let to Messrs. Robert Neill & Sons, contractors, Manchester.

WE have much pleasure in stating that the net proceeds of the entertainment given at the Prince's Hall by Mr. and Mrs. F. T. Davies, for the benefit of the poor of St. Pancras, realised the substantial amount of 305*l.* 2*s.* 6*d.*

A BILL which will come before Parliament in the next session seeks for power to execute further experimental works in connection with the Channel Tunnel, vesting in the Lords of the Treasury the sole right of determining the expediency of continuing such works, subject to such conditions, restrictions and requirements as they may prescribe. It is also provided that in the event of such experimental works proving successful, the Channel Tunnel Company may be required within ten years to sell them to the Lords of the Treasury. The Bill also provides for the South-Eastern and London, Chatham and Dover Railway Companies participating in the execution of the work, whether experimental or permanent.

DURING the progress of the work of restoring Crowland Abbey, Lincolnshire, an interesting discovery has been made. The workmen were about to remove a decayed stone, to replace it with a sound one, when they discovered that the walls between the buttresses consisted of only thin casings of stone built over an older wall, which was completely covered with panelling similar to that on the interior of the west wall of the tower. A good portion of it has been laid bare, and will be undoubtedly preserved. The tower of this historic building has now been made safe from its very foundations, which have been under-built; while the spiral stairs, the bearing arches which carry the steeple, and the porch, with the King's chamber, are all secure. The preservation of the bell-chamber is about to be undertaken, with the necessary work for putting the fittings of

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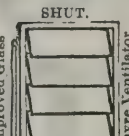


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H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.

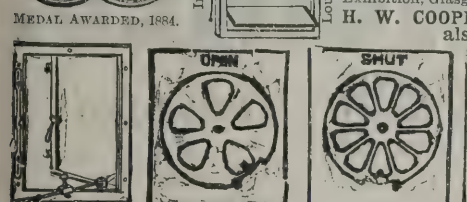
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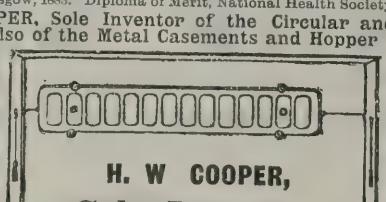
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the bells in a safe and workable condition. When this is accomplished, the beautiful Early English doorway into the nave, with its legendary sculptures, is to be attended to.

AT a meeting of the Grays Local Board a deputation was received from the Orsett Guardians asking the Grays Local Board to receive the sewage from Tilbury, and deal with it at their proposed new sewage disposal works. After discussion it was agreed to receive and deal with the Tilbury sewage subject to terms to be arranged afterwards. Tilbury will contribute an annual payment in proportion to population or volume of sewage. The chief terms necessary to form the basis of an agreement have been drawn out by the engineers to the two authorities. Mr. W. H. Radford, C.E., of Nottingham, is the engineer for the new disposal works and sewers at Grays, and Mr. C. Jones, C.E., of Ealing, is the engineer for the Tilbury sewers.

THE Local Board of Honley, in Yorkshire, have instructed Mr. W. H. Radford, C.E., of Nottingham, to prepare plans and superintend the construction of certain intercepting main sewers with sewage disposal works for the township of Honley. A large amount of dye-water and manufacturers' refuse will have to be dealt with. The local board surveyor, Mr. George Kaye, will prepare plans of the lateral sewers in the town and connect them to the intercepting sewers mentioned above.

THE work of installing the electric light in the Mansion House has been completed. This is the first time in which the Lord Mayor's official residence has been entirely lighted by electricity, and the various reception and state apartments will appear to great advantage on occasions of entertainment.

A LOCAL Government inquiry has been opened as to an application of the Birkdale Local Board to borrow 18,960*l.* for works of sewage disposal, surface drainage, and street improvements.

THE death is announced of Mr. Dugdale, engineer to the Chester Waterworks Company.

WE learn with satisfaction, the *Irish Times* says, that the Christ Church Improvement Fund is so far advanced that the work will now begin, and when finished the locality will be greatly benefited as well as beautified by the change.

IN an account given by Mr. T. Abbott of his first year's experience on the Manchester Town Council he said that the Unhealthy Dwellings Committee had dealt with 413 houses, of which 252 had been ordered to be closed, 2 entirely demolished, 18 were considered worth repairing, 93 adjourned for further consideration, and 48 purchased for the extension of the spaces round the houses in the more congested district in the interest of the health of the inhabitants. There were still in the city 9,240 back-to-back houses to be dealt with—houses which in their present state were totally unfit for human habitation. He regretted the delay that had taken place in the erection of dwelling-houses for the working classes to take the place of those that had been pulled down, but from what he knew of the selected plans he believed that the houses when they were erected would be attractive externally, and that they would be fitted up and finished internally in such a way as would satisfy the most fastidious working-man in Manchester.

ON the recommendation of the Bridges Committee, the London County Council resolved that two resident engineers be appointed, at a salary of 600*l.* a year each, to supervise the works in connection with the construction of the Blackwall Tunnel, and that the matter be referred back to the Bridges Committee, with instructions to submit the names of two persons in their opinion best qualified to fill the appointments.

AT the closing meeting of the autumn term of the Birmingham Pen and Pencil Club, Mr. Jasper Hunt, president, in the chair, a paper on "Ecclesiastical Woodwork" was read by Mr. Christopher Silk, who, owing to the scarcity of good local examples, confined his references to Somersetshire churches, which are particularly rich in fine specimens of early work. Having traced the development of the rood-screen, Mr. Silk described the grotesque treatment of the miserere seats and pew-heads.

AT Boston, during the late gale, the fine old parish church sustained injury. About a ton of the leads on the roof of the south-west corner of the church was dislodged, and a large quantity of the stone coping was blown down.

THE Filey Local Board have made final arrangements for the new sea wall and promenade. The Local Government Board has sanctioned a loan of 10,500*l.* for the purpose. The plans of Messrs. Fairbank & Sons, Driffield, have been adopted. The sea wall and promenade when completed will extend from the Ravine to the southernmost point of Crescent Hill, a distance of 700 yards.

CONSEQUENT on the recent discussions and negotiation, the Manchester Ship Canal Company have ceded the general control of the remaining works of construction to the Manchester Corporation, by the formation of a joint executive committee of seven, on which the shareholders' directors number three,

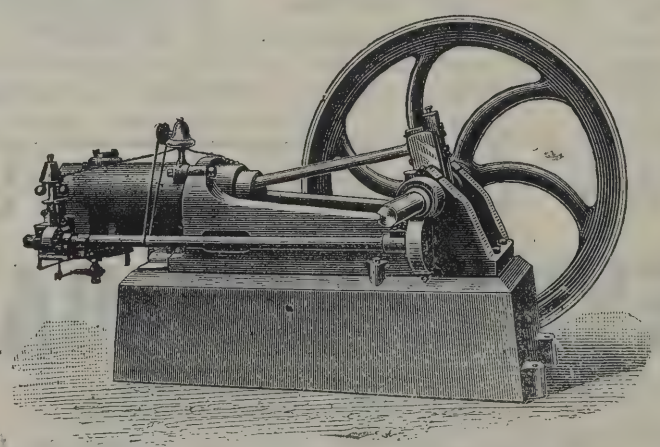
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while the Corporation representatives are four, one of them, Sir John Harwood, being appointed chairman. The intention is to have as much as possible of the work done by contract.

IN the course of the demolition of the remains of the ancient church of St. Martin's-le-Grande, at Dover, the workmen came upon two chalk graves of great antiquity. In one of the graves a beautifully-wrought silver chalice and paten were found, which are believed to indicate the interment of some great ecclesiastical dignitary of the Church many centuries ago. The church of St. Martin's-le-Grande was built in the early part of the seventh century, on the foundation of some ancient Roman baths.

THE Bradford Board of Guardians intend to apply for borrowing powers to the extent of 8,000*l.*, for the purpose of providing a new ward for imbeciles at the workhouse.

THE Huddersfield Town Council have appointed Mr. Mountain, of Newcastle-on-Tyne, electrical engineer to the Corporation.

CHICAGO EXHIBITION NOTES.

THE monster Manufactures and Liberal Arts Building requires more than 200 car loads of lumber, or 3,000,000 feet, for its flooring alone, and five car loads of nails to fasten it down. Three electric saws are kept running night and day sawing and sizing the flooring. Twenty buildings of the size of the auditorium, or 1,000 houses 25 by 50, could stand on this mammoth floor.

MEDUSALINE, a new composition designed as a substitute for brick and building stone, has been adopted for the sidewalks and driveways in the exposition grounds. The Committee on Grounds and Buildings granted the contract to the Medusaline Manufacturing Company of Chicago for the construction of 450,000 square feet of such sidewalks and driveways. The price is 6½ cents per square foot. The concrete composition to be used by the contractors is said to be as hard as perfect stone, and it is now thought probable that it will be used instead of staff for the exterior ornamentation of the Fine Arts Palace and several other buildings.

WYOMING'S building at the Fair will be of the French château style of architecture, 50 by 70 feet, two storeys high, and will cost about 20,000 dols.

THE great dome of the Administration Building, which will be the most conspicuous architectural feature of the exposition, and the four smaller domes, will be covered with aluminium bronze, a newly discovered amalgam, which is said to glisten brighter than gold. The contract for gilding the domes has been let for 54,000 dols.

CEYLON has sent, through Sir Henry Wood, a request for space upon which to build a tea-house.

NEARLY 700,000 dols. of insurance has already been placed on the exposition buildings in process of erection.

DIRECTOR-GENERAL DAVIS has made a report to the Committee on Awards in which he says that 142 juries, embracing 659 jurors or judges, will be necessary at the exposition. He believes that appointment on these Juries of Award will be considered a high honour, and that a better class of jurors will be secured if no salary is offered. He recommends, however, the payment of six dollars a day to each juror in lieu of expenses. He thinks a prize of 500 dols. should be offered for the best design for a medal, two prizes of 250 dols. for the next best two designs, and like prizes in case of designs for diplomas. The Government is expected to appropriate about 500,000 dols. for carrying out the awarding of the medals and diplomas. It is hoped, too, that the medals will be struck in the Government building at the exposition, and the diplomas will be prepared in the Bureau of Engraving and Printing at Washington.

MR. SALLUS, an artist of Ecuador, will execute especially for the World's Fair two paintings, one a scenic painting of Chimborazo, and the other a life-size portrait of Columbus.

THE party which, under the direction of Chief Putnam of the Department of Ethnology of the exposition, has been making excavations of the mounds in Ohio for three months or more, met with rare success on November 14 near Chillicothe, in making one of the richest finds of the century in the way of prehistoric remains. While at work on a mound 500 feet long, 200 feet wide and 28 feet high, the excavators found near the centre of the mound, at a depth of 14 feet, the massive skeleton of a man encased in copper armour. The head was covered by an oval-shaped copper cap, the jaws had copper mouldings, the arms were dressed in copper, while copper plates covered the chest and stomach, and on each side of the head, on protruding sticks, were wooden antlers ornamented with copper. The mouth was stuffed with genuine pearls of immense size but much decayed. Around the neck was a necklace of bears' teeth set with pearls. At the side of this

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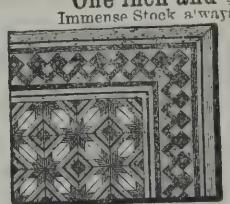
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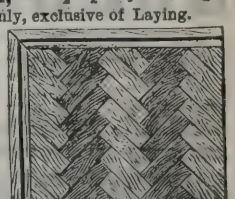


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skeleton was a female skeleton, the two being supposed to be those of man and wife. It is estimated that the bodies were buried fully 600 years ago. The excavators believe they have at last found the king of the mound builders.

THE Polytechnic Institution, Regent Street, London, intends to conduct a series of excursion tours to the World's Fair for the accommodation of people in moderate circumstances. It has now contracted with the Inman Steamship Company, which owns the *City of Paris*, *City of New York*, and other fast steamers, to transport parties weekly.

COMMISSIONER MCCORMICK writes from London that Mr. Armstrong will soon arrive in Chicago, his purpose being to present to the authorities of the exposition a project to reproduce the Tower of London.

DANIEL C. FRENCH, the New York sculptor, is now in Paris working on a colossal statue of the Republic for the World's Fair. It will show a female figure nearly 70 feet high.

THE American sculptor, MacMoines, is also in Paris working on the great fountain which will be placed in front of the Administration Building. The fountain will have thirty gigantic figures.

INCANDESCENT GAS.*

IT is now about seven years ago that the Austrian Doctor of Chemistry, Dr. Auer von Welsbach, completed his experiments in utilising some of the rare earths for lighting purposes, and about five years ago his invention was first introduced in this country. No doubt some of you know of what his invention consists. It has long been doubted whether the ordinary method of using gas directly as an illuminant is either the best or the most economical, and a long time back those best acquainted with gas-lighting came to the conclusion that the gas should not be used as a direct illuminating flame, but that the proper form of utilising it should be through its heat; the great objection, however, to this course was the difficulty in finding materials which could be brought to incandescence by ordinary pressure with very small heat, and the production of such a lamp as would carry out this idea. There are various inventors who, from 1820 to the present time, have been employing their brains on finding out means for solving this most difficult question, but I do not hesitate to say that all these systems brought out failed very soon, and none of all the incandescent gas-light systems have stood the test of time so well as the invention of Dr. Auer's. In giving you the outline of his invention, I may mention that Dr. Auer was a pupil of Professor Bunsen in Heidelberg, and it is under that eminent savant that Dr. Auer studied the rare earths, and learnt how to treat them and extract them, and the spectroscope is almost the only and the surest guide in the test of the purity of these rare earths. Dr. Auer made zircon and lanthan his special studies, and he was the first who discovered that yttrium was not an element, but was split into Brassidimium and Needimium. He soon found out that the heat-resisting property of all these earths was enormous, and he worked out a combination by which several of these rare earths, used in a hood of cotton, produced with a small Bunsen flame a brilliant light, and it was in this form that the incandescent light was introduced into this country. When, in 1887, the Incandescent Gas Company was started, there was an enormous rush for the light, which proves that an improved gaslight was at that time a greatly-felt want. Business went on in a very satisfactory way for about three months, and then the troubles of this company began. When first supplying the English public with a mantle or hood, this mantle was saturated with a fluid made out of the above-mentioned rare earths in such a proportion that these mantles gave a brilliant white light for about 800 hours without any decrease of light; but there was one of the chemicals used at that time which could only be obtained in small quantities, and in supplying lamps in England for about three months Dr. Auer had run out completely the stock of the material that is the most heat-resisting, and the company had to fall back upon a combination of these rare earths, which would give a perfectly good light for two hundred to three hundred hours; but then the decrease in the light was so great that after that time the light decreased; and turned into a reddish sort of colour, which was only very little better than ordinary Argand burners. In consequence of this fact the system got a very bad name, which, with the bad management of the company at that time, was the reason that instead of making a steady advance the incandescent light became less and less a favourite with the public. In the meantime, researches after the material we use for this fluid have proved that there is plenty of it, and that the metals we require are so plentiful that any amount can be obtained; and having pro-

* A lecture delivered by Mr. Moeller, Admiral Sir E. A. Inglefield, K.C.B., chairman of the Incandescent Gas Light Company, Limited, 14 Palmer Street, Westminster, London, S.W., in the chair.

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cured a good supply of each of them, the company about two years ago began to make the fluid according to the original receipt of Dr. Auer, and we must state that from that date the incandescent gas light has made a steady but sure advance, and the fact that from September to December last year we sold nearly 20,000 lamps proves that the system has many friends now. These mantles we have supplied for the last two years have a capacity of 25 to 28 candle-power, and they would burn without much decrease in light for about eight hundred hours. To-day I have to draw your attention to an invention which has been made by Dr. Auer, which will make our system one of the most economical and efficient amongst the various ways of illumination. Dr. Auer has succeeded in finding a rare earth, whose fire-resisting power is so great that no known heat is able to melt it, and this material, in connection with our hood, produces an incandescence that is absolutely startling. To give you a fair idea of the lighting capacity of this new mantle I will compare this new light with some of the best-known other systems in the market, and to show you that I do not mean to put figures as to candle-power before you which I cannot substantiate. I have all these burners on the ramp before me, and you may compare them for yourself if you like. We have in the testing-room of the laboratory a photometer, and those of you gentlemen who would like to make photometrical tests of our light and the others I show you are invited to let me know, and I will put the photometer at their disposal with the assistance of our chemist, Mr. Mackean. To begin with, I have an ordinary Bray's burner, No. 6, and with a pressure of 1 inch this burner passes per hour 7·5 feet of gas, and with our London gas this would give no more than 14 candle-power of light. The next burner I have here is a large Argand burner. This gives at 1-inch pressure, with 7·5 feet of gas per hour, 26 candle-power, so you see that the consumer gains already 12 candles from the same amount of gas if he uses an Argand instead of a Bray's burner. A third burner is our Welsbach burner as sold up to the present moment. This burner passes 3 feet of gas, and with this 3 feet of gas gives about 25 candle-power of light, and the durability of the mantle I would average at 800 hours. Here you find already that with our lamp you get an equal amount of light as with the Argand burner, with the difference that we use only 3 feet of gas where the ordinary Argand burner uses nearly 8 feet. The next lamp is our new light, which we are able to introduce to the public. This burner passes 3 feet of gas, like our old Welsbach burner, and the candle-power obtained on the photometer is equal to 60 candles with 1-inch pressure. If the pressure is always six-tenths to nine-tenths, we do not get the same amount of light, but still we are able to get with the six-tenth pressure of gas about 35 to 40 candle-power. The mantle that is on this burner will give this light for from 2,000 to 3,000 hours. After having burnt 2,000 hours, then the light begins to diminish, and between 2,000 and 3,000 hours the light would vary from 60 to 50 candle-power; but for practical purposes even 40 candle-power would be called a brilliant light, and 50 candle-power can certainly not be termed otherwise than splendid. I have compared up to now our light only as regards illuminating power, and if you consider the cost of the same, you will find that though at first the expense for putting up our lights is rather considerably more than, for instance, Argand or Bray's burners, or any other gas burners in the market, the saving of gas with our light is so enormous that the first outlay pays itself in a very short time indeed; and we have found that all those who have studied our light carefully, and who had a sufficiently large installation, are in every way satisfied with the light. If you take it only that our burners consume only half the amount of gas against other burners, the saving would be about 50 per cent. in the gas bill; against this must be reckoned the expense of the lamp and the mantles, and on an average each burner costs a householder about 1*l.* a year, so that there is a saving with our light to the amount of about 10*s.* per burner, less one or two mantles. But I beg to point out to you that there is an actual saving to a large amount in the gas bill, where for the same amount of money you get a better light, a purer light and a steadier light.

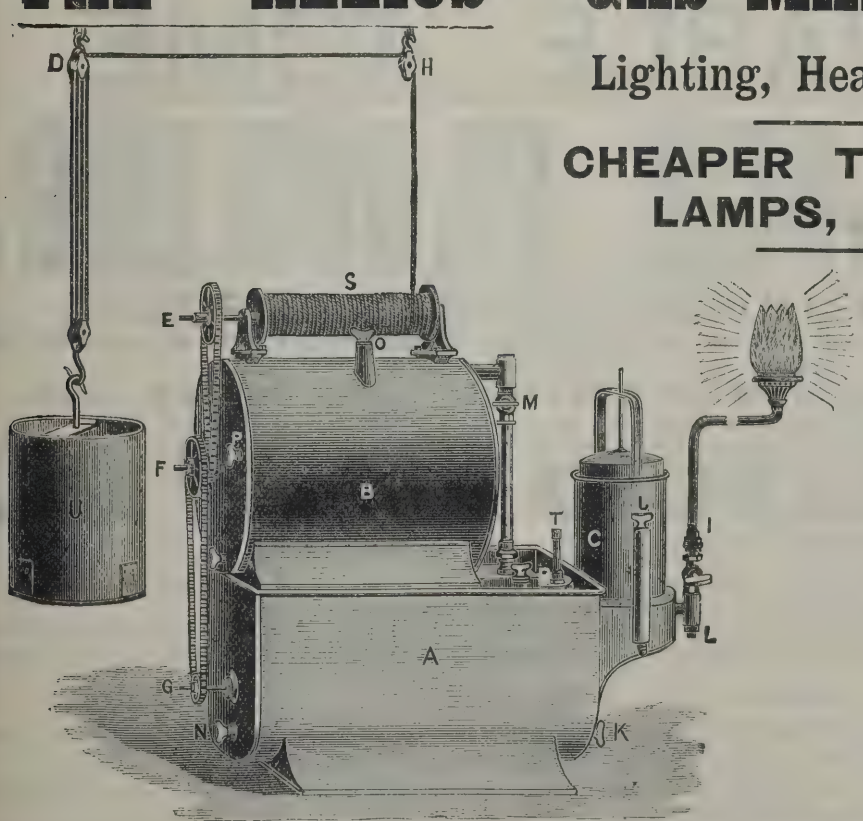
No doubt you will say that with the enormous strides electricity has made for the last few years that this invention comes a little late in the day, but here, again, I myself am very hopeful, and I do not doubt that electricity will find in this light a most serious competitor. The electric incandescent lamps give on the average 18 candle-power, and although it is very difficult indeed to obtain an estimate for the actual working expenses of an electric installation, we have found out, part through our own customers and part through information from electric engineers themselves, that the cost of electricity against our light stands about 10 to 1. If a place with 500 lamps had to be installed with electric light it would cost about ten times as much to put the lights in and to keep them going as our own lights would. We would give with our own lights on an average of 60 candle-power a total lighting power of 30,000 candle-power, whereas an electric incandescent lamp at an

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average of 18 candle-power in the same rooms would only give an illuminating power of 9,000, which would mean that we give about three times the amount of light that electric light would be able to give. Our lamp, as it stands before you, is constructed in such a way that anybody can fix it up, and there is no trouble whatsoever in keeping the light in order. The burner is simply screwed on to an ordinary gas-fitting, the mantle is fixed on, after which the mantle is burnt off to free it from certain chemicals, which render it more resisting against breakage in travelling, after which the chimney is put on, and the mantle will begin its duty as a light. I may mention that at the present moment we have sufficient material on hand to manufacture these lights in any quantities, and failing or breaking down of the system as in 1888 is at the present moment impossible, and we look forward, though we know perfectly well that we have to overcome enormous difficulties, to convert the prejudice that still clings to our old incandescent system. We are certain that in the long run we will succeed in introducing our system not only into the better houses and places, but ultimately into every household where a cheap pure light is desired. It need only be known amongst the general public that the advantages of our system are to the extent stated to you before, when they will surely come to use the light, and we on our part shall do everything to study the wants of the public, and we shall try to satisfy them as far as we can.

I come now to another matter which it is not very pleasant to touch, that is, gas companies. We find out that gas companies in general are dead against our light, because the consumption of gas with it is reduced to such an extent that if our light was generally adopted to-day all over England, it would certainly lead to an enormous falling off in the revenues of the gas companies : but this fear is quite unjustified, because we have found the demand for light increase, and for this reason gas companies would have very little to fear.

I have now given you pretty nearly as much information as I think will interest you, and before concluding I should like to say a few words about our "Helios" gas-making machine. It is now about six months ago that we introduced this machine for the purpose of lighting country houses, factories, hotels which are out of reach of ordinary gas companies, and which cannot adopt electricity on account of the expensive installation, and we are very happy to state that up to the present we are very successful with the machine. You all know that if the lighter hydrocarbons are brought in contact with a draught of air that they will vaporise and give off a mixture of air and hydrocarbon, which has a great illuminating and heating power. The machine you see here contains in the top part a blower or an ordinary meter-wheel, which sucks in the air and forces the air into the tank, which contains a revolving carburettor. In passing through this carburettor the air vaporises, a certain amount of this hydrocarbon goes out through a tube as a so-called gas mixture, which we use for lighting purposes. Downstairs in the showroom you may see the light in working order, and the factory at the present moment is lit with this light in conjunction with incandescent burners. You can convince yourself of the results obtained, and I shall be very pleased to answer any questions as regards the incandescent gas-light or this "Helios" gas-making machine which you may choose to put.

THE LONDON COUNTY COUNCIL SCHEMES IN PARLIAMENT.

UNDER their General Powers Bill, deposited by the County Council, power is sought to carry out street improvements in Cromwell Road and in Spitalfields; to acquire land in Clerkenwell for Fire Brigade purposes; to exchange land at the southern end of Peckham Rye for certain other land adjoining Peckham Rye Common; to purchase Fairseat House, Highgate, adjoining Waterlow Park, for the purpose of dedicating the same to the recreation and enjoyment of the public; to purchase Lincoln's Inn Fields Gardens; and to extend the time for the compulsory purchase of land for the purposes of the Blackwall Tunnel works. With regard to water supply, both the County Council and the Corporation of the City have deposited Bills providing for the appointment of a water committee, with power to promote schemes in Parliament for the acquisition, construction and maintenance of waterworks in order to afford a new or supplemental supply of water to the metropolis, to acquire or lease existing or future waterworks, providing for the dissolution and winding up of any water company, and for these purposes to raise further capital. Powers are also sought for making and enforcing regulations similar to those now issued by the existing water companies as to the character and material of all fittings and appliances, and to enable the County Council and the Corporation to hold public or private inquiries into the existing supply of water within the metropolitan area, together with the charges made for the same,

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and into any possible future sources of supply. By another Bill it is sought to empower the London Financial Association, the Middlesex County Council, the Corporation of London, the London County Council, and the Hornsey, Tottenham and Wood Green Local Boards to purchase or lease the Alexandra Palace and grounds. While the County Council, in its Subways Bill, requires the several gas and water, telephone and electric light companies to make use of subways for the reception of all their mains, pipes and wires, the National Telephone Company ask to be allowed to erect additional overhead wires.

BOLTON TECHNICAL SCHOOL.

THE architects for the Bolton Technical School, Messrs. Bradshaw & Gass, have sent in the subjoined report to the committee :—

We herewith forward a complete statement of accounts of estimated expenditure to date. The amount expended on the buildings and fittings is 4,054*l.*, on machinery 4,003*l.* It is estimated that to complete a further sum of at least 700*l.* will be required, making a total of 8,757*l.* Subscriptions and donations amount to 7,950*l.*, of which 720*l.* is to be applied to clear off the liabilities on the buildings and 121*l.* expenses incurred in various ways, leaving 7,109*l.* available. This causes a deficit of 1,648*l.*, and a further sum of 800*l.* could with advantage be expended, mainly on tools and additional fittings. During the progress of the alterations it has been found necessary to undertake works which were not originally contemplated. These were caused by the buildings not being as sound as was expected (it being found desirable to strengthen the construction in many parts), by the bad state of the basement walls, drainage, roof and portions of the floors revealed during the progress of the buildings, and by additional work to the cotton-spinning and hosiery rooms, where much valuable machinery is being placed. The buildings are now in a perfectly good and satisfactory condition, stable in every part, and future repairs will be unnecessary. The recent experience at the Manchester Technical Schools, and the additional machinery presented and contracted for, made it desirable to increase the power for driving ; and to avoid supplementary engines being necessary, instead of two gas-engines 42 horse-power, three gas-engines 78 horse-power are being put in, and so arranged as to give greater economy in the use of gas for working under varying conditions. Wood-working and sloyd training departments have been increased, other portions of the building have been better adapted fo technical teaching purposes, and the general arrangements of the departments have been improved on first intention. These additional works, which were absolutely necessary, have inevitably entailed expenditure beyond that contemplated, but the greater portion has been expended on works which will reduce the annual outlay and give better facilities for teaching operations. An inspection of the building shows that every point has been carefully considered, and that in general working arrangements and appointments it is admirably adapted for technical teaching.

The extra works absolutely necessary are as follows :— Additional cost of enlarging cotton spinning-room and new skylights where rotten, &c., 200*l.* ; taking up floors in lecture-room and trussing beams and putting in new floors where floor rotted, and strengthening floor for hosiery and weaving, 190*l.* ; new gutters to roof and general repairs to same, 80*l.* ; extra cost of work in basement occasioned by ground being saturated with sewage-matter, 120*l.* ; putting damp-proof course round building and underpinning to foundations, 130*l.* ; foundations for gas engines and electric lighting, 150*l.* ; rebuilding wall on Bold Street side to give additional width in engineering department, 95*l.* ; extra weight of iron beams, pillars and tie-rods to strengthen building, new pillars, stones, &c., 100*l.* ; making good defective walls, 70*l.* ; total, 1,135*l.*

THE ROYAL HOSPITAL, KILMAINHAM.

A PARTY of members of the Royal Society of Antiquaries visited the Royal Hospital of Kilmainham, outside Dublin. They were courteously received by Lord Viscount Wolseley, K.P., Commander of the Forces, who is a Fellow of the Society. His lordship pointed out the objects of interest, principally armour, arranged in the great hall of the hospital. The charter of Charles II. was also shown. Lord Wolseley has caused the walls of the great hall to be decorated with trophies and armour, the great portion of which were removed from the Pigeon-house Fort. The chapel is being restored, so that the hall is now used as a temporary chapel. The party then visited the adjoining churchyard ("Bully's Acre"), and inspected the remains of the cross said to have been erected over the grave of Brian Boru's son, Murrough, who was killed at the battle of Clontarf A.D. 1014.



Kilmainham derives its name from St. Maighnenn, who was bishop and abbot there at the beginning of the seventh century. On the site of the earlier monastic establishment Strongbow founded, in 1174, a priory, under the invocation of St. John the Baptist, for the Knights Templars. This military order, which had been founded with the object of protecting pilgrims proceeding to the Holy City, gradually acquired extensive grants of land in many countries in Europe, together with extraordinary privileges and immunities. The dress of the Order was a white mantle, with a red cross over the left breast. Their banner, half black and half white, was called "Beauseant." Strongbow's grant of Kilmainham was confirmed by Henry II.; it became the principal house of the Templars in Ireland, and its prior had a seat in Parliament. The first prior was Hugh de Cloghull. The Priory was enriched by grants of land and advowsons of churches in various parts of Ireland. The vast possessions and enormous wealth of the Order, embracing in Europe, it is said, 10,500 manors, together with the privileges it enjoyed, made it a formidable power. Charges of idolatry and other heinous crimes were brought against the Templars in France in the beginning of 1307, and resulted in the Order being suppressed by the Pope, Clement V. Edward II. directed a mandate, dated December 20, 1307, to Sir John Wogan, the Justiciary of Ireland, to seize the persons, property and documents of all the Templars in Ireland on the Wednesday following the Feast of the Epiphany, and enjoined him to execute the order without delay, and before reports of what had been done in England could reach Ireland. In spite of the precautions taken the order was not effectively carried out, for by writ of September 28, 1309, the King directed the Justiciary to apprehend all Templars who had not yet been seized, and confine them in the Castle of Dublin. The last Grand Prior of the Temple in Ireland was Gerald Fitz Maurice, fourth son of Maurice, Lord of Kerry.

In 1312 Henry Tanet, late Master of the Templars, and other brethren who had been till then kept in custody, were brought to trial in St. Patrick's Cathedral, before commissioners appointed by the Pope, and being condemned, the Order was entirely suppressed and their possessions were transferred by the Pope to the Hospitallers or Knights of St. John of Jerusalem. The King confirmed the grant after protesting against the power of the Pope to make it.

The Knights of St. John of Jerusalem, also called Knights of Rhodes, and subsequently of Malta, from having their headquarters in those islands, were a military Order, somewhat similar to the Templars. Their habit was black, with a white cross of eight points on the left shoulder.

Several of the priors of Kilmainham filled the office of Lord Chancellor of Ireland, and Roger Utlagh filled the office of Viceroy from 1328 to 1331; as did William de Taney, 1372–73.

In 1408 a battle was fought with the Irish near Kilmainham, in which the Lord Lieutenant, Prince Thomas of Lancaster, afterwards Duke of Clarence, second son of King Henry IV., then in his nineteenth year, was severely wounded, and narrowly escaped being slain.

In 1413, Prior Thomas le Botiller, son of James, Earl of Ormonde, proceeded in command of a body of troops to the war in France, and took part in the siege of Rouen.

In 1444, Prior Thomas FitzGerald offered to support a charge of high treason against the Earl of Ormonde by single combat. Lists were prepared at Smithfield, in London, and a day appointed, but the King forbade the fight.

The famous Parliament held by Sir Edward Poynings at Drogheda enacted that whoever was made prior of this hospital by the Grand Master of Rhodes, or by his deputy, should be a man born in England.

Sir John Rawson, who became prior in 1511, at the dissolution of the monasteries in 1540 surrendered the priory and all its possessions to the Crown. He was granted a pension of 500 marks, and in 1541, as a compensation for the loss of his position as a spiritual peer, was created a temporal peer by the title of Viscount of Clontarf, which had been part of the possessions of the priory. After the accession of Queen Mary the priory was restored by Cardinal Pole, the Papal Legate, and Sir Oswald Massingberd appointed prior, and was the last prior of Kilmainham.

In 1680 King Charles II. directed the building of a hospital here for the maintenance of ancient and maimed officers and soldiers of the army in Ireland, near to the old building called the Castle of Kilmainham. The Royal Hospital was erected, after a design of Sir Christopher Wren, at an expense of 23,559*l.* It is a quadrangular building, two storeys high, enclosing an area of 210 feet. The north entrance, of the Corinthian order, is surmounted by a square tower, clock turret and octagonal spire. The dining-hall, 100 feet long, is wainscoted with oak, and contains portraits of most of the sovereigns and viceroys. The chapel has an ornamented ceiling, and the east window is the gift of Her Majesty. The Master is generally the Commander of the Forces in Ireland, who makes the hospital his official residence.

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THE MANCHESTER INFIRMARY EXTENSION.

THE following letter on behalf of those trustees who are opposed to any extension on the Piccadilly site has been addressed to the Board of Management of the infirmary :—

December 10, 1891.

Dear Sir,—Referring to my letter of October 30 and the memorial addressed to your board by those trustees who are opposed to the extension of the infirmary at Piccadilly, I have respectfully to request you to bring under the consideration of your board the annexed suggestions for an extension of the infirmary at Stanley Grove or on some other site near to the Owens College. Those trustees who are opposed to any extension on the Piccadilly site feel that it would be extremely difficult, if not impossible, to make a successful appeal to the public for funds for any extension unless there is unanimity of action, and that with an opposing board, and the trustees divided into two sections, a deadlock would ensue, as the result of which nothing could be done either at Piccadilly or elsewhere. They therefore feel that it is extremely desirable that the consideration of the question of extension should be entered upon in a spirit of compromise, trusting to the experience of the future to evolve whatever further reforms may be found to be necessary. In drafting the annexed suggestions the following points have been carefully kept in view :—

(1) That the infirmary trustees would have to find a considerable sum to erect and maintain the hospital, and that their representatives would have the trouble and anxiety of administering its affairs. (2) That as the infirmary by its Act of Parliament exists for the benefit of "the sick poor," its funds can only be spent in the furtherance of this object. They can only be devoted to promoting the interests of the medical school in so far as these tend to further the interests of the patients. (3) There are, therefore, practical difficulties in the way of the infirmary taking any part in or being responsible for the proposed hospital, unless it becomes the property of the infirmary trustees and an integral part of the institution.

As a result of keeping these points well in view, the suggestions for an extension in Oxford Road make it a fundamental condition that both the extension and the existing infirmary shall be placed under one management, composed of the representatives of the infirmary trustees. I am to add that, as the result of considerable inquiry, my committee have reason to know that these suggestions would be regarded very favourably by many of those who desire to see that full and practical co-operation between the infirmary and the college which is so necessary for the efficacious treatment of "the sick poor" of the district, and for the perfecting of a great medical school in Manchester. They believe that the consideration of the suggestions would lead to a settlement of those questions which at present bar the way to so important and desirable a co-operation. My committee are of opinion that it is not only courteous to your board, but necessary for the proper consideration by them of any new plan of extension, that these suggestions should be placed before them.—I am, &c.,

ANDREW A. GILLIES, hon. secretary to the Memorialists.

W. L. Saunder, Esq., secretary, Manchester Royal Infirmary.

Suggestions.

(*a*) That a hospital (to contain, say, 150 beds) should be erected at Stanley Grove, or elsewhere in the neighbourhood of the Owens College, on land transferred to the infirmary.

(*b*) The infirmary trustees to provide the funds to erect, equip and maintain such hospital. This would involve an expenditure of probably 50,000*l.* to 60,000*l.* and the necessary provision for maintenance. The friends of the college should unite with the infirmary board in an appeal to the public to provide these funds, more especially as a portion of the new buildings would probably be required for purely teaching purposes.

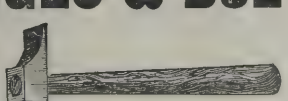
(*c*) The hospital should be the property of the infirmary trustees, and be managed by their board.

(*d*) A large proportion of the beds in the proposed hospital should be for the reception of medical cases, the beds at the infirmary being devoted mainly to surgical cases.

(*e*) Certain of the college professors should, *ex-officio*, be members of the infirmary staff, and have beds allotted to them at the new hospital and at the infirmary. Every member of the honorary staff would be subject to the rules of the infirmary board.

(*f*) The honorary staff of the infirmary should in future be elected by a committee consisting of members of the infirmary board, of representatives of the college, and of certain other representative men.

(*g*) There should be an increase in the number of the physicians and surgeons at the infirmary. The proposed extension would make this a necessity.

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(*h*) There should be a revision of the present system of dividing the amount of the fees paid by the students to the members of the infirmary staff. A certain proportion of the fees should be paid to the infirmary board, especially as its proposed more intimate connect on with the school will imply additional expenditure.

(*i*) There might be one or more representatives of the college on the infirmary board and a similar number of representatives of the infirmary on the managing body of the medical school.

(*k*) The teaching of the infirmary should be correlated with that at the college.

TRADE RULES.

THE following are the working rules and regulations for the house carpenters and joiners of Edinburgh and Leith approved of by a Board of Conciliation, consisting of seven employers and seven operatives :—1. For competent workmen the standard rate of wages to be 7½*d.* per hour, and to be paid weekly. 2. The regular working hours to be 51 per week—*i.e.* 9 hours per day for five days, and 6 hours on Saturdays, except as after provided for. Work to begin at 6, 6.30, or 7 A.M., and to cease at 5 P.M., and 1 P.M. on Saturdays. During winter months the hours to be as follows, viz.:—From November 4 to November 18, 8½ hours, Saturdays 5 hours ; from November 18 to December 2, 8 hours, Saturdays 5 hours ; from December 2 to January 6, 7½ hours, Saturdays 5 hours ; from January 6 to January 20, 8 hours, Saturdays 5 hours ; from January 20 to February 10, 8½ hours, Saturdays 5 hours. All time in addition to the foregoing to be paid for at the rate of time and quarter up to 10 o'clock P.M., and after that hour double rate of pay to be allowed; but these extra rates are only to take effect after a week's work has been wrought, except in the case of men taken on during the week. Wages to be paid at the regular time of ceasing work, or sufficient time allowed to travel to workshop for these. 3. Within the municipal boundaries of Edinburgh and Leith, men to reach their work and travel from the same in their own time. If not over four miles beyond the boundaries, 6*d.* per day to be allowed, or travelling time to and from these ; but if over four miles, to be allowed 4*s.* per week, and railway fares when sent to and from the job. When men are taken on for or at a country job, this rule does not apply. 4. After 30 hours' work with an employer, men to be allowed one hour to put their tools in order ; and after 51 hours, two hours for that purpose. 5. Employers to provide means for workmen warming their meals at outside jobs and in workshops, and to find some one to attend to the same. Also to make provision for the safety of tools. 6. No piece or task work to be wrought by workmen, and no sub-letting unless sub-contractor supplies plant and material. No materials to be carried for employer, except in working hours. The above rules and regulations to come into force on the first day of January 1892.

WATER POWER IN FLEET STREET.

THE *Daily News* gives the following account of an interview with Mr. Ellington concerning the high-pressure system at work under London streets :—

A new eruption in Fleet Street, though not so serious as when last the pavement was up. Ludgate Hill is likely to follow suit, and sooner or later Chancery Lane, Bridge Street, Farringdon Street, wherever loads of passengers or of goods have to be raised cheaply and expeditiously. The hydraulic engineers are at work developing Bramah's invention, just as the electrical engineers are developing Faraday's. In Fleet Street they are putting their "mains" down for the first time. By "they" I mean Messrs. Ellington & Woodall, of Palace Chambers, Westminster. These gentlemen have burrowed their way through fifty-three miles of the soil of London in about half-a-dozen years.

"Not easy work always, Mr. Ellington?"

"No ; we have to feel our way about gas-pipes, sewage mains, water-pipes, telephonic mains, electric mains and so forth. At a certain spot in the City we were brought to a dead stop, so that we had to turn about and make a detour by one or two streets. Underground London is in some parts so closely packed that further excavation is impossible. 'Subways?' Yes, with subways this inconvenience might be avoided ; but, as a matter of fact, the cost of constructing subways would be so enormous that we must regard them as impracticable."

Underground London's network of sewer-drains, water-pipes, gas-pipes, hydraulic pipes, &c., spread through a hundred and twenty square miles or so of soil, must be about as intricate as the arteries and veins of the human body.

"Here is the map of our operations. The red lines along the streets indicate our fifty-three miles of mains. In 1887 we

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had only twenty-five miles. You see our system extends from near the West India Docks to Hyde Park Corner in one direction, and in the other from Mint Street, south of the river, to some distance beyond Old Street, north of it. But we shall soon push on beyond the Old Street limit, and we are to have a new pumping-station near it, from which station hydraulic power will be available for houses and places of business over a large and new area of northern London."

And now a word or two about the pumping under Ellington & Woodall's high-pressure system. Everybody knows in a general way what hydraulic power means. But very few know how it is manufactured on the Thames. I must condense his account of it, just as I have in the foregoing paragraphs summarised his conversation—apprising the reader that if there are any mistakes they are mine and not Mr. Ellington's. Here, then, is the principal fact—the pressure produced at one of the London Hydraulic Power Company's pumping stations is as great as it would be if the accumulators, or tanks, instead of being subjected to steam-power close to the earth's surface, were elevated 1,700 feet above the pavement of London streets, and left to exercise their pressure downwards from that height. Suppose there was a waterfall 1,700 feet high—five times the height of St. Paul's—at Southwark Bridge pumping-station; if the falling water came through a pipe with, suppose, its bottom end turned up like the tail of the letter "t," it would spurt up to a considerable distance, because of its tendency to recover its level. The hydraulic lift on which the reader is carried to the upper floors of his club, or place of business, or residential "barracks," is, mechanically-speaking, pushed up by a spurt of the above description. But as there are no reservoirs at a height of 1,700 feet to produce "pressure headway" in the hydraulic pipes that are laid down beneath the pavements, the necessary pressure is produced by powerful pumps—the pressure in the accumulators amounts to 750 pounds upon every square inch. I must not burden Mr. Ellington with the responsibility for the illustration of a T-shaped tube five times the height of St. Paul's; the illustration is mine.

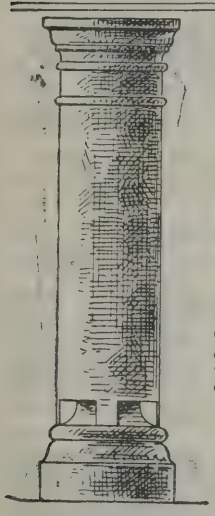
"We have three pumping-stations," Mr. Ellington told me, "one at Falcon Wharf, a short distance to the east of Blackfriars Bridge; another at Millbank, Westminster; a third at Wapping; and we shall have a fourth in the City Road, at the spot I have already mentioned. All the water we use is taken from the river, but it is most carefully filtered before it is passed on into the mains." The word mains means main pipes. From the street hydraulic main pipes are led off to houses and places of business, just as gas and water pipes and electric wires are. "What happened," Mr. Ellington resumed, "when you came up to this floor of Palace Chambers by the hydraulic lift? The attendant turned a cock; that permitted the rise of the water in the hydraulic pipe, and with the thin column of water the lift rose. When the attendant wanted to lower his lift he simply turned another cock, which allowed the water to escape as waste into the sewers. As the water escaped the lift descended."

"That lift by which you have come up is only one of 1,470 which our company have already at work in London. You will notice that they are more densely distributed over the City than elsewhere. The reason is that hydraulic lifting-power is particularly suitable for commercial places. Steam-power, condensed air and electric-power are particularly well fitted for lifting weights in manufacturing localities; but, as I have said, for warehouses, offices, commercial quarters, as distinguished from factories, for residential chambers, hotels, clubs, the best lifting-power is hydraulic-power. It is the safest, simplest, cheapest, best plan of lifting weights. In this kind of work hydraulic engineering need fear no rivalry whatever."

"I wish," I said, "you would invade the platforms of the District and Metropolitan Railways. Gower Street Station, for example, and Portland Road Station, Westminster, Farringdon and the rest, where you have to rush up and down long flights of narrow and more or less tortuous and slippery stairs."

"There certainly is room there for hydraulic carriage," Mr. Ellington admitted. "You know that on the electric railway from the City to the Surrey side passengers are lowered from the street to the trains and raised from the trains to the street by hydraulic platforms. The same arrangement is to be carried out on the new electric railway which is going to be constructed. And there is another and extremely important use to which hydraulic power may be turned for the public good. I mean its use for fire-hydrants. That was Captain Shaw's strongly-expressed opinion. You can imagine how easily a jet of water with a pressure of 1,700 feet could squirt over a building 100 feet high. I am surprised the County Council have not taken the matter up."

It is well worth recording that the old house at the Blackfriars pumping-station is believed to have been occupied by Sir Christopher Wren during the building of St. Paul's Cathedral. In the West-end of London one of the most remarkable developments of hydraulic engineering is the growing use of lifts in

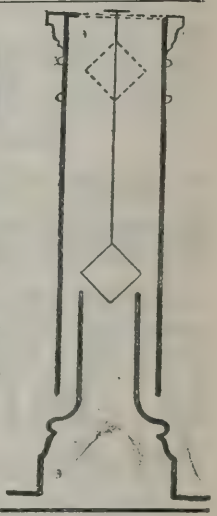


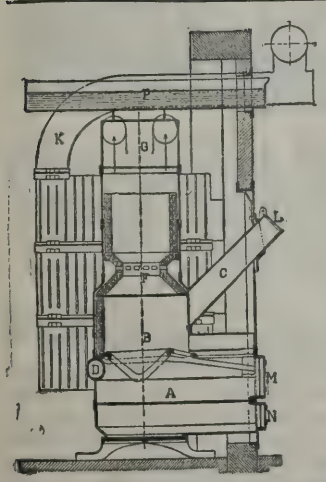
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NEW RAADZAAL, BLOEMFONTEIN.

OUT of fifty designs submitted in competition for this building in 1883, those prepared by Mr. Lennox Canning (Lennox, Canning & Goad), of Johannesburg, were selected. Eventually the building was commenced in April 1890, though, owing to reasons of economy, if not of parsimony, portions of the design were abandoned, the late T. R. Robertson, of Johannesburg, being the contractor. According to the architect's description, the Raadzaal is approached by a circular lobby under the dome and access to two side lobbies is obtained therefrom. Two stone spiral staircases lead to the gallery and rooms contiguous thereto. A lofty and spacious grand portico approached by a flight of stone steps faces the lobby of the House, and two semi-circular porticos of smaller size flank the other entrance doors, whilst a wide colonnade spans the entire distance from the west eastward so far as the office buildings. These porticos and colonnades are supported by stone columns (about 24 feet high and 2 feet 3 inches in diameter at the base), on which will rest the stone cornice, frieze, architrave and balustrade. Surmounting the main walls of the central lobby the dome is to be built, and is now in a forward state. This part of the superstructure is entirely of stone, designed with eight semi-arched openings. The dome is covered with pressed zinc tiles resembling the scales of a fish, the ribs or intersections being of boldly-designed rope-pattern in malleable zinc. Above the dome rises a graceful lantern, covered also with zinc plates and scales, the whole being finished by a figure grasping a flag-staff in the right hand. This figure is a beautiful example of zinc modelling, and is the work of a well-known Dutch artificer, Mr. Braat, of Delft.

Having in view the clumsy work executed in South Africa generally (not from want of skill, but want of machinery), the gutters and other zinc-work have been made in Europe.

The design is Greek in proportion and detail, but the addition of the dome and arched openings lend a Græco-Roman feeling to the ensemble. Great care has been taken that the proportion of the mouldings and other details shall be in accordance with the best traditions, and it may be noted that the cast for the caps to the columns has been modelled from an example taken from the ancient temple dedicated to Jupiter Olympus, now in the Greek Gallery at the British Museum.

As to the interior of the Raadzaal, the ceiling consists of a broad cove all round, the centre portion being slightly arched; over the deputies' seats, or the table of the House, an elliptical cupola is placed, for additional light and ventilation. The entire ceiling is boldly panelled, and enriched ribs spring from the pilasters against the flank walls; the panels are heavily moulded, and relieved with egg-and-tongue enrichments. At the springing of the cove is a bold cornice frieze and architrave with enriched dentils and foliated pateras. The ceiling and cornice is of fibrous plaster, a beautiful material capable of almost any development.

The pilasters supporting the entablature (or cornice) are of fibrous plaster, having fluted shafts, moulded bases and foliated caps, the latter after a celebrated example. The gallery front and ceiling is of plaster, supported by bold and richly-ornamented consoles. It is not intended for the use of the general public, but may be used as a musicians' gallery, or placed at the disposal of distinguished visitors. The entrances to the chamber are nine in all, an ample number for a room which would accommodate, if all the space was occupied, allowing 8 feet superficial to each unit, 622 persons. There are three entrances from the lobby. The central lobby under the dome has a plaster domed panelled and moulded ceiling, with a top light of stained-glass, and an enriched cornice; the side lobbies have groined, panelled and moulded ceilings, with enriched cornices round. The paving to the lobbies is of Devonshire marble. The walls of the lobbies and Raadzaal are to be plastered in the finest Parian cement, a perfectly pure white substance of fine texture and hardness, and this portion of the work will be painted in stippled colours throughout. The question of the use of cements in a dessicated climate is a vexed one. Portland cement does not lend itself to fine internal work; local lime burnt by rude methods is next to useless; daggar is on many counts detestable. Many experiments have been tried with the fine cements, such as Robinson's, Keene's and Parian, for durable work, and the result shows that a ground coat of good Portland finished with any of the fine white cements above-named is the very best formula for work of this class in dry climates.

The floor of the Raadzaal will be of light Stettin oak, polished on the surface. This work is made in England, and is framed in sections of about 6 feet square of well seasoned oak, pre-

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WOOLPITS, SURREY. FOR SIR HENRY DOULTON BY ERNEST GEORGE AND PETO.
PROOFS of this Illustration, which appeared in "The Architect" on June 6, 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each; post free, on roller, Ninepence.
P. A. GILBERT WOOD, 175 Strand, London.

pared to be ready for laying on arrival direct to the under timbers. The whole of this work had been completed when a fire occurred at the manufactory, and the whole was destroyed. The loss, however, was covered by an ample insurance. The corridors as well as the colonnades, anterooms and porticos, are to be laid with encaustic tiles. All the wall-papers have been specially printed by Messrs. Jeffreys, of Essex Road, Islington, London.

The Raadzaal is to be heated with hot-water radiators from a special apparatus provided for the purpose, capable of supplying a maximum heat of 60 deg. upon the external register.

Special care has been exercised in providing sufficient ventilation for the Raadzaal, smoking-room, &c., upon the improved principle of automatic exhaust air-pumps. The external windows are all to be fitted with plate-glass except those in the Raadzaal, which are of painted cathedral glass emblazoned with the arms of the State.

Ample sanitary offices are to be erected at the east end of the site upon a—for here—improved principle. The site is to be enclosed with a dwarf stone wall and an ornamental iron railing. At the entrance carriage gates will be arranged a side gate for pedestrians. There will be a lodge attached thereto of simple design.

Unfortunately the levels of the site are contrary to good effect, but a terrace is to be made all round the building, 30 feet on each side, perfectly level, gravelled up to the lowest step leading to the porticos.

The whole of the movable furniture, mantelpieces, overmantels and over-doors will be manufactured from special designs prepared by the architect to harmonise with the design of the building.

The interior of the Raadzaal is now in an advanced state, and it is hoped that the structure will be ready for occupation for the sitting of the Assembly in May 1892.

Especial care has been taken with the importations. The firms who supplied goods are :—Messrs. Hill & Son, 100 Queen Victoria Street, locks and ironmongery ; Messrs. Walter Macfarlane & Co., of Glasgow, castings ; Messrs. Braby & Co., Euston Road, Mr. Braat, of Delft, Holland, and Messrs. Holden & Co., 5 Wood Street, Westminster, zincwork ; The Plastic Decoration Company, 21 Wellington Street, Strand, fibrous plaster ; Messrs. Hindley & Co., Oxford Street, parquet flooring ; Mr. Edwin Horwood, Frome, painted glass ; Messrs. J. & E. Goad, Plymouth, marble paving ; Mr. Curtis, Shepherd's Bush, marble mosaic pavement ; Messrs. Cohen & Co., Curtain Road, London, mantelpieces ; Messrs. Kite & Co., Chalton Street, ventilators ; Messrs. Woolliscroft & Sons, Hanley, Staffs., encaustic tiling ; Messrs. Jeffreys & Co., Essex Road, Islington, wall-papers ; Messrs. Cafferata & Co., Carlisle, Parian cement ; Messrs. Macdonald, Aberdeen, polished granite steps ; Messrs. Edgcumbe, Rendle & Co., Westminster, cupola lights, and Messrs. Rosser & Russell, Charing Cross, the heating apparatus. Nearly all the goods above enumerated are now delivered upon the site ready for fixing *in situ*.

The late contractor, Mr. Thomas R. Robertson, executed the work during the tenure of the contract in a perfectly satisfactory manner, as also Messrs. Heimann, who since assumed control of the works.

Mr. Collingwood Tully is officer in charge, and much of the present progress of the work is due to his untiring efforts. Mr. A. Wocke, clerk of works, has rendered valuable assistance from the first.

DILAPIDATION IN AN ARCHITECT'S HOUSE.

IN the Queen's Bench Division of the Irish Court, Mr. J. L. Robinson, architect, sued Dr. Edward Kennedy, the Collector-General of Rates, in respect of alleged dilapidation of a house at Cultra, Glenageary. The plaintiff sought to recover 60*l.* 19*s.* 6*d.* in respect of alleged breach of contract to keep in good order and repair the house known as Cultra, Glenageary, held by the defendant from the plaintiff. The plaintiff stated that the defendant in April 1886 became tenant of the house and premises known as Cultra, Glenageary, for three years, at a yearly rent of 145*l.*, from June 1, 1886, on the terms that the defendant should keep the house in good order and condition, and deliver it up in good repair at the end of the term, and that the defendant did not carry out the terms of this agreement. Mr. Robinson was examined, and deposed to dilapidations which he alleged were made in the house. The defendant denied the dilapidations, and said he delivered up the house in the same condition as that in which it had been when he got it, allowing for reasonable wear and tear. Lest he should be under any liability to the plaintiff, the defendant brought 10*l.* into court as sufficient to satisfy the plaintiff's claim in respect of the matters alleged.

Mr. Long, builder, gave evidence that the injuries were not caused by reasonable wear and tear.

The defendant said he called Mr. Robinson's attention to defects in the plastering in the house. He also stated that the

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bedding of the tiles was imperfect. He went through the other items, and denied that any injuries had been done, except what arose from reasonable use of the premises.

Mr. Murray, architect and engineer, stated that there was no injury to the housework of the house.

The jury found for the plaintiff for 2*l.* 10*s.* over the 10*l.* lodged in court.

THE ONCKEN STAVELESS BARRELS.

THERE is now on exhibition at 48 Queen Victoria Street, E.C., some specimens of the Oncken staveless barrels, which have been inspected and approved by large numbers of parties interested in the subject, and a limited company is about to be launched for taking over the concern and working it on a very large scale. The Oncken machine unrolls, so to speak, the logs of poplar, oak, elm or other wood treated by it, by reducing the same to one long strip or veneer of the requisite thickness. The sheet of wood so obtained is then cut into suitable lengths for making such barrels as may be required. By a second process, the sheets of wood are cut at the extremities into a number of grooves, so that they can be bent into barrel form. Some other manipulation takes place, and then the barrels are ready to have the hoops driven on, after which the process is completed, and there is presented a finished article which answers the purpose admirably, at a cost which, it is claimed, must be considerably less than by any other process hitherto employed.

JARMAN'S ELECTRIC MOTOR.

A SATISFACTORY trial was recently made of a tramcar propelled by Mr. Alfred Jarman's electric motor on the Croydon Tramways, in the presence of Major-General Hutchinson and Major Cardew, the Board of Trade inspectors, and a number of local notabilities. The motor is low-speed (650 a minute), and capable under ordinary circumstances of running at the rate of eight miles an hour, which could, however, be doubled, if necessary. The car is fitted with two of these motors, which are of 7 horse-power nominal each, but the pressure can be increased to 14 horse-power with safety, it is claimed. The cells are placed under the seats, and it is claimed that the car can be run thirty miles with one charging. It is lighted by four lamps of 16 candle-power each, which derive their energy from the same source as the motor. The Electric Tramcar Syndicate are said to be under a contract with the Croydon Tramways Company to run these cars in Croydon, and a commencement is expected to be made in the course of another fortnight. The result will be watched with interest.

BEDDINGTON PARK ESTATE, MITCHAM.

IT is a matter of surprise and wonderment that the general body of investors should be so disinclined or hesistant in the matter of purchasing land, considering that property of this character may usually be regarded as absolutely secure, with the contingency generally of increasing in value, for although riches, we are told on good authority, certainly take unto themselves wings, as many have experienced, yet land is so entirely dissociated from anything of a portable character, that it may be regarded as one of the most permanent possessions existing in this sublunary sphere. Complaints are rife that the land is held for the most part by a privileged few, but there is no reason why the number of small landowners in this country should not be increased to an almost indefinite extent, for all the facilities, along with inducements for so doing advantageously, are to be found by diligent search ; but it seems that things which are a long way off have more attraction for the majority of people, who are apt to put their money in concerns that are speculative and more or less shadowy, with the result too often that experience of a costly kind is gained.

London, with its immense and ever-increasing population, has still much need, vast as it is, to spread itself out more and more ; fortunately opportunity for so doing is still afforded, owing to the vacant areas of land to be found within a reasonable distance of the City, and it is on the southside particularly that this relief for a congested population is tobe obtained, for not only does great natural beauty and fertility attach to the county of Surrey, as well as other advantages, but the means of communication are rapid, thanks to the network of railways existing and the quick service of trains.

In connection with this subject, which is one of perennial interest to architects and builders and the public generally, we had the opportunity a few days ago of inspecting a little estate of about twenty acres between, and within a short walking distance of, Hackbridge and Mitcham Junction stations, which latter can be reached by train from either Victoria or London Bridge in

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Solid 1-inch Oak, straight boards, laid and polished, at £6 18*s.* a square.

Solid ¼-inch Oak Parquet for covering Deal Floors, laid and polished, from £5 a square.
Oak Wood Tapestry Dadoes, from 1*s.* per foot super.
Walnut or Mahogany, from 1*s.* 3*d.* per foot super.
Ditto, with Heavy Mouldings, 4*d.* foot extra.
Ditto, ditto, with Carved or Painted Panels, prices according to sketches.

Prices given for all Interior Work, Doors, Architraves, Over-doors, Chimney-pieces, Stoves, and Hearths.
Architects' and Surveyors' attention particularly called to the above quotations for

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about twenty minutes. The property referred to is on the high road to Carshalton and Sutton (which are adjacent), and onward to Epsom and Leatherhead. Wallington also is near to, while the large and important borough of Croydon is accessible in a few minutes. The river Wandle—or stream rather—is in close vicinity, and the surrounding scenery is of a pleasant character, while the air is pure and health-giving. The estate is laid out in a number of well-arranged roads, properly and soundly constructed. Evidently it is well-adapted for building purposes, as the subsoil is gravel, with a rich loam on the surface, rendering it adaptable also for garden cultivation. The whole has been well drained, under the supervision of the Surveyor to the Rural Sanitary Board, who also superintended the construction of the roadways. The sewage system appears to be faultless, the outfall being into the main drain below the highway facing the property. Water is also laid on by the Sutton District Water Company, who furnish an abundant supply as and when required, so that those who purchase plots incur no outlay in respect of either sewage or water, which is an important consideration. There is likewise said to be a great demand for houses and cottages in the neighbourhood, several of which have already been built on the estate, and we are informed that quite a number of purchasers of plots have signified their intention to build in the early part of the new year.

It may be added that the prices of the plots, which are free of tithes and land-tax, range from as low as 25*l.* upwards, and there is no charge for conveyance, while the terms of payment are extremely easy, for only 5 per cent. of the purchase-money is required by way of deposit, and the balance is spread over three, five or ten years, no interest being charged the first year, but afterwards 5 per cent. on the unpaid balances. Possession of the land can be had immediately, and there are no vexatious restrictions, nor is building made compulsory. It is significant that the owner of the estate, Mr. Walter Allnutt, lives there, and it is noteworthy that he expresses his readiness to render purchasers of plots every assistance in building a house, although they can choose their own plan and builder if they so elect. All that is stipulated for is a small deposit, proportionate to the cost of both land and proposed house, then the matter is carried through speedily, without further money being required until completion of the building, so that any member of a building society can get a house erected cheaply to his taste, and those who are not actually such members may readily from the same source obtain the requisite means to pay for the house when finished.

It will thus be seen that the acquisition of a plot of land, with a house built thereon if needed, in a rural locality is within the reach of even those who have but slender means, while the tendency of living a few miles out of, rather than in London, is deserving of encouragement on both moral and hygienic grounds.

PATENTS.

[*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*]

APPLICATIONS FOR PATENTS.

20806. Arthur Illidge, for "Improvements in or relating to sash fasteners."

20821. Henry Thomas Johnson, for "Improvements in valve ventilators."

20822. William Bracewell, for "Improvements in means or appliances for ventilating and supplying moistened air in weaving and spinning factories and other enclosures."

20834. Loftus Balfour Moreton, William Oakley and John Stokes, for "Improvements in padlocks and other locks."

20894. Henry Bernouilli Barlow, for "An improved nut lock."

20921. William Browne Parker, for "Improvements in safety hooks for the cages of lifts and hoists and for other purposes."

20973. Owen Willmer White and James Painter Williams, for "Improvements in fastenings for doors, gates and the like."

21004. Henry Humphries Cribb, for "An improved mode of preparing, fitting and laying blocks for floors, walls, or ceilings of wood or other material."

21024. William Wright, for "An improved method for hanging window sashes."

21085. Arthur Patschke and Wilhelm Eichner, for "Improvements in mounting and arranging drawing-boards and in appliances in connection therewith."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.

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38 BROAD STREET, GOLDEN SQUARE, W.
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HENRY KING
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Lower Seymour St., Portman Sq., W.
Late of 100 NEW BOND STREET).
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GOLD MEDAL, PARIS EXHIBITION, 1889.

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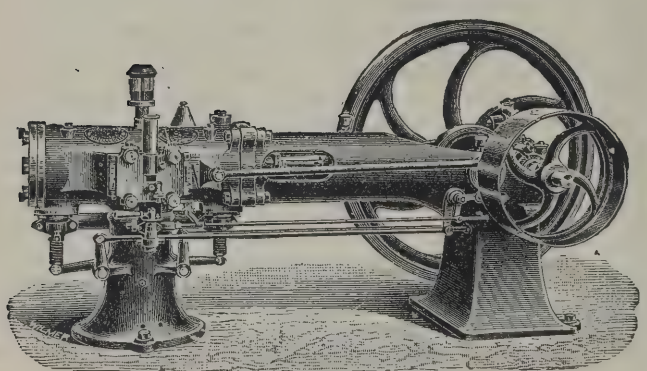
THE

"GRIFFIN" GAS ENGINE.

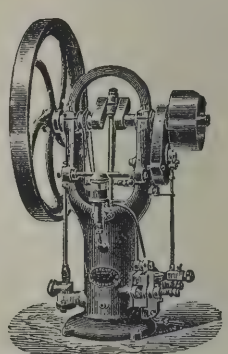
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And Professor KENNEDY, F.R.S., M.I.C.E., University College, London:—

"There is no doubt that it is a most important practical advantage of the 'Griffin' type of Engine, that it can be made to accommodate itself to variations of resistance not only without alteration of mean speed, but also without alteration in the number of explosions per minute, and therefore, without any alteration of steadiness."

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Friday, December 18, 1891.

A Business Supplement

The Contract Reporter.

to The Architect.

LONDON, DECEMBER 25, 1891.

COMPETITIONS OPEN.

DARWEN.—Feb. 15.—Designs are Invited for a Building with Accommodation for Technical Instruction on Ground-floor, Public Library on Second Floor and Science and Art Classes on Third. Premiums of 50*l.*, 25*l.* and 10*l.* Mr. Charles Costeker, Town Clerk, Darwen.

HOLMFIRTH.—Jan. 15.—Plans are Invited for a Technical School at Lower Bridge. Premiums of 15*l.*, 10*l.* and 5*l.* Mr. H. Lomax, Local Board Offices, Holmfirth.

PENRITH.—March 8.—Designs, &c., are invited for the Erection of Board School. Mr. C. N. Arnison, Clerk to the School Board, Penrith.

CONTRACTS OPEN.

ABERAFON.—Jan. 9.—For Alterations and Improvements to Police Station. Mr. T. Mansel Franklen, Cierk of the County Council, Cardiff.

ALLOA.—Dec. 31.—For Construction of Gasholder and Gasholder Tank. Mr. Alex. Yuill, Manager.

ASHTON-UNDER-LYNE.—Dec. 29.—For Supply of Cast-iron Pipes (43 tons), 45 inch diameter, and Cast-iron Collars. Mr. G. H. Hill, Engineer, Albert Chambers, Albert Square, Manchester.

BANFF.—Dec. 25.—For Works in Building Bank Office and Agent's House. Messrs. Wm. Henderson & Son, Architects, 124 Union Street, Aberdeen.

BATH.—Jan. 1.—For Alterations to Wesleyan Chapel and Lecture-hall, Walcot. Mr. Alfred Long, Architect, High Street, West Bromwich.

BODIAM.—Dec. 31.—For Rebuilding Bodiam and Hammerditch Bridges. Mr. Henry Card, County Surveyor, Lewes.

BRIGHTON.—Jan. 7.—For Strengthening Pier-head and Construction of Pavilion with Verandah, Gallery, Stage, Dome and Promenade Roof. Mr. R. W. Perigrine Birch, Engineer, 5 Queen Anne's Gate, Westminster.

BRISTOL.—Jan. 14.—For Construction of Floating Pontoon Dock (365 feet long by 85 feet wide). Mr. J. McCurrich, Engineer, Cumberland Basin, Bristol.

BUCKINGHAM.—Jan. 5.—For Sinking Trial Shafts for Proposed Waterworks. Mr. Baldwin Latham, Engineer, 13 Victoria Street, Westminster.

CALNE.—Jan. 11.—For Building House for Mr. Tom Harris. Mr. Charles E. Davis, F.S.A., 55 Great Pulteney Street, Bath. Quantities by Mr. A. Amor, Octagon Chambers, Bath.

CARMARTHEN.—Dec. 28.—For Building Infant School and Alterations to Pentrepoth School.

CROYDON.—Jan. 26.—For Pumping Engine, Pumps and Steam Boilers, for Addington Waterworks. Mr. T. Walker, Borough Engineer, 8 Katherine Street, Croydon.

DENBY.—Jan. 7.—For Construction of Service Reservoirs, Laying Pipes and Works in connection. Messrs. G. & G. H. Crowther, C.E., 38 New Street, Huddersfield.

DERBY.—Jan. 1.—For Boundary Walls, Entrance Gates and Railings, Rowditch Recreation Ground. Mr. R. J. Harrison, Borough Engineer, Derby.

DEVONPORT.—Jan. 4.—For Drainage of the Deadlake. Mr. J. L. Hodge, Surveyor, 22 Courtenay Street, Plymouth.

DUBLIN.—Jan. 1.—For Alterations to Mansion, Athgoe Park, Hazelhatch. Mr. Wm. H. Byrne, Architect, 20 Suffolk Street, Dublin.

EDINBURGH.—Dec. 30.—For Construction of Lighthouse Tower, Ron Rock, off Rattray Head, and Dwellings for Three Keepers on Rattray Head, for the Commissioners of Northern Lighthouses. Mr. David A. Stevenson, Engineer to the Board, 84 George Street, Edinburgh.

FAREHAM.—Dec. 31.—For Providing and Laying an Extension of Water-main Hydrants, &c. Mr. L. Warner, Clerk, Local Board Offices, Quay Street, Fareham.

GARSTON.—Jan. 4.—For Building Fever Wards adjoining Infectious Diseases Hospital. Mr. Henry T. Wakelam, Engineer, Public Offices, Garston Old Road, Grassendale.

GLASGOW.—Dec. 29.—For Building Fire Engine Station. Mr. J. Lang, City Chambers, Glasgow.

GLASGOW.—Jan. 12.—For Construction of Two Tunnels of 11 feet Internal Diameter, partly of Iron and partly of Brickwork, for the Glasgow District Subway Company. Messrs. Simpson & Wilson, Engineers, 175 Hope Street, Glasgow.

GLASGOW.—Jan. 18.—For Building of a Stone Bridge over the River Clyde. Messrs. Crouch & Hogg, Engineers, 175 Hope Street, Glasgow.

GREAT BERKHAMSTED.—Jan. 4.—For Building Lock-up. Mr. Urban A. Smith, County Surveyor, Victoria Mansions, 28 Victoria Street, Westminster, S.W.

HALIFAX.—Jan. 2.—For Building Shop Premises. Messrs. G. Buckley & Son, Architects, Tower Chambers, Halifax.

HALIFAX.—Jan. 9.—For Building Workshop, Kingston. Mr. J. Farrar, Architect, 29 Northgate, Halifax.

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HALIFAX.—Jan. 30.—For Building Store and Six Houses. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HAMSTERLEY.—Dec. 31.—For Building Mission Chapel. Messrs. Hicks & Charlewood, Architects, 42 Grainger Street, Newcastle-on-Tyne.

INNELLAN.—Jan. 13.—For Construction of Reservoir, &c. Mr. James Wilson, Engineer, Municipal Buildings, Greenock.

IPSWICH.—Jan. 5.—For Building Additional Classrooms for Technical Instruction to Science and Art Schools. Mr. H. Miller, jun., C.E., Exchange Chambers, Ipswich.

KENSINGTON.—Jan. 14.—For Building Administrative Block and Three Pavilions for Patients at Infirmary, Marloes Road, for the Guardians. Mr. T. W. Aldwinckle, Architect, 1 Victoria Street, Westminster, S.W.

KING'S LYNN.—Jan. 10.—For Construction of Large Sheds, Bentinck Dock. The Secretary, Anglo-Belgian Steamship Company's Offices, Market Place, King's Lynn.

KIRKHAM.—Dec. 29.—For Construction of Sanitary Pipe Sewers (3¼ miles), with Settling Tanks. Mr. A. M. Fowler, Engineer, 1 St. Peter's Square, Manchester.

LEEDS.—Dec. 31.—For Alteration of Houses and Warehouses, Building Shops, Offices, &c. Messrs. J. Charles & Sons, Architects, 98 Albion Street, Leeds.

LEICESTER.—For Building Warehouses and Shops, High Street. Mr. B. Tomlinson, Architect, 11 Martineau Street, Birmingham.

LEWISHAM.—Jan. 14.—For Building Infirmary. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

LIVERPOOL.—Jan. 6.—For Building Workhouse Infirmary, &c. Messrs. C. O. Ellison & Son, Architects, 22 St. Thomas's Buildings, Liverpool.

LLANDEBIE.—Jan. 12.—For Additions and Alterations at Board Schools, Cross Inn, Ammanford and Drefach. Mr. David Jenkins, Architect, Llandilo.

LONGFLEET.—Jan. 12.—For Additions, &c., to Union House and Buildings. Mr. H. F. J. Barnes, Architect, Towngate Street, Poole.

MARKET DRAYTON.—Jan. 16.—For Adding Two Classrooms, Closets and Fence Walls to National Schools. Mr. H. Jones, Corbet Estate Office, Market Drayton.

MIDDLESBROUGH.—Jan. 29.—For Works in Connection with Reconstruction of North and South Shore Cart Ferry Landings, Middlesbrough and Port Clarence; Construction of Two Bowstring Girder Bridges of mild Siemens Steel (each 150 feet span by 18 feet clear width), with Platforms of Timber, &c., together with Cast Metal Carriages and Standards, Wrought-iron Railings, &c.; Execution of Piling and Timberwork; Concrete, Brick and Stonework; Alteration and Reconstruction of Embankments, Roads, Fences, Buildings, &c. Mr. E. D. Latham, Borough Engineer, Middlesbrough.

MITCHELSTOWN.—Jan. 14.—For Construction of Waterworks, Reservoir and Distributing Pipes, &c., for the Guardians of Mitchelstown Union. Mr. Richard Fitzgibbon, Clerk, Board-room, Mitchelstown, Ireland.

NAIRN.—Dec. 28.—For Extending East Pier of Harbour by Sheet Piling and Concrete Work. Mr. W. Smith, Engineer, Harbour Buildings, Aberdeen.

NEWCASTLE-ON-TYNE.—Jan. 2.—For Reconstruction of Bridge of about 1,000 feet Span over the River Till, near Hedgeley Station; Demolition of present Bridge, Building new Abutments and Walls, Supply and Erection of about 70 tons of Iron Girders, and Platform. The County Surveyor, Moot Hall, Newcastle-on-Tyne.

NEW MILLS.—Jan. 2.—For Building Two Houses. Mr. W. Swinden Barber, Architect, 28 George Street, Halifax.

PENZANCE.—Dec. 28.—For Building Mission Church and Vestries at Hea Moor. Mr. H. White, Architect, 1 Parade Passage, Penzance.

PONTARDAWE.—Dec. 31.—For Widening Bridge. Mr. T. Mansel Franklen, Clerk to the County Council, Cardiff.

READING.—Dec. 29.—For Building Workshops, Stores, Boundary Walls, &c., and Construction of Iron Roof, 84 Feet by 60 Feet. Mr. Arthur E. Collins, Borough Engineer, Town Hall, Reading.

ROMFORD.—Jan. 2.—For Supplying Lancashire Boiler with Galloway Tubes, for Sewage Farm, Hornchurch. Mr. A. H. Hunt, Clerk to the Local Board, South Street, Romford.

ROMFORD.—Jan. 8.—For Building Police Station. Mr. H. Stock, County Surveyor, 9 Denman Street, London Bridge, S.E.

RUABON.—Jan. 1.—For Building Policeman's House, Upper Ponkey. Major T. J. Leadbetter, County Buildings, Wrexham.

SANDWICH.—Jan. 12.—For Supply of one ½-h.p. vertical Otto Gas Engine, with Water Tank and Flywheel and 9-inch Pulley attached; one 2,000 cubic feet per hour Beale's Gas Exhauster,

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with 9-inch Pulley attached; two 3-inch disc-flanged Valves; one 3-inch self-acting by-pass flanged Valve; one 15-inch Gas Governor and flanged Throttle-valve; 8 feet 2 inches of Shafting; three 2-inch Plummer Blocks fitted to Shafting; and two 15-inch Pulleys fitted to Shafting, for the Gas Company. Mr. Joseph Latchford, Manager, Sandwich.

STAFFORD.—Jan. 4.—For Steel Girders, Wrought-iron Plates and Cast-iron Columns, to form Floor for New Retort-house, for the Gas Committee. Mr. J. F. Bell, Engineer, Gas Works, Stafford.

STAFFORD.—Jan. 4.—For Four Purifiers, each 20 feet by 25 feet by 6 feet deep, along with Central Valve and Connections, and Two Hydraulic Travellers for lifting Purifier Covers. Mr. J. F. Bell, Engineer, Gas Works, Stafford.

STAFFORD.—Jan. 4.—For Wrought-iron Lattice and Warren Girders, Steel-rolled Joists, Roof Principals, Cast-iron Columns, &c., for new Purifying Sheds. Mr. J. F. Bell, Engineer, Gas Works, Stafford.

STAINCLIFFE.—Jan. 1.—For Heating Infirmary and Workhouse. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

SWADLINCOTE.—Jan. 7.—For Construction of a Two-lift Telescopic Gasholder to Hold 90,000 Cubic Feet of Gas. The Manager, Gasworks, Swadlincote.

TONYPANDY.—Dec. 29.—For Alterations and Additions to Co-operative Society's Premises. Mr. R. S. Griffiths, Architect, Excelsior Buildings, Tonypandy.

WARWICK.—Jan. 14.—For 3,700 yards of Iron Pipes with Hydrants and Fittings, &c., and Constructing Reservoir. Mr. E. Melville Richards, Engineer, The Butts, Warwick.

WEST BROMWICH.—Jan. 7.—Tenders, with Drawings and Specifications, for Construction of a Two-lift Gasholder, 120 Feet Diameter, at Gasworks, Albion, West Bromwich. Mr. Wm. Littlewood, manager.

WOOLWICH.—Dec. 31.—For Erection of Quarters for Twenty Gentlemen Cadets at Royal Military Academy. The Royal Engineer Office, Mill Lane, Woolwich.

WROOT, LINCOLNSHIRE.—Jan. 15.—For Erecting at the South Level Pumping-station Two complete Sets of Centrifugal Pumping Machinery, including Engines and Boilers, capable of lifting 100 tons of water per minute each, for the Corporation of the Level of Hatfield Chase. Messrs. Baxter & Co., Solicitors, Doncaster.

TENDERS.

ABERDEEN.

For Alterations on Property, Nos. 101 to 105 George Street, Aberdeen, for Mr. John Croll. Messrs. ELLIS & WILSON, Architects, 181A Union Street, Aberdeen. Quantities by Architects.

Pringle & Slessor, mason.
J. Henderson, carpenter.
G. Currie, slater.
Scott & Sellar, plasterer.
J. F. Anderson, plumber.
J. Mason & Son, painter.

ALNWICK.

For Construction of Service Reservoir, Hauxley and Togston, Northumberland, and over Eight Miles of 4-inch and 3-inch Cast-iron Pipes, for the Alnwick Union R.S.A. Mr. M. TEMPLE WILSON, Surveyor, Alnwick.

J. Grantham, Blyth	£3,838 0 0
J. M. Pearson, Kilmarnock	3,818 0 0
G. Thompson, Alnwick	3,763 0 0
T. Dixon, Houghton-le-Spring	3,502 0 0
Elliott & Nicholson, Gateshead-on-Tyne	3,364 15 9
R. Yeaman, Felton	3,333 0 0
R. Carse & Son, Acklington	3,225 0 0
D. MacGregor, Belford	3,046 6 6
T. Bell, Market Weighton	2,999 9 9
J. CARRICK, Durham (*accepted*)	2,876 0 0
W. McLaren & Son, Chathill	2,347 0 0

BARNSLEY.

For Main Sewers at Dodworth, near Barnsley, for the Dodworth Local Board. Messrs. WADE & TURNER, Engineers, Barnsley.

R. Robinson, Dodworth	£3,500 0 0
H. Barrows & Sons, Barnsley	3,144 9 9
J. W. Fisher, Castleford	2,958 16 8
J. Cooper, Barnsley	2,799 10 0
M. Hall, Bradford	2,744 2 3
J. Bentley, Leicester	2,661 0 0
G. Pearson, Cleckheaton	2,569 0 0
Higham & Porter, Barnsley	2,563 0 0
PARKINSON & BOWER, Halifax (*accepted*)	2,560 0 0

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For the Blackpool Eiffel Tower, to be Erected in Steel, approximate weight 1,500 tons, in addition to the Staircases, Gates and Flagstaff as specified. Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester.

HEENAN & FROUDE, Newton Heath, Manchester (*accepted*)	£40,500 0 0

BRISTOL.

For Construction of Culvert, and Works to prevent Flooding from the Malago River at Bedminster.

DURNFORD & SON, (*accepted*)	£18,000 0 0

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BROMLEY.

For Erection of a Shop in High Street, Bromley, Kent, for Mr. D. Lavender. Mr. G. WARREN COOPER, F.S.I., Architect. Quantities by Mr. A. R. Brede.

J. C. ARNAUD & SONS, Bromley (*accepted*)	£1,562 0 0

CHATHAM.

For Erection of Engine-room and Other Works, for the Electric Lighting Company, Chatham. Mr. E. W. BETTS, Architect, Chatham. Quantities not supplied.

W. C. Snow, New Brompton	£1,300 0 0
W. Hocking, Strood	1,240 0 0
G. Batchelor, Strood	1,237 0 0

CUCKFIELD.

For Drainage Works, Cuckfield.

Botterill	£8,169 0 0
Bentley	8,034 0 0
Meare	6,947 0 0
Ellis	6,803 0 0
Weston	6,177 0 0
Lloyd	5,756 0 0
Cooke	5,732 0 0
Shie	5,549 0 0
Osenton	5,544 0 0
Kavanagh	5,506 0 0
SAUNDERS (*accepted*)	5,368 0 0
Hall	5,311 0 0
Shaw	5,030 0 0
Perrin & Long (*withdrawn*)	4,605 0 0

GALMPTON.

For Additions to Greenway House, Galmpton, South Devon, for Mr. T. B. Bolitho, M.P. Messrs. J. W. ROWELL & SON, Architects, Newton Abbot.

Vanstone & Mumford, Torquay	£950 0 0
C. & R. E. Drew, Paignton	945 0 0
F. A. Stacey, Newton Abbot	935 0 0
Rundle Bros., Kingsbridge	926 0 0
Wm. Mills, Newton Abbot	910 0 0
RABBICH & BROWN, Paignton (*accepted*)	897 0 0

GOOLE.

For Works for the Goole Fields Drainage Board. Mr. W. H. WHEELER, C.E., Engineer, Market Place, Boston, Lincolnshire.

G. Walker, Leeds	£2,723 10 0
B. Graham, Huddersfield	1,842 0 0
J. Simpson, Leeds	1,622 0 0
J. Band, Wisbech	1,622 0 0
J. BURRELL, Wyberton (*accepted*)	963 10 0

LUTON.

For Alterations, for Messrs. Arnold & Co., Luton. Mr. A. E. SMITH, Architect.

G. Kingham	£813 10 0
J. Neville	775 0 0
J. Long	774 0 0
G. Pryce	724 0 0
G. Smart	720 0 0
J. Saunders	707 14 0
D. Parkins	627 0 0

MANSFIELD.

For Building House, St. John Street, Exclusive of Party Wall, for Mr. G. H. Munks. Mr. R. FRANK VALLANCE, F.R.I.B.A., Architect. Quantities by Architect.

S. & G. FRISBY, Mansfield (*accepted*)	£850 0 0

Three tenders received.

For Alterations to Charter Arms, for Messrs. Hole & Co., Limited. Mr. R. FRANK VALLANCE, F.R.I.B.A., Architect.

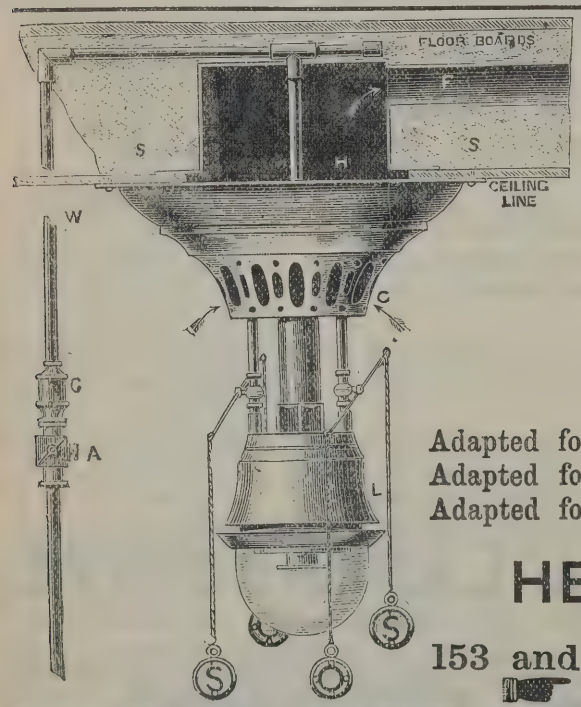
Jno. Greenwood, Mansfield	£540 0 0
W. A. Vallance, Mansfield	490 0 0
Geo. Bradder, Mansfield	458 0 0
S. & G. Frisby, Mansfield	453 0 0

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NEWPORT.

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H. C. Parfitt	£660	0	0
J. D. Parfitt	630	0	0
S. SMALL (*accepted*)	595	0	0

ONLLWYN.

For Erection of a new Schoolhouse and Offices, Onllwyn, South Wales, for the Dylais Higher School Board. Mr. PHILIP WILLIAMS, Architect, Ystradgynlais, Swansea Valley.

Evan Thomas, Seven Sisters, Neath	£450	0	0
Richard Thomas, Caerlan, Abercrave, Swansea Valley	416	0	0
JOHN THOMAS, Sunny Bank, Crynant, Neath (*accepted*)	405	19	0

PLYMOUTH.

For Rebuilding Tenement of Nos. 29 and 30 Kinterbury Street, Plymouth, for Mr. E. Doyle. Mr. JAMES HARVEY, M.S.A., Architect, Bedford Street, Plymouth.

J. Foot	£250	0	0
A. Andrews	240	0	0
A. N. Coles	210	0	0
W. H. Palmer	191	0	0
W. T. Bone	190	0	0
T. A. PEARN & SONS (*accepted*)	179	0	0

ROCHESTER.

For Construction of Engine-house, Boiler-house, Engine Foundations and Other Works at the Waterworks, Strood Hill, for the Corporation of the City of Rochester. Mr. WM. BANKS, City Surveyor.

W. Neil, Bow	£1,208	0	0
M. O. J. Robson, London	1,058	0	0
F. Stevens, East Grinstead	1,055	10	0
G. Munday & Son, London (*informal*)	1,028	0	0
H. Somerford, Clapham	999	0	0
J. M. Patrick, Chatham	990	0	0
G. E. Wallis & Sons, Maidstone	984	0	0
L. Seager, Sittingbourne	969	0	0
J. G. Naylar & Son, Rochester	966	0	0
M. E. FENTON, Strood (*accepted*)	885	0	0

A PARSEE FIRE TEMPLE.

THE Bombay papers contain accounts of the consecration there recently of a new temple erected for the reinstatement of the sacred Adaran fire. The fire was installed in 1733 by Manockjee Nowrojee Shett. The old building showing signs of decay it was replaced by a new one at a cost of about a lac of rupees by Mr. Jalbhoy Ardeseer, the eighth lineal descendant of the founder. It is built in the ancient Persian style of architecture. A flame, before it falls into one of the three recognised classes of Parsee sacred fires in India, has to undergo certain ceremonials corresponding to the dignity of the order to which it is destined to belong. Thus, only a thirtieth part roughly of the expenditure and religious recitation would be required to consecrate a Dadgan fire than when a Beheram fire is intended to be installed. The most ancient fire at present in India is at the secluded village of Oodwada, near Bulsar, and the Parsees make it a point to repair to the Beheram fire there in large numbers during the months which are specially allotted to the presiding genius of fire. It was consecrated about twelve centuries ago by the ancestors of the present Parsees in commemoration of the voyage they had in their emigration from Persia to India. The priests vowed to institute the fire in the event of their ships landing them in safety on Indian soil. The fire is fed, at five stated times during each twenty-four hours, with sandal-wood, benzoine and quantities of other odorous materials, as well as with very dry fuel. This, however, cannot be done without previous compliance with certain religious formulas. Next in rank to the Beheram fire is the Adaran, the one reinstated recently in Bombay. It is placed in a large silver censer, estimated to have cost about 7,000 rupees. The hall in which it is placed could not be entered except by the officiating priest or his immediate assistant. While the building was under construction the Adaran fire was removed to a place set apart for the purpose and for the use of the priests in charge. All the arrangements for the removal and reinstatement to the new temple were made under the directions of the hereditary priest officiating in the temple. After the ceremony was over, one of the priests read, on behalf of the priestly community making use of the fire-temple, an address of congratulation to Mr. Jalbhoy Ardeseer, and presented him with a flower vase as a memento of the occasion. The majority of the Parsees then adjourned to partake of the "chasnee," which meant the tasting of sacred wine, fruit, milk and such other edibles over which prayers had been recited.

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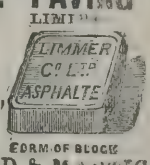
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CUTTING TOOLS.

AT the last monthly meeting of the Leeds Association of Engineers, Mr. J. C. Moorhouse read a paper on "Cutting Tools." Treating first of the material used for cutting tools, he carefully described the process of production of suitable steel, showing how the varied percentages of carbon materially affected the quality of tool steel. He also classified the qualities for various purposes. A steel containing 1½ per cent. of carbon was suitable for turning and planing, and also for drills; one with 1¼ per cent. of carbon for turning, slotting and planing, and small cutters; with 1⅛ per cent. of carbon for milling cutters, mill picks, taps, rimers, &c.; with 1 per cent. for cold chisels and shear blades; with ⅞ per cent. for forging dies, swages and fullers; and with ¾ per cent. of carbon for hammers, snaps, miners' drills, &c. There was also a steel specially produced for taps with a soft core. In the manufacture of the various tools, the smith must be carefully overlooked. It must be seen that the steel is not overheated, and care must also be taken when annealing or hardening was going on. The self-hardening steels were dealt with, and the palm for this material awarded to Messrs. Osborn & Sons, their steel bearing the name, and being manufactured under the supervision of Mr. Mushett. Other makers, however, press them very closely indeed. Mr. Moorhouse strongly advocated that all cutting tools should be ground by one man to the best recognised forms and angles, instead of their being ground by each man as he liked, the tools to be then placed in store and issued to the workmen as required. He also advised the speed of grindstones to 1,000 feet per minute. The paper was well received by the numerous auditors, and the Chairman at once commenced a discussion upon it. Mr. A. Rixson (Messrs. Woodhouse & Rixson) described at length the storage and distribution system at Messrs. Ruston, Procter & Co., Lincoln, which is on similar lines to those proposed by Mr. Moorhouse. With regard to Mushett steel, he said that there are two Mr. Mushetts, and they arrange for one of them to be present during the manufacture of their steel, which can be softened by using powdered carbon, and again restored by heating to a blood red and exposing to a cold blast. He recommended careful forging, saying the steelmaker has two enemies—one imaginary, called phosphorus, and one real, called a smith. He advised that each class of steel should be got from one man, say Mushett's for castings and rough turning, Howell's special for roughing forgings with large cuts, Hunsman's for taps, and so on. Mr. Alfred Atkinson thought the percentages of carbon named by Mr. Moorhouse were rather high. He recommended tools of heavy section, and thought the store system of distribution must pay in the long run. Mr. Lupton thought the store system did not give an apprentice an opportunity to learn how cutting tools should be ground. Mr. Thornton said he had found classifying and storing tools to answer satisfactorily. Mr. Yates objected to grindstones running at 1,000 feet per minute. Mr. Moorhouse, in his reply, thought that apprentices accustomed to correctly-ground tools would the better know how to grind them.

SILVER AND ELECTRO PLATE.

IT is an advantage for the heads of public institutions, and householders in general, to be able to obtain silver and electro-plate which will be of superior quality and of designs that will sustain scrutiny. The need has been met by Messrs. Williams & Co., of Newhall Street, Birmingham. As they are manufacturers of standing, they have advantages which are not possessed by many in the trade who have to depend on firms that are not well established for their goods. In style Messrs. Williams & Co.'s work has many advantages from the character of the designs. The articles are not likely to be affected by changes of fashion.

BUILDING AND BUILDERS.

AT the meeting of the Middlesex County Council, on the recommendation of the Finance Committee, it was agreed to carry out certain new works in the Council Chamber and Sessions House at the Guildhall, Westminster, and plans were adopted. The estimated cost is put down at 20,000*l*., and the Finance Committee were instructed to obtain tenders for the work.

IT has been decided to proceed at once with the erection of a new mission church, to be called St. Philip's, in connection with Christ Church, West Bromwich, upon a site in Beeches Road, the land having been presented for the purpose.

THE restoration of Sandringham House has been pushed rapidly forward. A new fireproof floor, measuring 60 feet by 40 feet, having iron girders and patent blocks, with 6 inches of concrete above, has been constructed in place of a similar one on the second floor damaged by the recent fire. The injured walls have been taken down and rebuilt of cement, while the

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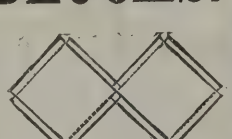
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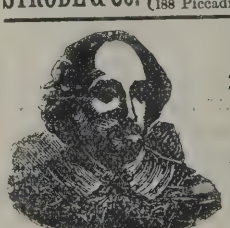
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windows have been restored with plate-glass. The fireproof floor has been constructed by Messrs. Homan & Rogers, London and Manchester.

THE contract for the Blackpool Tower has been placed in the hands of Messrs. Heenan & Froude, of Newton Heath. The erection is intended to be of steel. The height is to be 500 feet. The weight of metal will be 1,500 tons, and the contractor undertakes to complete the erection by Easter, 1893. Messrs. Neill, of Manchester, are at present engaged in pulling down the old buildings, and the excavation for the foundations will commence next week. These will be of a very massive character, each of the four foundations consisting of a solid block of Portland cement concrete, 44 feet square and 12 feet thick, with steel beams crossing and recrossing, and ponderous steel bolts, by which the foundation-plates of the tower will be anchored down to the concrete below, which rests upon a thick bed of solid boulder clay. There will be no stone intervening between the concrete and the bed-plate of the tower; but this plate will be embedded directly in the concrete, and the interior of the tower legs will be filled up for several feet with a solid mass of concrete lying above the bed-plate. In addition to this, each of the four legs of the tower—20 feet square—will be clothed with 18-inch concrete walls for a distance of 100 feet, where they will emerge above the roofs of the surrounding buildings.

AT the meeting of the Edinburgh Dean of Guild Court warrant was granted to Mr. W. Hamilton Beattie to make alterations on the Clarendon Hotel, Princes' Street, with a view to the introduction of a lift, the widening of the entrance, the connecting of the east gallery of the Princes' Street Arcade with the hotel, and other improvements.

ALL SAINTS' CHURCH, Hertford, was completely destroyed by fire on Monday, the 21st inst. The fire was discovered at five o'clock, and it then had such a hold upon the building that there was no chance of subduing it. A valuable organ and several memorial-windows were destroyed. The only things saved from the fire were the old registers. Last Sunday week the church was broken into by burglars. The building is partially insured.

THE flannel-mill of Mr. Alfred Tattersall, at Wardle, near Rochdale, has been destroyed by fire, and damage to the extent of about 500*l.* was done to the premises of Mr. James Stott adjoining. The damage in Mr. Tattersall's case is estimated at from 8,000*l.* to 10,000*l.*

RATTON HALL, near Eastbourne, belonging to Mr. Freeman Thomas, has been destroyed by fire. Excepting the valuable contents the loss has been small, the house having no architectural interest, and its rebuilding had been proposed.

A FIRE has occurred on the premises of Messrs. Pollard & Heys, Gateside Printing Works, Barrhead, Glasgow, and resulted in damage to the extent of about 8,000*l.*

THE main building of the Church of England Training College at Carnarvon has been destroyed by fire.

THE Gilesgate Infant Board School, Durham, is about to be enlarged for the Durham School Board, from designs by Mr. H. T. Gradon, A.R.I.B.A., Architect, Durham.

TRADE NOTES.

THE Town Council of Alloa have entrusted the ventilating and heating of the municipal buildings to Messrs. Baird, Thompson & Co., ventilating and heating engineers, London and Glasgow. The County Council have also instructed this firm to examine and report upon the heating of the county buildings and prepare plans.

THE Barrow-in-Furness Board-schools are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

MR. W. H. RADFORD, C.E., of Nottingham, has been instructed by the Corporation of Durban to advertise for tenders for the supply of electricity to the inhabitants of Durban, and for the lighting of the public streets. The population is about 24,000 and there are no gasworks.

MESSRS. GOODMAN, HUGHES & CO. had a sale last week at their new auction mart, 44 Bishopsgate Street Without, of deals, battens, boards, mouldings and other wood goods. There was a fair attendance of buyers, we understand, and a good number of lots were disposed of at prices that were considered fairly satisfactory. It is expected that another sale will be conducted by the same firm in the early part of the new year.

A PULPIT has been placed in the church of St. John the Evangelist, Stand, near Manchester, as a memorial of the late vicar, the Rev. W. D. Carter, M.A. The pulpit is of veined alabaster, with a base of Hopton Wood stone. Around the

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pulpit are three niches with green marble shafts. Two of the niches contain tracery, and the centre one holds the figure of St. John accompanied by his eagle, carved in white alabaster. The work has been carried out by Messrs. Earp & Hobbs, from drawings by and under the direction of Mr. J. Medland Taylor, the architect of the church.

A VERY handsome memorial brass, designed to suit the architectural features of the justly celebrated Norman church at Melbourne, near Derby, has just been erected in the "Cantrell" chapel, to the memory of the last bearer of that name who was buried in the cemetery at Melbourne. The distinctive feature of the design is a large copper cross embellished with agates. The inscription is written in mediæval Latin, and is enclosed in an incised border of a Celtic character. The work was entrusted to Messrs. Jones & Willis, of Birmingham and London.

THE Bilston Town Commissioners have appointed a subcommittee to consider the question of providing a new fire-engine and appliances.

IN another column we notice a few of several fires that have occurred during the present cold snap. With the improved appliances for heating, whether by use of coal, hot air or hot water, fires are, we fear, far more frequent than need be, and seem to imply that the precautions for safety have been neglected. It must be also remembered that in regard of fire-extinguishing appliances no one need be without an additional safeguard in case of fire.

WITH the present issue "Calvert's Mechanics' Almanack" reaches its nineteenth year of publication. It contains, in addition to the usual matter of an almanack, practical, technical and industrial information, especially instructive and entertaining to artisans and handicraftsmen and those generally engaged in mechanical, engineering and building and constructive trades, decorative, artistic, manufacturing and kindred operations; also original calendar notes, references relating to events, inventions, inventors and biography, &c.

THE "Railway Diary," by Messrs. McCorquodale & Co., Limited, is especially useful as a railway officials' directory, and, it may be added, to professional men and many of the general public, who often require unexpectedly the information which they could not otherwise obtain at the moment.

THE lighting of the Opera House, Covent Garden, for the forthcoming season of "Fancy Dress Balls" has been entrusted to the Wenham Co., Limited, by Sir Augustus Harris. The company are supplying the lamps for the outside lighting of Drury Lane Theatre during the pantomime.

THE following tenders have been accepted for work in connection with the new arcade and shops in Old Market, for the Halifax Corporation, in place of others withdrawn:—G. Townsend & Son, carpenter and joinerwork, 2,940*l.*; Birkby & Sons, Wyke, excavator, mason and bricklayerwork, 6,520*l.*

AT the meeting of the Featherstone Local Board a letter was read from Lord Masham intimating an offer to light North Featherstone for a term of fifteen to twenty years with electric light, or so long as the coal on the Ackton estate lasted and continued to be worked, for the sum of 20*l.* per year and 4*d.* per hour during the time the current was used. The offer was accepted.

AN extraordinary general meeting of the shareholders of the Gas Company has been held for the purpose of considering proposals for the extension of the gasworks. To provide the site for additional gas storage, &c., the directors have purchased two acres of land near the present works on the Newbold Road, and they propose to put there a double-lift holder, 100 feet in diameter, on the telescopic principle, at the estimated cost, with the necessary valves and connections, of about 7,000*l.* They propose also to enlarge the retort-house, to place therein retorts of the regenerating principle, and gradually to replace the present retorts with others of the regenerating kind.

CONTRACTS for the new Lancashire and Yorkshire Bank, in Commercial Street, Halifax, for which Messrs. Utley & Gray are the architects, have been let as follows:—Mason, &c., work, W. Sutcliffe, Sowerby Bridge; carpenter and joiner, S. Greenwood, Halifax; slater and plasterer, J. Bancroft & Sons, Halifax; and plumber, &c., J. Naylor & Son, Halifax.

AMERICAN NOTES.

THERE has been a great deal of criticism, *Stone* of Indianapolis says, on the pavement question in American newspapers. But in American cities it is universally the practice, as soon as a pavement is laid, to tear it up again for the laying of mains and pipes. There is no pavement that will withstand such treatment. No matter how secure the foundations, or how well the pavement be laid, nor of what material, it will be injured if not ruined by tearing it up in portions for street purposes. In

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truth, the heavier the foundation and the better the work the more it will be injured by being torn up in sections. A scheme for street improvement should include not only improvements for the moment, but should anticipate the future. It is ruinous to spend good money for one improvement to ruin it by other improvements. A municipality should include the paving with the other improvements, and when a street is improved it should be perfected. As it goes in American cities we neither have the pavements, the improvements, nor the money they cost. They would cost less at beginning and would last five times longer, and while lasting would be five times better, if they were carried through on a definite plan. Sewers, gas and water mains, and electric conduits are as much a part of street improvements as pavements, and the improvement should include the whole or none.

THE *American Manufacturer* says in regard of iron ore that the famous Dickerson Mine, on Mine Hill, New Jersey, which has been one of the prolific mines of the State, and is certainly the oldest known within its borders, has suspended operations, the lessee having reached the conclusion that it could no longer be worked with profit. With it is closed the last of the various mines once operated on and about Mine Hill, and no regular mine is now being operated south of Irondale. The business of the Ferro Monte Railroad, which carried the ore from the Dickerson Mine to a spur of the Chester Railroad, is also closed. The Dickerson Mine was the oldest in the State, though it had not been the most productive. It was originally taken up as a mining tract in 1716. It is stated that ore from this mine was used during the war of the Revolution to make cannon balls for the Continental army, the ore so used being taken to what was known as the Tory Forge, at Andover, Sussex county, a forge which was owned by Tories, but was leased by the Continental authorities for this purpose. The ore was from the beginning of the best quality.

THE French Consul at Chicago has applied for 130,000 square feet of space in the exposition buildings, viz. in the manufacturers' building, 100,000 square feet; in the fine arts building, 20,000; in the machinery-hall, 10,000. Space will also be required in the mines and mining, agricultural and horticultural buildings.

THE Edge Moor Bridge Works, of Wilmington, Del., has been awarded the contract for the ironwork for the administration building of the Columbian exposition, the amount of the contract being 429,000 dollars.

VARIETIES.

AT the meeting of the Association of Birmingham Students of the Institution of Civil Engineers, held at the Midland Institute, the president, Mr. J. Edward Willcox, C.E., delivered a lecture on "Details of Plumbing Work."

THE Tasmanian Parliament has sanctioned the expenditure of 700,000*l.* on the construction of public works, and has also granted numerous concessions to syndicates to construct railways, tramways and electrical services for the new mineral country.

THE Glasgow Agricultural Society propose to erect a Scottish Agricultural Hall, which will be carried on on similar lines to the Royal Agricultural Hall at Islington. The suggestion was first made several years ago, and though plans were made, estimates got out and site selected, the project was abandoned.

THE Birmingham Art Gallery has been enriched in the permanent collection by a water-colour drawing by Dante Rossetti, entitled *Sir Galahad*, being the original design for the illustration in Moxon's edition of Tennyson's poems, and two beautiful pre-Raphaelite works, *The Annunciation* and *The Nativity*, by Mr. Arthur Hughes. The committee have also purchased two fine water-colour drawings by Peter De Wint and Mr. Alfred W. Hunt, R.W.S. The family of the late Mr. George Wallis, who many years ago was head-master of the Birmingham School of Art, have presented to the Museum a bronze bust of Mr. Wallis, by Mr. Albert Toft.

AT the meeting of the Southampton Town Council a letter from the borough surveyor, Mr. W. B. G. Bennett, was read stating that he wished to become a candidate for the office of chief surveyor to the vestry of St. Pancras.

IN restoring the chancel of Tarvin parish church the open timber roof dating from the Middle Ages, which had been hidden by a ceiling, was reopened. The works have been carried out under the direction of Messrs. Grayson & Ould, architects, Liverpool.

AT the general meeting of the Channel Tunnel Company, the engineer reported with reference to the trial borings for coal as follows:—"Since my last report announcing the discovery of a 2 feet 3 inch coal-seam we have bored through 196 feet of hard, grey, jointed sandstone, and have just proved another seam 2 feet 6 inches in thickness of good bright house

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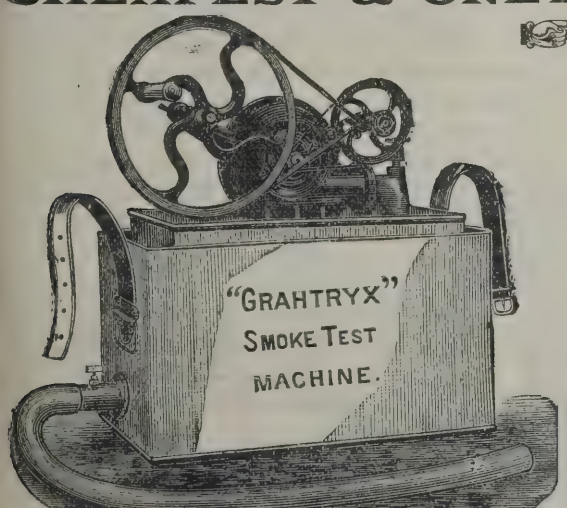
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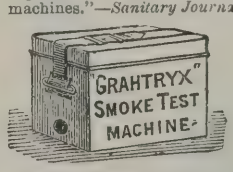
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FROM THE LONDON AND SUBURBAN SANITARY SURVEY ASSOCIATION.

"Connaught Mansions, Victoria Street, Westminster, S.W.: April 24, 1890.

"I have now had one of your 'Grahtryx' Smoke-Test Machines in use some time, and find it exceedingly useful and reliable. I inspect several hundred houses annually, and in many of them I find something more than the ordinary smoke tube absolutely necessary, and your machine meets that want. It is, I consider, the most portable, compact, well-fitted, and perfect little machine in the market, and invaluable to all Sanitary Authorities, Engineers, Inspectors, and Plumbers. It should also be of great value to Nurserymen, Plant-growers, Florists, &c., as an exterminator of green fly and other pests. I have tested it in this way in my own vinery, conservatories, &c., and find it most efficient when used with tobacco paper. It should also be of great service to gamekeepers for the rabbit warrens, and for bolting rats. "EDWARD TIDMAN, C.E., M.S.A., and M.P.S.I., and A.S.M."

FROM THE GLASGOW SANITARY PROTECTION ASSOCIATION.

"In reply to your inquiry, I have to state that I have had the Smoke Machine in daily use for over six months (on about 200 different occasions), and have found it very satisfactory, both as regards efficiency and handiness. "GILBERT THOMSON, M.A., C.E."

BAIRD, THOMPSON & CO., *Ventilating, Sanitary, Heating and Consulting Engineers,*

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coal at 1,810 feet from the surface. This makes the seventh workable seam of good bituminous coal found. The aggregate thickness of the seven seams may be taken at 14 feet 6 inches. The indications of deeper seams are still favourable."

AT a meeting of the committees having charge of the erection of statues to the memories of the late Thomas and Sir Peter Coats, of Paisley, for which over 4,000*l.* have been collected, held at Paisley, a letter was read from Mr. Dunn, M.P., offering two sites on the vacant space at Paisley Cross. The offer was accepted, and Mr. Dunn was thanked. A committee was appointed to obtain competitive designs.

WE regret to record the death of Mr. Edwin Thomas Howell, architect, of Southampton, on the 12th inst., aged eighty-seven years.

AT a conference on the subject of "The Disposal of the City's Refuse, Manchester," held in the Co-operative Hall, Ardwick, under the presidency of Dr. Arthur Ransome, the general opinion was in favour of the most objectionable forms of refuse being dealt with outside the city.

THE borough surveyorship of Luton has been resigned by Mr. J. E. Lovegrove, in consequence of his having been appointed borough surveyor to the Town Council of Richmond.

THE Dublin Trades Council have issued a report upon the necessity of concentrating public attention upon the advisability of consuming home-grown produce in preference to foreign, in order to divert unskilled labour from the towns to the agricultural districts. The Council propose organising conferences between representatives of the Irish and English working classes to consider the subject upon a mutual basis.

THE Society of Arts offer a gold medal, or 20*l.*, for the best invention having for its object the prevention or extinction of fires in theatres or other places of amusement. The competition is to close at the end of the year.

AT Stoke Prior, near Leominster, discovery has been made in a coppice by Mr. V. J. Godley, while digging to release a ferret, of silversmiths' work. The vessels, the *Birmingham Post* says, consist of a chalice, two cups, a paten and a beautifully-gilded and chased vessel, combining the paten, the water-holder, and a perforated vessel for incense; and those who have had the opportunity of seeing them naturally conclude that they have been used in the services of some Roman Catholic church. The hall-mark is upon each vessel. The chalice is the oldest vessel, its date being 1578–79; that of the sacramental cups is 1594–95, the large vessel standing upon three claws 1596–97 and the paten 1639–40. On three of the vessels there is a crest, the body of a fox on four legs and the initials "F.E.A." Early in the New Year a public inquiry will be held with reference to the discovery.

THE VICTORIA STATION.

THE London, Brighton and South Coast Railway Company have in view the enlargement of their Victoria Station, for which purpose it will be necessary for them to acquire, either compulsorily or by agreement, land lying between the station and the Buckingham Palace Road, and extending from Belgrave Road on the south to Wilton Road on the north. Parliamentary powers are also sought to enable the railway company to stop up that part of Wilton Road which lies between the Buckingham Palace Road and the western entrance to the station, substituting therefor an improvement of Wilton Road, which would comprise a new junction with the Buckingham Palace Road immediately to the northward of the site of the present junction, and also a widening of Wilton Road. It is further proposed to reconstruct what is known as the Elizabeth Road Bridge, which carries the St. George's Road over the Grosvenor Canal, and over the railways of the London, Brighton and South Coast and the London, Chatham and Dover Companies, and at the same time to widen the former company's railway, for which purpose it would be necessary to take the towing-path and part of the waterway of the Grosvenor Canal.

TOWN COUNCILLORS AND MUNICIPAL CONTRACTS.

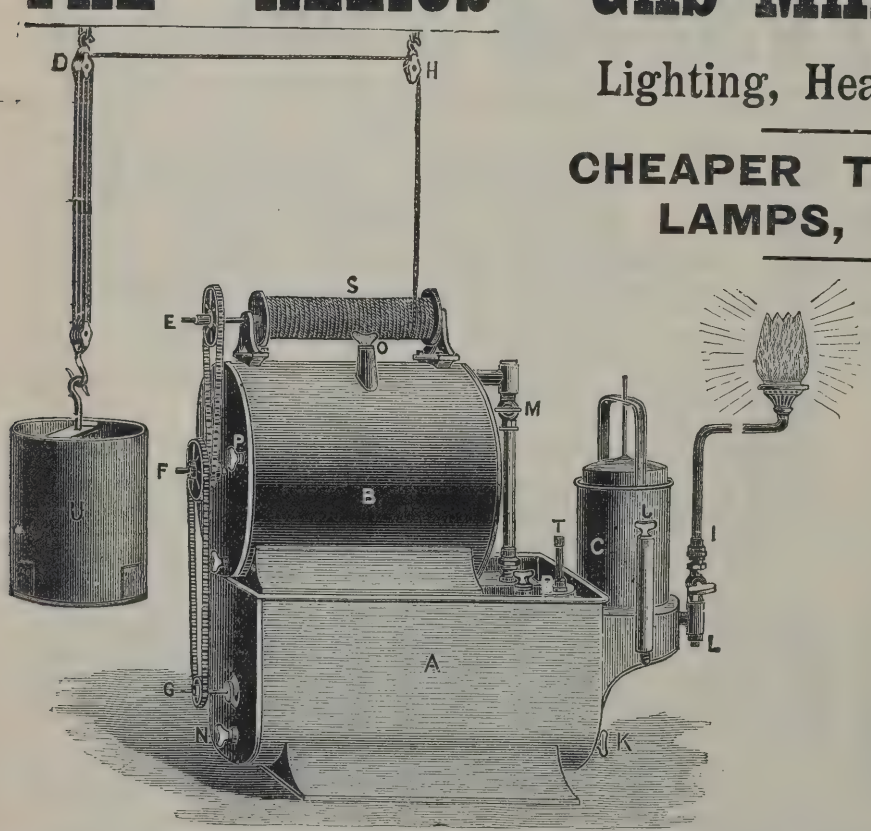
AT a recent meeting of the Glasgow Town Council Mr. Cleland asked the following question:—Is it competent for the Town Council, as Water Commissioners, or in any other capacity, to enter into any contract or agreement for the executing of any work or the furnishing of any labour or materials with any individual member or members of Council, or with any firm or company of which such member or members of Council may be partners, directors, managing director or shareholder; and, further, does No. xx. of the standing orders of the Town Council, apart from the common law on the subject, disqualify or prevent any such individual member or members

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of Council from being in any way interested in or concerned with any such contract or agreement, even although he or they may be partner or shareholders merely of the firm or company with which such contract or agreement is proposed to be made?

The Town Clerk (Sir James Marwick) said:—The question now put to me is important, and requires a careful and detailed answer. The general law as to the illegality of persons in fiduciary positions entering into contracts with themselves for the execution of work from which they are to make profit is not doubtful, and I cannot state it more distinctly here than I had occasion to do in 1879 in a work which I then published on the "Law and Practice with regard to municipal elections in Scotland." The magistrates and councillors of royal and Parliamentary burghs and burghs of regality and barony, and the commissioners of police in burghs and places which have adopted the General Police Act of 1850 or 1862 are public trustees, and, as such, are subject to the liabilities, responsibilities and disabilities imposed at common law upon trustees and persons in fiduciary positions. They are bound in Scotland, as in England, to maintain a position of absolute disinterestedness, and to enter into no transaction in which their own personal interest may conflict or come into competition with that of the estate under their administration. They cannot therefore in their fiduciary character legally enter into contracts or transactions with themselves as individuals. So absolute is this rule that the Court will allow no investigation into the fairness or unfairness of the transaction. It will be held to be enough that the parties interested object. "It is a rule of universal application," said Lord Chancellor Cranworth, "that no one having such (fiduciary) duties to discharge shall be allowed to enter into engagements in which he has or can have a personal interest, conflicting, or which may possibly conflict, with the interests of those whom he is bound to protect." Mr. M'Laren, now Lord M'Laren, still further questions the statement. Hence we deduce the more general rule that trustees are under a disqualification from entering into any personal transactions with the trust. While such is the rule at common law, various general Acts contain provisions on the subject, which are frequently incorporated with local Acts. In some cases also local Acts contain special provisions which carry the principle further than the common law does. But it appears to me to be clear that the principle of the law of Scotland, as well as that of England, which has been adopted from the civil law, applies to all persons in any fiduciary capacity. There seems no room for doubt, therefore, that no councillor can make profit out of any work done by him as an individual for the Council of which he is a member or for any of the trusts under its administration. It will be for the Council, having regard to the interests both of the Corporation and of its contractors, to determine what action should now be taken in regard to this matter. In view of its importance, I think the opinion of counsel should be taken upon it.

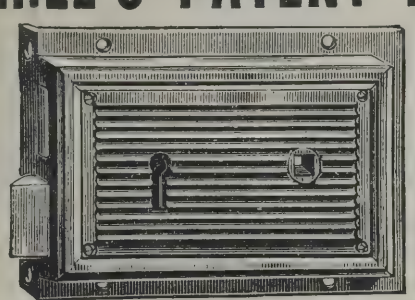
Mr. Stark begged to move that the Council take the opinion of counsel, as suggested by Sir James Marwick.

It was after a consideration agreed to delay the subject till next meeting, and that in the meantime the opinion of Sir James Marwick should be printed and circulated amongst the members.

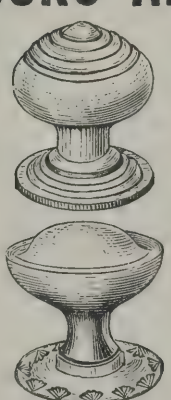
THE ALEXANDRA PALACE.

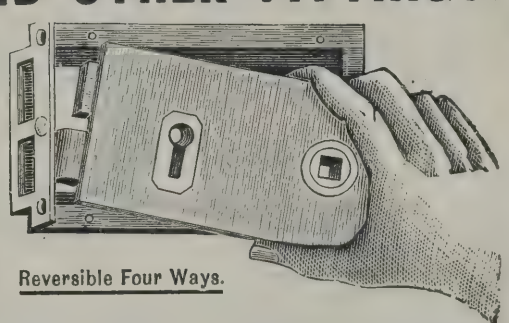
AT the last meeting of the Middlesex County Council, Mr. Littler, Q.C., the chairman, who had drawn up a lengthy scheme for the acquisition of the Palace and Park, moved that the matter be referred to the Parliamentary Committee, as a Bill was being prepared by the owners of the Palace and Park for the sale of the estate. This was also agreed to. The scheme prepared by the Chairman stated that the Financial Association, who owned the Palace and grounds, were prepared to sell the whole of the 414 acres to the Council for 275,000*l.* There were besides 28 acres of leasehold land, and the purchase of that would cost about 16,800*l.* He suggested that the partitions in the building should all be removed, and the Palace should be thrown open from end to end, that a number of semi-hardy trees, &c., should be placed in the building to form a public covered promenade. The amount required for the purpose of buying the buildings and grounds would be about 300,000*l.*, which he proposed should be raised. The London County Council might give 100,000*l.*, the Corporation of London 40,000*l.*, the Middlesex County Council 15,000*l.*, and the local authorities the remainder, 145,000*l.*, and he thought the railway companies would subscribe on the principle of giving to seaside piers. The Great Northern Railway would construct a new railway from Wood Green Station into the Palace. Practically the whole of the buildings, save on certain days, and with the exception of the theatre and concert-rooms, should be absolutely free to the public. Portions of the grounds should be devoted to games of every kind. Good music should be provided in the fine weather in the open air, and in bad weather in the Palace, together with organ recitals, &c.; and, lastly,

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All kinds of Rim and Mortice Locks, Door Furniture, Sash and Casement Fittings, Swing-door Hinges, &c., kept in Stock. (1)



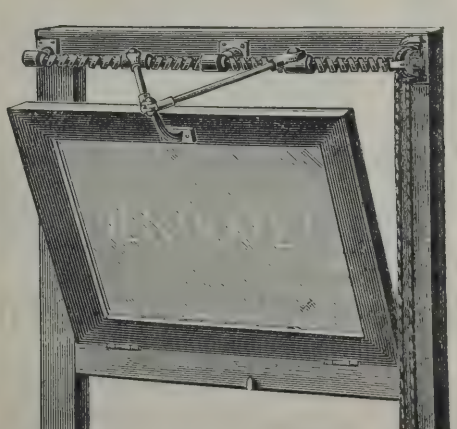


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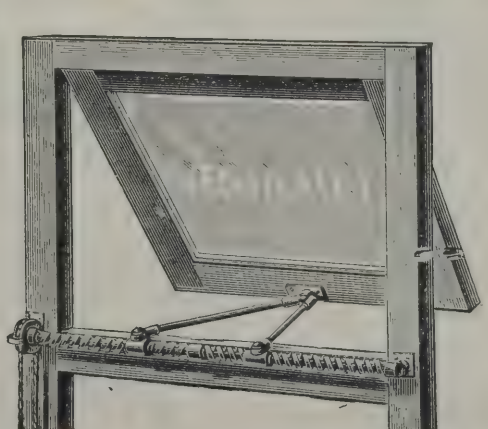
Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod on right or left side.

(Triple-Action Bolt.)

(Patent Bolt for Narrow Stiles.)







JAMES HILL, 100A QUEEN VICTORIA ST., LONDON, E.C.

accommodation might be given on excepted days and in special spots for horticultural, industrial and other shows. The proposal goes on to say:—"A very important feature is the preservation of the grounds, as the open space relates to the national defence, the hill commanding the Lea Valley and the Northern and Eastern Railways and also the New River, and in case of invasion would be invaluable for the protection of London. The maintenance of the Palace and Park should be upon equitable terms, arranged between the various authorities who will contribute to the purchase. Some small strips of land around the Palace and Park could be used for building purposes, and would bring in about 2,100*l.* a year. A source of income might be derived from refreshment contractors—say 5,000*l.* per annum; from the letting of stalls, 1,200*l.* a year, and from the theatre and concert-rooms 1,000*l.* a year. The expenses he would put down at 7,900*l.* a year, and the receipts above estimated 9,200*l.*"

The Parliamentary Committee were instructed to consider the matter and report at an early date.

PRIVATE BILLS FOR NEW WORKS.

THE last day for the deposit of private Bills at the Private Bill Office of the House of Commons is December 21. Plans, sections and books of reference have to be deposited on November 30, but notice has also been given of several Bills in respect of which no plans, &c., are required to be deposited. Among the Bills of local and general interest for the coming session are the following:—Alexandra Palace and Grounds, Baker Street and Waterloo Railway, Bedford and Grand Junction Canal, Central London Railway, City and South London Railway (Islington Extension), Channel Tunnel (Experimental Works), Borough Market, Southwark, Corporation of London (Stamps and Loans), East and West India Dock Company, East Indian Railway Company, Epsom Downs Extension Railway, Great Northern and City Railway, Hampstead, St. Pancras and Charing Cross Railway, Imperial Life Assurance, Lea Valley Drainage, London, Brighton and South Coast Railway (Various Powers), London, Chatham and Dover Railway, London County Council (General Powers), Subways and Tramways, London, Tottenham and Epping Forest Railway, London Tramways (Extensions), London Water (two Bills), Manchester, Sheffield and Lincolnshire (Extension to London), Manchester Ship Canal, Metropolitan Railway, Midland Railway, National Penny Bank (Limited), National Telephone Company, New Telephone Company (Limited), North British and Mercantile Insurance Company, North Metropolitan Tramways, Railway Passengers' Assurance Company, Regent's Canal, City and Docks Railway, Royal Bank of Scotland, Officers' Widows Fund, Royal Exchange and Waterloo Railway, St. Pancras Vestry, South-Eastern Railway, Southend Gas, Southend Marine Lake, Union Society and Union Life Office, Ward Electrical Car Company (Limited), Waterloo and City Railway, and Westminster (Parliament Street, &c.) Improvements.

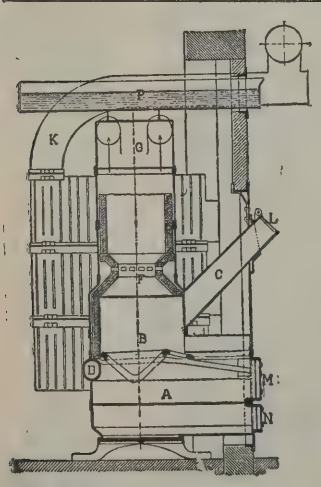
THE SANITARY CONDITION OF FLORENCE.

THE report on the sanitary condition of Florence made to the Sindaco of the city by Sir Douglas Dalton, K.C.B., begins with a general description of Florence so far as relates to its sanitary condition, showing, *inter alia*, as regards rainfall that it is subject in summer to occasional torrential storms. It describes the various sanitary improvements of the last twenty years, namely, the abolition of slaughter-houses in the town, the new water-supply, the new drainage, the removal of insanitary dwellings, and the effect of these on the death-rate, which was reduced from an average of nearly 36 per 1,000 in 1873 to 25 per 1,000 in 1890, although in that year the typhoid epidemic developed itself. The report then proceeds to describe the water-supply and the drainage, the new building laws, the scavenging and removal of refuse.

To the contamination of the water the typhoid epidemic was somewhat hastily attributed. Formerly all houses had their wells, which are from 25 feet to 40 feet deep, into the beds of gravel, sand and clay which underlie the bed of the Arno, and on which the city stands. The cesspits were originally also excavated out of these strata, and although lined with brickwork and cement and made more or less impermeable, yet the water of many wells has been contaminated. There are two sources of extraneous supply—one from the Monte Reggi, from the gravel and sand beds, in which the river Mugnone runs (a tributary of the Arno), which was originally provided by the Medici, and supplied the Pitti Palace and other places on its way. This was extended about twenty years ago by one of the family of the Canta-Galli at his own expense. It is delivered by gravitation into a reservoir 60 mètres above the level of the quay at Florence, but since its extension it has occasionally become turbid in times of much rain. Last

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year it was alleged that the contamination of this source had caused the typhoid epidemic, and it was cut off. The analysis of the water made at the time did not bear out this contention. The other extraneous source of supply was constructed between 1873 and 1876. It consists of two galleries carried at a depth of some 12 feet or 14 feet below the bottom of the Arno. They start from the waterworks, which are situated on the quay on the south side of the river near the Via dei Bardi. One is carried under the river-bed to the opposite side, and receives water from a well situated near the Campo di Marte. The other is carried up the valley parallel to and about 70 mètres distant from the river. Both are in the gravels and sands in which the river-bed is situated. The galleries are of masonry; water is admitted through openings in the bottom and through holes in the sides, the latter at distances of about 5 feet apart and 2 feet from the bottom. The part of the gallery which passes under the town has been recently made impermeable, and water is now collected only from that part, 60 mètres in length, which lies under open fields above Florence. The water is pumped out by turbines driven by the water of the Arno into three reservoirs, at heights of 60 and 40 mètres above the level of the quay, and thence distributed by gravitation. These reservoirs are capable of holding 36,000 cubic mètres. This water is always clear and good. The quantity may be said to vary from 5,000 to 10,000 cubic mètres in the twenty-four hours, according to the season. At the present time out of 12,000 houses in Florence about 3,200 receive the town supply, and there are, moreover, 180 public fountains or stand pipes. It is proposed to extend the gallery up the valley from 300 to 400 mètres, according as may be necessary to bring up the supply to the present required quantity of about 24,000 cubic mètres a day, and to protect the surface in the vicinity from any pollution for a considerable distance. The Municipality have recently bought springs in the mountains near Lucca, which can supply 60,000 cubic mètres in twenty-four hours at a high level, but these springs are 70 miles from Florence, and it will require some three years at least to bring the water into the town. Meanwhile the gallery, when extended, will supply all that is required.

The drainage was designed partly to prevent the flooding of the town in times when the Arno was running full. A committee laid down in 1873 the system of drainage to be adopted and the conditions to be observed in carrying it out.

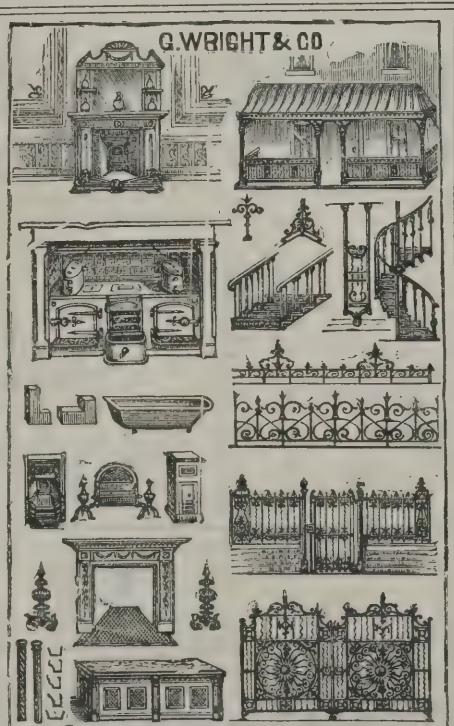
1. The drains were to receive rainfall.
2. The drains were to carry off the refuse house-waters; the cesspits were to be reduced in size by the adoption of portable barrels, called *asportabili*, with overflow for the liquid matter, which was to be passed into the drains, the solid matter being retained and removed periodically.
3. They were to be of a size to be accessible to all parts, but the bottom was to be provided with a cunette of circular section to carry off the limited flow of house-water.
4. The communication between the big street drain and the houses was to be by means of square lateral drains laid close to the houses, of a section of about 18 by 24, with covered galleries of communication at every 60 or 70 mètres leading from the side drain into the main drain. These lateral drains were not to receive the waters directly, but pipes were to be laid in them from the houses, one pipe being laid to bring the house water, and another pipe to bring the overflow from the *asportabili*, which was to be carried down to deliver under water. When cesspits were retained there was to be no overflow from them into the drains.

Of these drains about one-half have been completed, but except in general section they have not adhered uniformly to the type laid down. The cunette has often been made rectangular instead of circular, which therefore favours deposit. The pipes of communication in the lateral drain have not been generally adopted. Outside the Viales, where drains have been constructed, a different pattern has been adopted, which is also large enough to pass through, but these drains have an almost flat bottom made the full width of the drain, which is well calculated to promote deposit. There is no ventilation for the drains except the street gullies, when not trapped, and the house drains which have no intercepting arrangements. About one-half the town has been laid with these drains as approved by the Commission of 1873, but as already mentioned, the rules laid down by them were not strictly adhered to. The old-fashioned drains in the rest of the town are rectangular, about 2 feet by 1 foot 6 inches in section, and about 3 feet to 4 feet under ground, generally leaky with deposit.

The recent building regulations for new houses contain some good points, especially as to height of houses in relation to width of streets and as to light and air to the backs of houses, and they require that all latrines should have direct access to light and air. Cesspits are to be impermeable. As a rule the fæcal matter is retained in cesspits, generally under the houses, sometimes under the courtyards. The *asportabili*, which, as already mentioned, consists of a small barrel with a grating at one side, which allows the liquid to escape into the

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Bradford Town Hall	Crawley Parish Church
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Sherborne Abbey	Windermere Church
Sydney Town Hall, N.S.W.	Eiffel Tower, Paris
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Royal Military Exhibition, &c., &c., &c.
GOLD MEDALS—HUDDERSFIELD, 1883; LONDON, 1885.
SILVER MEDAL—PARIS, 1889.

drains, has been adopted in by from 12 to 15 per cent. of the houses. It is unnecessary to say that this liquid is in a highly putrescible condition, and as the drains are not free from deposit causes nuisances in summer and is always dangerous.

There are about 11,000 cesspits under the houses in Florence, which contain at a low computation on an average 10 cubic mètres each of fæcal matter. These cesspits in some cases have not impermeable sides, and even when the sides are cemented the arch is not cemented, and undoubtedly the gases pass up through the brickwork into the house. They are emptied by the aspirating process. If the material is rich, they are emptied for nothing. When much water is used, it costs about 1 fr. per cubic mètre. In the case of several houses examined it was found that to avoid the frequent emptying of the cesspit an overflow had been arranged either into the house-drain or the street-drain. Of the *asportabili* there are from 1,500 to 2,000 in use, which are changed, some once a week, some once a month, some more seldom. The price varies similarly, according to value of contents, up to 22 frs. annually.

A consideration of the circumstances attending the epidemic of typhoid of 1890-91 affords the best measure of the sanitary state of the town. A considerable amount of typhoid fever had occurred during the autumn in the country round Florence, and at Prato about 200 deaths had occurred in November. The total number of cases of typhoid fever which occurred from the end of November 1890 to March 1,891 was 1551, of which 326 cases were military cases in the barracks, which leaves 1,225 civilian cases. Of the military 16 and of the civilians 23 died. The epidemic centred itself chiefly in four localities, and a detailed examination of these was therefore made.

These localities were—(1) The barracks of Belvedere and San Giorgio, and the streets extending thence to the Maggio and the Ponte Vecchio; (2) the part extending thence up the Via Romana; (3) the district between the Mercato Movo, the Piazza Signoria and the Por San Maria; (4) the locality near the Via Faentini and thence to Viale Vittoria Regina.

A detailed inspection was made of almost every house in these several localities. Of the houses in which cases occurred about one-third had water laid on from the town supply. The other two-thirds were supplied by wells, but, of course, to these latter the public fountains were accessible. These four centres of the development of the disease were all situated in parts of the town where either the old square drains were in use, except in the case of the Viale Vittoria Regina, where the inclination of the drain has favoured deposits. These drains all contained more or less deposit.

The simplest way to elucidate the spread of the disease in these localities will be to take two examples. The chief outbreak occurred in the barracks of Belvedere and San Giorgio, which are in close connection with one another. The troops had made frequent marches into the country during November and into localities where typhoid fever was prevailing. The first cases among the soldiers occurred early in December. In Belvedere Barracks, out of a garrison of 318 there were 117 struck with fever, and in San Giorgio, out of a garrison of 450, 107 were laid up. The men when first taken ill were kept under observation in the barrack infirmary before being sent to the general hospital. In the infirmary their evacuations, not disinfected, went into an *asportabili*, which had an overflow into the barrack-drain. The barrack-drain was of the square flat type, full of deposit, often covered only with flat stones, and it meandered through the barrack under some buildings, and close to wells not entirely disused, through courtyards with openings at intervals for waste water, until it joined the street-drain without any intercepting trap or other arrangement. The street-drain of similar pattern was leaky and full of deposit. It passed through the street and was joined by the house-drains without interception. Into these latter the waste-pipes from sinks and gullies emptied untrapped, and the street-drain, and frequently the house-drain, received the overflow from the *asportabili* and sometimes from the cesspit. The drains thus afforded a convenient passage for the exhalations from the main drain throughout the houses. If there was town water laid on the supply was intermittent, and the sink waste-pipes passed directly into the drains, and had no trap, so that the exhalations from the drains could be easily drawn into the pipes. In the houses the pipe from the cesspit or *asportabili* was led straight up to receive the connections from the latrine on each successive storey, and this pipe afforded the only ventilation to the cesspit. The latrine generally opened directly out of a bedroom, or a kitchen, or a living room, or was close to them. Often it had no opening of any sort, except into the room, and this formed the only ventilation for the cesspit.

One instance will suffice to exemplify the facility with which the fever could be spread under these conditions. There was a house in the Via Vachenegia which had two cesspits, one of which had an overflow into a drain which passed through the back of the house into the Chiasso del Bucco, and thence through the Via Lambertesca into Por San Maria. There were

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en cases of typhoid in the part of the house whose latrines otied into the cesspit which had the overflow. No cases urred in the apartments which used the other cesspit. ere were four cases in two of the houses in Chiasso del co whose sinks communicated with the drain. Six cases urred in Via Lambertesca and seven cases in Por San Maria, in houses communicating with the drain—twenty-four cases all. This is only one of many instances.

The recommendations resolve themselves into—

1. Closing all the wells and developing the present water pply, because this can be done at once at no great expense extending the existing gallery. It is clearly better to lise at once that which is a good supply, and to allow the ieme for bringing in an ideal water supply from the untains to stand over until the more pressing want of nodelling the drainage system is completed.

2. To spend all available money in completing a drainage stem by which the large mass of fæcal matter (at least 0,000 cubic mètres) now lying under Florence should be moved and carried away by drains to be applied to irrigation, her by utilising and extending the present system with difications to adapt it to modern experience or else to adopt eparation system. The report leaves this question an open e until a plan of the actual condition of the present drains s been made, so as to enable an accurate estimate of cost of her arrangement to be made.

3. Thorough and immediate revision of the house drains, iich are almost invariably square in section, flat-bottomed and nerally leaky, including interception from street drains and her obvious suggestions.

4. The extension of the present system of sanitary inspection include all the sanitary conditions of houses.

5. Until the town drains have been revised stringent regulaons should be adopted to prevent overflows from cesspits or *portabili* into the drains. That instead of the wooden *portabili* a metal one should be substituted without overflow, the principles of the French *tinette*.

That the existing rules as to impermeability of cesspits be rongly enforced; that cesspits should be ventilated independently of the pipes of the latrine; that all latrines should be osed which had not direct access to light and air, or which pen directly into living rooms.

In conclusion, the report observes that the epidemic on this ccasion was limited to those parts of the town in which there ere obvious sanitary defects. And as an evidence of the gradual improvement of health in Florence, it mentions that an epidemic of typhoid in Florence which occurred about twenty-one years ago carried off 914 victims, or at the rate of 5 per 1,000 of the then population.

The epidemic of last year carried off 234 victims, or 1·2 of the population. The death-rate, which was nearly 36 per 1,000 twenty years ago, has been gradually diminishing. It averaged 32·9 per 1,000 for the six years from 1877 to 1883, and 26·8 per 1,000 for the seven years 1883 to 1890; and in 1890, notwithstanding the typhoid epidemic in December, it was 25·1 per 1,000. But undoubtedly typhoid still lingers in Florence; in the six months of May to November 1891 there occurred 45 deaths in the city, of which 12 deaths occurred in November. Therefore, however much Florence may have improved its health conditions in late years, all persons interested in its progress must hope that it will complete its efforts in sanitation by an early and thorough revision of its drainage system, and thus become one of the most healthy, as it is one of the most beautiful, cities in the world.

PUBLIC FOUNTAIN IN MEMORY OF LATE R. F. O. FARQUHARSON OF HAUGHTON.

A SHORT time after Mr. Farquharson's death, which occurred in the spring of 1890, a strong desire was expressed by his friends and neighbours that a public memorial should be erected to his memory. A committee was appointed, and had under inspection several designs, from which they unanimously selected a design presented by Mr. Alex. Hogg, surveyor, Alford, the principal elevation of which we have produced. The whole structure is composed of granite finely dressed, several parts of which are polished. Besides being a substantial structure, the fountain will be a great convenience, and will form a special feature in the village, situated as it is at the point of a triangular piece of ground in front of the Haughton Arms Hotel, near the market stance, and where several roads meet the principal thoroughfare. The principal elevation looks down the village, and the monument can be seen with advantage from all sides.

Around the site of the structure the approaches are neatly pitched with "setts" having proper falls and escapes for surface-water. The plan is square, and the ground design has a Norman character. The pedestal is erected on a daïs approached by steps, the blunting of the front corners of which give it an

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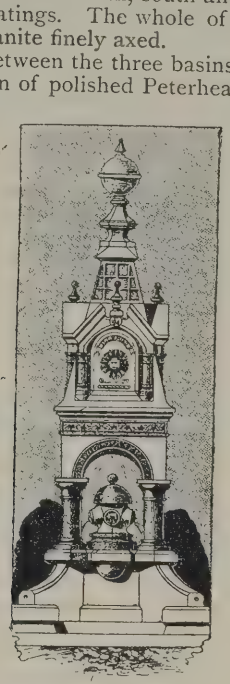
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octagonal appearance. At these corners are placed troughs for cattle and horses. At the angles of the centre-piece are diminishing buttress stones, the top of which is coped by the basin table which has splayed projection and polished top. There are basins on the north, south and east sides, polished inside with brass gratings. The whole of this part is made of native Sylavethy granite finely axed.

On the centre, between the three basins, is erected a neatly-designed delivery urn of polished Peterhead granite, the water



from which rushes out from devices of cast bronze lions' heads into the basins, and from thence flows through the buttress into the troughs. At the west side is constructed a self-shutting tap for drawing water into pails for household or other general purposes. Springing from the basin-level at each corner and alongside the urn are four columns, having bases and capitals of Sylavethy granite, while the shafts are of polished Peterhead granite. On the tops of these is surmounted a massive block of Sylavethy stone, cut with richly-moulded arches, forming a groin arch above the centre of the urn; immediately above this is the cornice, the frieze of which is of polished Peterhe granite, filled in with an incision of ivy foliage.

From the top of the cornice, the structure diminish towards the finial in a spirelet form, from the sloping sides which are constructed the inscription panels. These panels a encased on each side with Peterhead polished granite colum On the east panel is the "Haughton crest," cut in *alto rilie* the centre figure of which is a circular human face, represent the rising sun emerging above a cloud, the radiations of wh are polished. On the lower end of the panel are two reclini twigs of Scotch fir, which is the badge of the Haught Farquharsons. Over the top of the radiation is the wo "Illumino," cut in raised letters, in a raised band terminating ribbon dangles, while on the key of the arch above is cut t deceased gentleman's monogram, in raised letters, gracefu entwined. The panels are of polished Corennie granite, wi gilded edges. The north panel contains the following inscri tion in gilded letters.

This fountain is a testimony of respect and regard
To the memory of
ROBERT FRANCIS OGILVY FARQUHARSON,
Esquire of Haughton,
Who died May 3, in his 67th year.

On the south panel is a further inscription, viz.:—

Erected by his tenantry, feuars and friends, as a token of the estee and affection in which he was held, for the active and generous intere he took for many years in promoting the prosperity of his native vale

While on the east panel are the words—

Built in 1891.

On the top of the panels is a moulded pediment with intrica cuttings, which also continues the formation of the spirele The railing mouldings instead of meeting at the apex a returned inward to the main surface, leaving neatly forme cavities, into each of which is inserted a moulded finale tippe with a polished red granite ball. The surfaces above the ped ment are formed with sunk panellings. The shank of the mai finale is octagonal, richly moulded, having a large spheric ball of polished Peterhead granite, with moulded band roun centre surmounted with a neat terminal. The entire height i 18 feet.

The contractor for the granite work is the firm of Messr James Wright & Sons, Royal Granite Works, Aberdeen, wh are now proceeding with the erection at Alford.

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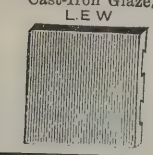
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REGISTRATION OF PLUMBERS.

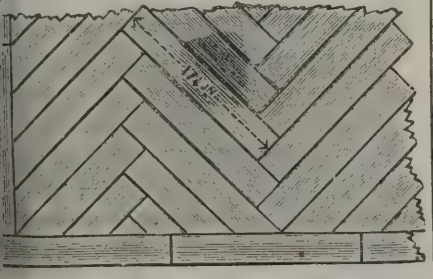
ANOTHER examination of candidates for registration by the Worshipful Company of Plumbers has been held at the Finsbury Institute. There was a very large attendance of applicants from Northamptonshire, Oxfordshire, Norfolk, Shropshire, Hampshire, Cambridgeshire and Suffolk, as well as from various parts of London and the home counties. The examination, while not being unduly severe, was such as to thoroughly test the knowledge of the applicants in the theory and practice of sanitary plumbing. The examiners were Messrs. C. Hudson, C. T. Millis, J. C. Ashdown, G. Taylor, W. B. Davis and L. F. Gilbert, the last representing the United Operative Plumbers' Association of Great Britain and Ireland. Exactly half of the candidates succeeded in passing the full examinations.

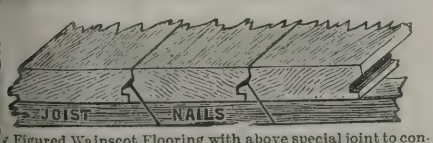
A meeting of the members of the Hull District Council for the National Registration of Plumbers was held in the Mechanics' Institute, Hull, on the 9th inst., the president (Alderman Sherburn, J.P.) in the chair. Amongst those present were Mr. W. R. E. Coles (secretary to the Worshipful Company of Plumbers, London), Alderman Fraser, Councillor Holder, the Rev. Dr. Lambert, Dr. Mason (medical officer of health), Messrs. R. H. B. Nicholson, F. S. Brodrick, J. Bilson, J. Whitfield, F. Wells, R.P., Buckle, R.P., Kenningham, R.P., Hirst, R.P., Hodgson, R.P., Storey, R.P., Harrison, R.P., C. W. Livington (inspector of nuisances), and J. B. Chapman (hon. secretary). The Chairman said he sincerely trusted that the Council would press on with a fixed determination—primarily, to watch over the inhabitants of the town and district, and, secondly, to raise to the very highest level everything connected with the plumbing trade. Dr. Lambert said they would probably know there was a considerable sum of money in the hands of the Corporation for the promotion of technical education, but they (the members of the School Board) had not yet been able to persuade the Corporation that they could make a good use of any of it. Mr. Coles said that the chief object he had in visiting Hull was to intimate that his company were desirous of co-operating with the Council, so far as possible, in the carrying out of plumbing classes in the most efficient way the Council could suggest. The London company were prepared to provide one-half of the amount, if the master plumbers and other members of the craft in Hull would provide the other half. He thought that if the local masters contributed, it would secure a greater local interest in such classes. In the proposed council, enacted in the Bill to be put before Parliament next year, it was intended that all existing organisations, along with some of the medical and educational bodies whose co-operation would be helpful, should co-operate for the carrying forward of the movement. The chief function of such a council would be to determine the qualification which should be imposed from time to time upon the plumbers registered under the system; secondly, they would have to hold, when necessary, inquiries into charges that might be made against a registered plumber. Other gentlemen having spoken, Mr. Wells moved the following resolution:—"That this meeting of master and operative plumbers, sanitary authorities, architects and others of Hull and district, desire to record its opinion that the time has now arrived when it is essential to the protection and preservation of the public health that the system of registration of plumbers which has been established by the Worshipful Company of Plumbers, with the co-operation of various local representatives of the plumbers' craft and the sanitary authorities, should receive the statutory powers which are necessary to secure the efficiency of the system." Mr. Hirst having seconded this, it was carried unanimously. Copies of the foregoing resolution were ordered to be sent to the borough and county Members of Parliament and the Worshipful Company of Plumbers.

A lecture on "Sanitary Plumbing" has been given at the Town Hall, Swansea, under the auspices of the District Council for the National Registration of Plumbers, by Mr. Perry, R.P.C., secretary to the Bristol District Council, and teacher of the plumbing classes at Bristol. The Mayor, Mr. Alderman Mason, occupied the chair, and among those present were Messrs. W. R. E. Coles, clerk to the Worshipful Company of Plumbers, London; G. Bell, borough surveyor, Dr. Davies, medical officer of health; Dr. Morgan, chairman of the School Board; T. P. Martin, architect and chairman of District Council: Councillor W. H. Spring; S. Reid, the secretary of the District Council; and a good attendance of masters and operative plumbers of the district. The Mayor, in introducing the lecturer, spoke favourably of the registration movement and its objects, and he then called upon Mr. Perry, who went fully into the question of sanitary plumbing, and explained by means of diagrams many of the mistakes commonly met with, which, had the plumber been properly trained, would never have occurred, and many lives would have been saved. To avoid these mistakes technical classes are held in many towns,

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including Swansea, with great success in all cases. Mr. Perry showed the audience, by the use of a glass model, the necessity of ventilating all soil-pipes in houses. This model was in every respect a very interesting and remarkable piece of work. Several questions were then asked by plumbers present, which were answered by Mr. Perry. Mr. Coles said he was very pleased to see that classes were commencing at Swansea for the higher training of plumbers, and he hoped that in the next session of Parliament powers would be obtained to protect the plumbing trade. Dr. Morgan asked on behalf of the plumbers present for copies of the diagrams which had been shown, and expressed his great admiration of Mr. Perry's model. The Mayor, after the close of the meeting, promised to present some books on sanitary plumbing for the use of the Swansea plumbers, hoping that it would be the nucleus of a plumbers library in this town.

At Gordon's College, Aberdeen, Dr. Farquharson, M.P., presented the prizes awarded by the Worshipful Company of Plumbers, London, upon the recommendation of the judges appointed by the District Council for Aberdeenshire, Kincardineshire and Banffshire, in connection with the National Registration of Plumbers. There was a large attendance of the trade. Dr. Matthew Hay (Aberdeen University), president of the District Council, presided, and along with him on the platform there were, besides Dr. Farquharson, Mr. Esslemont, M.P.; Mr. Coles, secretary of the Worshipful Company of Plumbers, London; Mr. Wilson, architect; Mr. Simpson, teacher; and Mr. A. M. Byres, C.A., hon. secretary. Dr. Matthew Hay, in introducing Dr. Farquharson, made allusion to the assistance which had been given to the work by the governors of Gordon's College in providing accommodation for the practical class, and expressed his pleasure in seeing that, although there were to be certain changes, they would still be accommodated. They were trying, in a small way it was true, to create a school of technical education in Aberdeen, and so far they had profited by their labours. Not only had the Worshipful Company of Plumbers in London provided them with those beautiful prizes, but they had promised to make a contribution towards the cost of the classes. Dr. Farquharson then presented the prizes, after which he said that though that was his first appearance before a company of Aberdeen plumbers, he thought it was rather appropriate, because he was a plumber himself, though not in their sense of the word, and he would hardly like to have the responsibility of having to make good a defective pipe or drain, or such like. He had, however, had the honour of being elected into the Worshipful Company of London Plumbers, and he had the further honour of holding a seat in the court of that body. He was bound to say he congratulated the prize-winners, but he had never brought himself to commiserate those who had not succeeded, because he thought that they learned a good deal in the attempt. They had passed through an examination, and they were now able to take stock of their knowledge. He was never a prize-getter, but he was occasionally a prize-tryer, and he was sure he was none the worse for having tried to get them. He would say that the subjects in which he competed for prizes were those which he found were most deeply engraven on his memory, and were still subjects of greater interest to him than any of those subjects in which he had never tried to get prizes at all. He then went on to refer to the system of registration of the Worshipful Company of Plumbers. The system was not so complete as they would like, because powers had not yet been obtained to take legal proceedings against those who unjustly and illegally assumed the title "Registered Plumber." The object was not to make it compulsory on every one to become registered before being allowed to exercise the plumbers' craft. What was wanted was to give a certain qualification to plumbers which might be known by the public, the assumption of which unjustly might be made matter of legal comment and legal punishment, which he considered was only right and proper. To do something in Parliament from the hygienic point of view had always been his ideal in political life. On this occasion, being a plumber and a member of a scientific profession, he had felt it a duty, as well as a pleasure, to come there and say these few words in hearty congratulation of their earnest endeavours to do the best for themselves in the profession which they had chosen. Their work was of the highest importance, and from a hygienic point of view was becoming daily more so. County Councils had sanitary departments, medical officers of health, and sanitary inspectors in town and country, and they were working up to a very high standard. Plumbers' work would become much more extensive in the future, but it could not become more responsible. Under our modern system of drainage every house has been turned into a great reservoir, and if anything were wrong with the pipes and drains, fevers and other terrible calamities, which are included under the all-embracing name bacillus, ensued. To them was handed over the duty of keeping this terrible scourge out of their houses. Their work was not one that was seen, as was that of the architect. Very much of it was done under-

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